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EDITORIAL COMMUNICATION

The objective of the special issue of **Bioscience Biotechnology Research Communications Vol 13 No (10) 2020 on "Recent Research on Management, Sciences and Technology**" is to provide a platform to researchers where they are able to publish their original research work in different avid areas related to Management, Sciences and Technology.

We are happy to share that quality research work addressing important issues like Psychological Wellbeing among Secondary Teachers, Women and Gender Bias, Women Empowerment, Hygiene and Safety in the Era of COVID-19 Pandemic etc. are published in this special issue. This Special issue also has articles related to Leadership effect, Supply Chain Management, E-Learning, ICT and Social Media Marketing. Articles related to applied science and technology in various areas of artificial intelligence, software applications, energy management have also been published in this issue.

This special issue aims to foster the growth of a new research community, acting as an international forum for researchers and practitioners in academia and industry to present research that will definitely play a very important role in changing the landscape of our near future.

The published research articles have been aimed to motivate the next generation researchers working in various emerging research areas. The articles published in this issue will be helpful for the researchers working in these new emerging areas. We express our heartfelt gratitude to all the contributors from different colleges and universities of India and Abroad for giving us an opportunity to publish their research work in this Special Issue on Recent Research on Management, Sciences and Technology.

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Power Estimation Using Linear and Logistic Regression

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ABSTRACT

It is tedious to make the process of finding the power for given inputs, outputs and the number of gates because it relies on the compilation of the HDL code (Verilog or VHDL) and it is difficult to carry out the power estimation in simulation as well. In order to get a faster and quicker way, power estimation can be done in machine learning. Here, it is achieved by taking the ISCAS Benchmark circuits for training the system and it is tested with random circuits for the estimation and it is compared with the power estimation taken from the power analyzer tool. The process is tested in different algorithms and regressions and it is compared. The detailed analysis result of ISCAS Benchmark circuits is taken to train the model. Then the model is applied for the estimation of the power. The Neural Networks Prediction is made possible for effective Error Rate and Run Rate.

KEY WORDS: KNN, BENCHMARK CIRCUITS, BPNN, MACHINE LEARNING, POWER ANALYZER CIRCUIT.

INTRODUCTION

Power calculation of VLSI circuits in traditional methods in more complicated circuits is more complicated. And the Power calculation technique is always a trade-off between time and precision. Simulation-based calculation of power provided the most reliable yet time-consuming performance. Here, VLSI power calculated in Monte-Carlo and other statistical approaches is less dependent on simulation and with less time obtained accurate performance. The Monte-Carlo methods or experiments in Monte-Carlo are a wide variety of computational algorithms focused on repeated random sampling for numerical results. The underlying principle is to use randomness to solve problems that could be solved in

theory. The whole point of the power estimation is not just through the input, output or number of gates but also depends on the pattern generation or the test patterns obtained from the source.

Test manufacturing is a vital part of the growth and advancement of the chip process. It would probably discover faulty equipment and sort them out. A test set shall be prefabricated and applied to every chip produced. The on-chip structures are actively used to guarantee quick and low-cost research, which creates unsustainable operating conditions. The chip's power efficiency is firmly regulated through the control functions to meet the stringent power requirements. In this case poor working conditions, such as those used to hit the power limit during the test process. This could result in incorrect test results and even damage to the chips. Tests must therefore be reviewed in advance to ensure that they meet the power criteria for ensuring the protection of test data. Another related issue is the IR-drop which can cause breaches of timing.

Exact simulation techniques must be implemented prior to the tape-out process to achieve true results at the sign-off point. Nonetheless, a few cycles should take the right steps

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to reduce the IR decrease of each case independently. Exact power and timing simulations, sadly, require substantial resources and more run-time. In addition, the analyzes must be conducted in a later stage of the production phase near the tape-out phase.

Literature Survey: The related increase in chip density [1] and operating frequency has rendered power consumption a major concern in VLSI design. Modern microprocessors are very hot: the power PC chip of Motorola consumes 8.5 W, the Pentium chip of Intel consumes 16 W and the alpha chip of DEC consumes 30 W. Excessive power dissipation not only discourages their use in a portable setting for integrated circuits but also causes overheating, which degrades performance and decreases the chip life. High-power chips require complicated and costly packaging and sinking heat to control their temperature levels. This, combined with the recent growing demand for portable low-power communications and computing systems, has generated the need to reduce power consumption in many chip designs. Nonetheless, the Semi-Conductor Industry Association has defined low-power design techniques as a critical technological necessity."

Managing the power of an IC network [2] adds to a growing list of problems facing both IC designers and network managers. Computer aided design (CAD) tools are needed to help with the tasks of power management. CAD tools are especially needed to estimate power dissipation during the design process in order to achieve power requirements without costly redesign. The chip components (gates, cells) only draw power supply in CMOS and BiCMOS technologies during a logical transition (if we ignore the minor leakage current); while this is considered an attractive low-power function of these technologies, it is highly dependent on the switching activity within these circuits. Quite clearly, the more power a more active circuit consumes. This makes the Manuscript obtained 31 August 1994 difficult. The author is Structured Research Laboratory, University, with IEEE Log Number 9406369. Illinois Urbana-Champaign, Urbana, US IL 61801. The problem of power estimation because the power is a moving target-it depends on the input pattern."

This pattern-dependence problem [3] therefore seriously complicates the easy and straightforward solution of estimating power using a simulator. Input signals are usually unknown during the design process because they depend on the system (or module) in which the module (or functional block) is ultimately used. Additionally, it is nearly impossible to quantify power by simulating the circuit for all" possible inputs. Several techniques have recently been proposed to resolve this problem by using probabilities to classify the set of all possible logical signals and then measure the strength of all those signals. This formulation achieves some degree of pattern-independence which helps one to efficiently estimate and manage power dissipation."

The earliest proposed techniques [4] to estimate power dissipation were based on circuit simulation which was highly pattern-dependent. One can simulate the circuit where the supply voltage and current waveforms are regulated, which is then used to calculate the mean power. Such techniques are not only highly dependent on trends but also too slow to be used on large circuits where high power dissipation is a issue.

Many advanced methods have been suggested to overcome [5] the limitations of simulation-based techniques, concentrating, as described above, on combinational digital CMOS circuits embedded in a synchronous design environment. The main problem regarding the power consumed in a combination circuit whose inputs are synchronized. The use of the probabilities was first suggested for capability estimation in 1191. In this analysis, a zero-delay model was assumed, and a temporary independence assumption was made so that the probabilities of shift could be determined using the signal probabilities. The signal probabilities at the primary inputs provided by the user are propagated to the circuit, taking into account the spatial independence, and the power was measured. The toggle control was ignored, as a zero-delay model was used. A probabilistic power estimation method, called probabilistic simulation, which measures the toggle power and does not allow the assumptions of zero delay or temporal independence. Within this technique, the use of probabilities has been expanded to allow specification of probability waveforms. This approach presumed spatial independence, and was not restricted to only synchronous circuits."

This also provided an algorithm to propagate the transition [6] density into the circuit. This approach does not presume zero delay, it just allows for the presumption of spatial freedom. Nevertheless, this assumption of independence has the effect of making the measured density values insensitive to internal circuit delays. A further probabilistic approach was proposed in which binary decision diagrams (BDD's) were used to take into account internal node correlations and switching power, at the cost of increased computation. This approach can become computationally costly, particularly for circuits where the power to switch dominates. We refer to the above methods as probabilistic, because probabilistic" "information is directly propagated into the circuit.

To do so, special models must be developed for circuit blocks (gates) and stored in the cell library. Other methods do not, by comparison, require sophisticated circuit models, which we will call statistical. Instead, they use traditional simulation models and simulate the circuit for a small number of randomly generated input vectors while controlling the power. These vectors are generated from probabilistic knowledge about user-defined circuit inputs. Using statistical estimation techniques, it is possible to determine when to stop the simulation so that a certain specified error is bound and illustrated below. All probabilistic and statistical approaches referred to above are for combinational circuits only. We

demand that the user define the latch outputs operation information. Power estimation in sequential circuits.

Regressions In Machine Learning: Regressions are set of algorithms or formula which can be implemented in calculating any form of quantity like power estimation, area measurement, etc. In simple words it is basically a method of modelling the targeted values based on some predictors. The predictors are mostly independent in nature. This method is used for comparing between two dependent or independent variables to either forecast or to find out the cause and effect between the two variables. These techniques usually differ on what type of regression variables we use and the number of variables we use. The simplest Regression is Linear Regression. The simplest Linear regression is finding out whether the independent variable (for instance x) and the dependent variable (for instance y) has a linear relationship if it is plotted in a graph. The most familiar type of graph is linear graph in any mathematical graphs. The simplest formula of the linear regression is the equation which is mentioned below. The equation has an independent variable which mostly a constant and the other on is a dependent variable.

$$y = a\_0 + a\_1 * x$$

To plot the equation with selected values it may be approached with the values mentioning in the blue dots for the values and the red line as the linear regression graph. The behind the scenes of this regression which is hidden for any programmer from the front end is basically two main parameters. These parameters make us understand the concept of linear regression in way more in depth.

Figure 1: Simple representation of linear regression
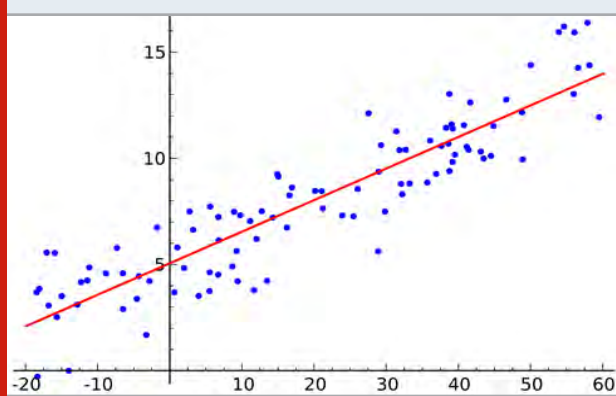
Logistic Regression: Alongside of the linear regression, the second most used regression is logistic regression. Though it is named as logistic regression, it mainly focus on the classification algorithm which is used to differentiate the input data in to its classes. The main difference of this regression from the linear regression is the term called "multi-class classification". The binary-class classification cannot classify more than two distinct classifiers.

Figure 2: Flow chart representing methodology
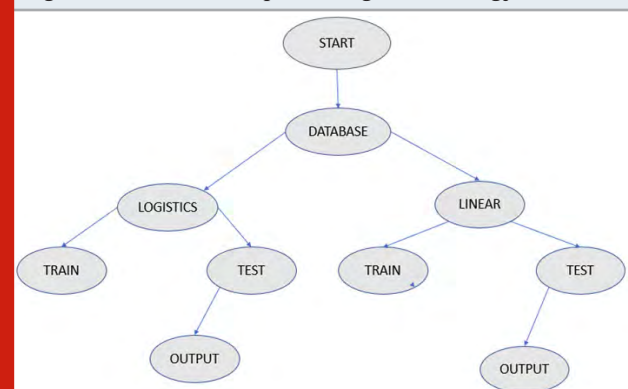
Table 1. ISCAS Benchmark circuits

					ISCAS'85					
List Of Circuits	Inputs	Outputs	Total Gates Used	Nand	And	Nor	Xor	Not	Or	Power
c17	5	2	6	6	NIL	NIL	NIL	NIL	NIL	0.00698
c432	36	7	236	79	7	19	18	40	NIL	0.00912
c499	41	32	256	NIL	56	NIL	104	40	2	0.01856
c880	60	26	437	87	117	61	NIL	63	29	0.0162
c1355	41	32	768	416	472	NIL	NIL	72	2	0.01065
c1908	33	25	995	377	63	1	NIL	277	NIL	0.00903
c2670	233	140	1244	254	333	12	NIL	321	77	0.01172
c3540	50	22	1821	298	498	68	NIL	490	92	0.03743
c5315	178	123	2830	454	716	27	NIL	581	214	0.02831
c6288	32	32	3840	NIL	256	NIL	NIL	32	2128	0.01292
c7552	207	108	3833	1028	776	54	NIL	876	244	0.02458

In this regression, the model approach is numerical values but the values are corresponded to the probabilities of the data given in the input which belongs to a particular class. The name "logistic" in the logistic regression justifies the another function to the weighted sum of the data given in the input and the model with which the parameters depend on. This function can be defined as "sigmoid function"The sigmoid function has the output values between 0 or 1 by mapping the values in a particular range and calculating the probabilities of the data given in the input from the given class. The function of the sigmoid is

$$Sigmoid(x)=1/(1+e-x)$$

Figure 3: Snippet code for the project

Figure 4: Estimated power graph
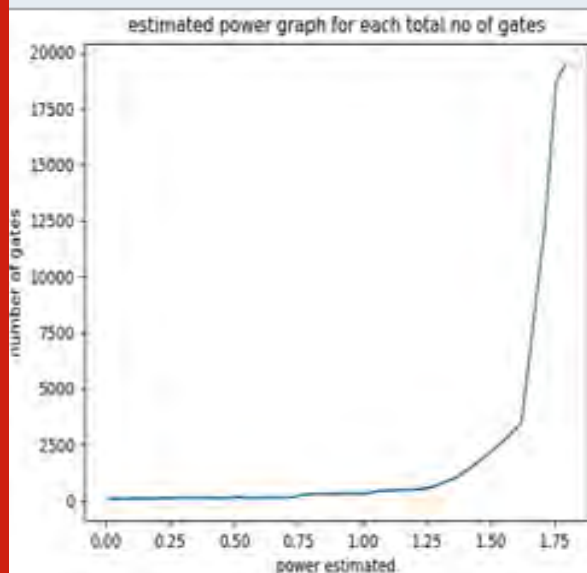
Flowchart Representation: The flowchart of this power estimation defines two important regressions (linear and logistic regression). The databases are collected from the ISCAS BENCHMARK circuits and collected in a ".csv" file. The sample data set is given below. The sample data given below does formed with the Monte Carlo method. This data is separated into two different datasets for each regression. This datasets in (.csv)excel file is taken as a training datasets in the process. Both logistic and the linear regressions are trained using this Monte Carlo dataset with the help of python software by the required library files. Then this whole process is now tested with the random circuits by giving a functional unit example (i.e) giving number of inputs, number of outputs, and the number of gates.

CONCLUSION

We have presented a power estimation approach to predict the estimation complexity of multiple inputs and outputs in a functional unit. This helps the floor plan engineer to predict the power after the production of IC chips but before the testing. Based on Mante-Carlo Method, we collected the data set which includes as number of inputs, number o of outputs and number o of gates in a particular circuit which is trained by two regression namely, linear and logistic. Thus, the experimental result shows the estimated of the ISCAS benchmark circuits for the collected data sets. The advantage of this power estimation model is that it can be easily characterized and it also has a framework for the inputs and outputs. In addition, the simulation and the delay points are very feasible. The predicted capacitance is combined with the average estimation to get high level power estimation. Estimated power for the given dataset of ISCAS BENCHMARK circuits is shown below.

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A Study of Sustainable Components in Green IoT Architecture

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ABSTRACT

The IoT is capable of connecting zillion of devices together on a huge scale, and it will continue to grow in the following years. The existing system is an integration of sensors on connected network collecting data onto the cloud through networking devices making purely dynamic, self-adapting, context free intelligent decision without human intervention. Therefore, there is an increase in the power consumption, cell congestion, signaling storms, truck rolls, communication delays in mass deployment of IoT devices and implement new technologies. There are several techniques of improving the IoT system. This paper stress on the using the concept of Green ecosystem as one of the techniques for components in IoT to sustain a Green IoT architecture.

KEY WORDS: GREEN TECHNOLOGY, IOT ARCHITECTURE, GREEN IOT, GREEN RFID, GREEN WNS, GREEN FOG COMPUTATION, VIRTUALIZATION IN IOT, GREEN DATA CENTERS.

INTRODUCTION

As the human race has improved life in its various industry revolution, it has also cause mismanagements of our energy resources and global warming leading to a very grim picture of the planet unable to sustain human life. Saving Environment is the global concern our priority is to make world green and clean. Currently in the world of digital network communication. Enormous amount of data is transmitted and received over the world for doing business, education and social networks. The ideas of machine to machine communication without the intervention of humans has throught about the idea of IoT. IOT is the technology to support remote connectivity of everyday devices which sends and receives data and information through internet. This system is purely dynamic, self-configured, self-adapting , context free, integrated into a knowledge system to take intelligent decision automatically. All of which would consume power and use various energy resources for its working. Green IoT basically focuses on the energy, efficiency in the IoT principles. Green IoT is defined as the energy efficient ways in IoT either to reduce the green-house effect caused by existing applications or to eradicate the same in IoT itself. IoT system tasked with enabling a greener society.

Green Technology and It Features: Green technology is sustainable technology for environmental benefits, Sustainable chemistry, Environmental science and monitoring are few technological processes that protect the environment. Products are innovated modified to make it environmentally friendly are green products. Some of the properties like energy efficiency, recycling, health and safety concerns, renewable resources are some that must be maintained to making of a green product or technology [25].

Features To Attain Green Technology: It is seen that energy generation and consumption and managements have been the key features to sustain a green ecosystem. The usage of renewable energy production technologies like energy generated by wind turbines, bioreactors, Photovoltaics, recycling waste are safe and low cost on input resource. Using sustainable resources management practices in the categories of businesses, agriculture, society, environment, and personal life with electronic devices and gadgets will improve the usage of resource utilization. [26] Implementing eco- friendly practices like paperless environment, data warehousing and vitalization through cloud would improve green computing. The use of green accreditations with products, venders and partners like Energy Star.

Green Plus, EPEAT (Eco Labelling), American Consumer Council, Green Business Bureau would set up a criterion to improved green devices. [27]. For this change globally it would be necessary to assert global cooperation to attain good green practices. The UNEP Green Economy Initiative (GEI) is designed to assist governments in greening their economies by framing policies to reshaping and refocusing, decisions about investments and spending in various sectors like clean technologies, water services, renewable energies, transportation, waste management, buildings and agriculture and forests [28]. Government and international design policies and laws that would encourage the use of unrenewable resources and application of Green technology.

Ecofriendly Green Technologies: Green Technology has made progress in the innovation of harvesting renewable energy, waste managements and recycling, water purification, reduction in pollutants and emission of greenhouse gases in industry as well as in consumer product manufacturing that are energy efficient and multi-functional to make it ecofriendly.[37]. The wastewater treatment includes membrane filtration, nanotechnology, microbial fuel cells, implementing of biological treatments plants and wetland as natural treatment systems. It makes water drinkable or significantly. It reduces the existence of pollutants from being flushed into waterbodies like rivers, lakes and sea.

To elimination of industrial emissions industries such as chemical, petrochemical, medicine and drugs, automotive, etc. must stop their emissions so that they do not cause serious environmental damage. Experts and expert infrastructure are deployed in the treatment of emissions from industries. It can manage the air pollutants in industries and can significantly decrease and lessen the greenhouse effect.

For creating self-sufficient buildings, their constructions are designed to function by generating energy without the need of an external resources. For greater production the same surface of photovoltaic panels is included in a smart solar tracking system, thus utilizing the solar radiation to its maxima. Vertical gardens do not need watering routines as they are aligned with walls of the building structure.. They reduce the noise pollution that comes from the outside and inside, it isolates the high temperatures that causes climate change, resulting in savings in energy, heating and air conditioning. If this technology is implemented to farms, we can save a lot of water and take care of the fertile soil.

The steps in recycling and waste management include technologies like automated biowaste and food waste tracking systems, smart containers, and smart optical scanning can help in sorting mixed plastics, separating and disposing them. Managing solid waste must be a commitment of companies, individuals. others. Depolymerization, Gasification, Pyrolysis, Plasma Arc Gasification are few methods used generates energy from trash. Generating energy from the waves: The wave energy management unit equipments are semi submerged in the sea and are responsible for transforming the movement of the waves into electrical energy. Pelamis has capacity equal to 2.25 MW is generated which generates electricity to 1500 homes max. In harnessing solar energy the solar energy conversion uses high vacuum tube for hot water, photovoltaic collector to produce electricity, polypropylene collector for hot water, and solar streetlamps. These technologies aim to reduce dependence on energy from hydrocarbons and fossil fuels and prove alternate energy resource.

Use of Natural gas boilers is another alternative. Boilers which consume less fuel or renewable energy are called Green Boilers. Natural gas a fossil fuel in them. It gives out more water vapour, less carbon dioxide, less emission of greenhouse gases. Fossil fuel produces 204 grams of CO_2 per thermal kW/h. Therefore, natural gas boilers condense, recovers the heat from the water vapour coming out of the chimney, giving higher thermal yields with less air pollution.[30] The manufacturing of consumer products that are made of recyclable, nontoxic material, that use less packaging conserving energy and resources will not only create a new market but also cost-effective products, low maintenance, positive brand image and loyalty adhering to the need of a green environment.[36] Eco-friendly vehicles are designed to run on battery and eco-friendly fuel hence has no negatively effects on the environment, contributing to reduction of the polluting gases presence in the atmosphere like carbon dioxide (CO_2), nitrogen oxide (NOx), carbon monoxide (CO), unburned hydrocarbons and compounds of Sulphur dioxide and Lead.

IoT Architecture And Its Elements: In 1998 Kevin Ashton stated that the IoT's has the capability to alter the world, in a similar way as Internet did. The IoT is a seamless smart environment of sensors and devices linking up and servicing people anytime anywhere and anything through the internet medium. It has connected the smart embedded system to the internet. The main elements of Internet of things are sensing, communication, data processing, data consolidation and delivery of information. IoT gathering information as points of activity through sensors and sensing technology, communication that transmitting of information sensed by device level things to cloud based service for processing the it from the end user is consolidated from other IoT devices and resources. This information is delivered to end user from devices to devices in M2M or a simple transfer [31].

Table 1. The components and key technologies of the IoT with it 4 layer architecture.		
Layers	Components and key technologies	Key Technologies
Perception layers	Sensors, Actuators	RFID
Network Layer	ADC , Microcontrollers and SOC (Arduino and raspberry pi) connecting devices	Bluetooth, WiFi, Z-wave, Zigbee, LTE adv, NFC, 6LoWPAN Wireless Sensor Network
Middleware layer	Fog nodes Servers Big Data analytics	Context detection and processing with Service -based IoT middleware, Actor-based IoT middleware Cloud-based IoT middleware,
Application Layer	Schematic	Resource describing Framework, XML, Web orthogonal Language

The existing IoT infrastructure consists of hardware devices sensing, actuating, communication, services and management. Mass deployment of the "things" or devices would create inefficiencies and other insecurities. Defective IoT device can affect the performance and power consumption of the network of things. Some of the problem could be cell congestion which is local in the mobile network, disruptions of the signals in a wide area due to capacity of the provider core network, degradation in performance and quality in the IoT services due to delay in communication and outage. Due to which there a raise in the trunk rolls, increasing the cost of the time to solve the problem and maintenance in general. As there is a reduction of the life of the IoT device, it consumes more power due to wrong communication during error handling. Since the wireless network is assume a generalised profile of devices, it is necessary that it need to optimize the deployment of the IoT devices for better coverage. [37].

The manufacturing of IoT devices cadmium, lead, mercury and various toxic elements. The growing usage of electronic devices among within society has resulted in an unrestrained disposal of e-waste is grave threat to human health and environment. Making the entire network of "things" inclusive of the manufacturing of these devices, selection of the right component, deployment of components on network, and using different computing techniques for leveraging it to build a reducing carbon footprint, conserving resources, and promoting better techniques for energy usage. It is the reason for moving towards green IoT. [38].

Converting of Iot To Green IoT: Green IOT is the term used for collective technologies of IoT where in components gets recycled and reused number of times.[21]
- Usage of Green sensors
- Usage of green RFID tags
- Usage of different networking topology structure in WSN and protocol
- Usage of green fog computation
- Usage of visualization techniques Usage of green cloud computing

Table 2. The various sensors present in the IoT devices are:[3]	
Sensors	Power Usage
Temperature sensor	0.5mW–5mW
Pressure sensor	10mW–15mW
Proximity sensor	2.4W
Accelerometer	3mW
Infrared sensor	0.2W
Gyroscope sensor	0.817 W
Gas Sensors	500mW–800mW
Image Sensor	150mW
Optical sensors	1mW to 10 nW
Smoke sensor	0.1mW

Sensors: Sensors in IoT devices: IoT technology is used where we need to collect and transmit data without human intervention. This done with the of sensors.

The electronic and telecommunition industries have contributed to the development of green tags like TI Sensor Tag C2650 [35] uses low power of 0.24 mA and runs 10 sensor in 0.33 mA. The data rate 100 ms/sample and broadcast BLE is 5.5 mA. It supports Bluetooth, 6LoWPAN and ZigBee. They adhere to non-plastic , biodegradable, low power, renewable green properties of green technology certification.

Green RFID: RFID technology is used to identify, detect, and track objects with radio frequency signals. RFID is the combined term of RF and ID where RF refers to wireless communication technology. RFID Tagging is the number system done by wireless microchip, which has a power source and an antenna. It is used to energize and transmits data to RFID reader or interrogator. The reader changes the radio waves to utilizable form of data. The classification of the RFID systems is based on Frequency and Tags

1) On Frequency
i) Low Frequency (LF) RFID: These RFID systems operate in the 30 KHz - 300 KHz range, and can read ranges of upto 10 cm. It performs best in the presence of metal or liquids and a short read range is acceptable.

High Frequency (HF) RFID: HF systems operate in the 3 MHz to 30 MHz range and provide reading distances of 10 cm -1 m. Near Field Communication technology (NFC) is based on HF.

Table 3. Comparison of cloud and fog computation [34]		
Requirement attribute	Cloud Computing	Fog Computing
Latency	High	Low
Delay Jitter	High	Low
Location Of Service	Within Entire Internet	At the edge of the Local Network
Distance between client and server	Multiple Hops	One Hop
Security	Undefined	Can be defined
Attack on the data route	High Probability	Very Low Probability
Location awareness	No	Yes
Geo Distribution	Centralised	Distributed
Number of Server Nodes	Few	Very Large
Mobility	Limited	supported
Real Time Interaction	Supported	Supported
Last mile connectivity	Leased Line	Wireless

Ultra–High Frequency (UHF) RFID: These RFID systems have a range between 300 MHz and 3 GHz , offer read ranges up to 12 m. It has quick data transfer rates global standard and other applications where large volumes of tags are required.
2)On Tags.

i) Active RFID tags: Active RFID tags has a transmitter and battery power source onboard the tag. In some instances the magnitude read can extend upto 100 m. Active tags are larger, more expensive and equipped with sensors for the measuring and transmitting temperature, humidity, light, and shock/vibration. There are two variants of active tags. a) Transponders turn on reception of radio signal from a reader and transmit conserve data. This conservers battery life. b) Beacons transmits one signal at a pre-set time interval. This tag is used in RTLS.

ii) Passive RFID tags: Passive RFID is a solution where the tag receives a signal from the readers antenna, which power the tag and sends energy back to the reader It is called as tag backscatter. These tags are usually smaller, less expensive, more widely used and more flexible than active tags.

ii) Battery–Assisted Passive RFID tags: BAP tag is hybrid RFID tag that is semi-passive RFID systems, has a built-in power source in passive tag. The energy from power source is totally captured from the reader and is used to returns the signal, that improves magnitude of reading distance and data transmission. BAP tags do not have their built-in transmitters. [29].
3) Green RFID tags
The features of Green RFID tag

- Green RFID tags are manufactures with less amount of energy and are recyclable or compostable, thereby leaving less material behind.
- Their inlays will be subject to the manufactures Green tag label certification.
- To meet the standard of green technology, they must be plastic-free.[32] .
- A Green Tag has a green certification to NHF and UFC tags as it omits heavy metals and the adhesives.
- The chemical etching processes on tags are implemented to products and packaging which are be recycled.
- Recyclable or compostable paper are used in the substrate.
- Etching with chemical on aluminium antennas

is avoided , which makes the aluminium residues reusable once the tag is discarded.

- Minimal adhesive is used for chip bonding and printable antennas that are printed on cardboard, which is compostable or recyclable. [33]
- Reducing the sizes of RFID tags because recycling the tags is not easy An energy efficient technique is a frequency-doubling tag method implanting the tags directly to cards, both paper-based antennas and organic diodes provides a perfect green solution at very low cost of production .[4, 5, 6].
- Dynamic Framed Slotted ALOHA (DFSA), where Gen2 specifies its concrete application maximize its throughput and identify all tags , thus necessary to give the correct estimate of the interrogating tags as well as size of the subsequent frame.[7]
- EAFAS based algorithm is a solution that makes RFID adapt to energy-aware scenarios that meets the future need of energy efficiency with high throughput requirements in green IoT applications [8].

Green WNS: A WSN is a large network of nodes build of sensors that are spread and deployed across an area where local computations is preformed on information gathered from the other surroundings networks. Each node battery life are different and difficult to recharge batteries. The following measures are taken to attain a green WSN.

1. The IEEE 802.15.4 standard, covers the physical as well as MAC layers for low-power and low-bitrate communications.
2. The most efficient energy conserving operation is keeping the radio transceiver at low-power sleep mode when communication is not necessary. Hence giving an energy efficient duty cycle [9]
3. Radio optimization techniques (e.g., transmission power management, modulation optimization, cooperative communication, directional antennas, energy-efficient psychological feature radio (CR).
4. Energy efficient routing techniques like cluster architectures, energy as a routing metric, multipath The use of MAC protocol will reduce wastage of energy in WNS. It improves network lifetime. S-MAC variants like T-MAC and DSMAC are implemented without time synchronization. Usage of CDMA are adapted to change in the network. But as the network grows there are layered multi-hop network architecture in which network nodes has the same hop count to the nearest base station that are clustered into the same layer. Channel access is done by TDMA- based MAC protocol combined with CDMA or FDMA.[10]
5. Based on the table of comparison MAC Protocols is the main protocol performance better than the protocols. The PRIMA-RT has maximum energy consumption of 0.015 J/packet/node and maximum latency of 15 Seconds 0.015 J/packet/node is a good MAC protocols for green WSN.
6. In WNS cluster heads communicate with one another to forward data to the base station. Cluster

heads closer to the base station get overloaded with heavy relay traffic and tend to die early, ignoring uncovered areas of the network, causing network partition.[10]

7. A packet processing based on an event along with redundant data eradication can be used in data processing just before communicating data or information to cluster head or sink on network. The nodes generate data packets periodically that are reported to the destination through multi hop or single hop routes based on distance to the cluster head. This data reporting and routing schemes decreases the transmission loss with an increase in the network life time.[11]
8. viii) The ME-CBCCP (Minimum Energy Consumption Chain Based Algorithm) is used to reduce communication distance between all the objects to compensate the power consumption in the lower layers of the IoT framework and To minimize the energy consumption in this framework, the minimal energy consumption that chain objects transmission algorithm is proposed as a solution to the optimization problem.[12]

Green Fog Computation: In general, all the data form the WNS of the IoT is transmitted to the cloud, this has limited bandwidth which provides service. With fog computing, all the processing of data is done on devices located nearer to where the data is collected, rather than sending it to the cloud. Instead of routing all the data through a centralize data centre in cloud, data could be stored in local computers and storage devices. This give a quick response time, a reduction in network latency and traffic as well as supports the saving in the backbone bandwidth for achieving a better QoS. It helps in selecting of transmitted applicable data to the cloud. As traditional cloud architectures need smallest data to be transmitted to the central cloud via edge node devices for analysis and computation.

This can delay computation. Fog Computing permits the edge node devices to carry out data processing locally, latency reduction, cache data management for improving QoS, load balancing, local resource pooling and device management, dense geographical distribution with edge node analytics which results in an enhanced user experience. Following points refer to assert the need to use Green fog computing

- Decentralizing the infrastructure for computing in which data, compute, storage and applications
- Intelligence and processing is brought nearer to the data from where is created reduces communication time
- Fog computing reduces the needed bandwidth and the communication between sensors and the cloud and visa versa. This can reduce the negative effect on IoT performance.
- Provides data aggregation

Green IOT through Virtualization: Virtualization plays an vital role to manage resources environments and to addresses the limitations of resource in IoT. The SDN and

NFV are the two solutions that provide virtualization in communication [13].

Benefits of SDN include:

1. It allows network managers processes to manage, configure, secure with optimized network resources direct network programmability dynamically through direct network programming
2. It can monitor network-wide flow installations and traffic flow control through logically centralized nodes giving a global wide view of the network, hence it collects network intelligence
3. It maintains an independent open standard for vendor simplifying network operations and design.
4. Benefits of NFV includes:
5. It replaces dedicated hardware with commodity servers replaces.
6. It is able to host SDN applications like security functions, load balancing, data collection & analysis through deployment of on-demand virtual network functions (VNFs).
7. This enables and enhanced scalability & elasticity for deploying vendor independent commodities with reduced cost, optimizes computing, memory, storage, and networking capacity of network devices.
8. Benefits of SDN-based IoT
9. ISDN can make routing easy and efficiency, facilities high data transmission, good resource allocation and network management for the devices at the edge, with an increase in the user demands [14]
10. SDN solutions in an IoT environment resolves primitive network issues like heterogeneity, scalability and interoperability among IoT edge devices, inefficient and less dynamic service deployment, slow adjustments to
11. New services and network upgrade time consumption, and insufficient user experience guarantees with minimum bandwidth problems [15]
12. Different IoT architectures with SDN-based were suggested and commercial solutions such as AR2500 Series is agile IoT gateways can also be deployment
13. SDN based IoT architecture clearly separates the concern between services provided in the control plane, the data plane and management solution with secure

Green Cloud Computing: The green cloud computing is a technique to carry out green cloud data centre operations. These operations are classified as:

(a) virtualization of resource management (b) sustainability of energy that can be renewed including waste heat utilization, (c) resource scheduling with evolutionary algorithms [17]. Below are the green cloud computing work with IoT devices

1. The virtualization helps in consolidation and management of data center resources in cloud by using multiple backup techniques like resource snapshot and migration of resources [18]
2. A virtual resource residing on a 40% utilized server can be migrated to another 40% utilized server with the former operates is in low-power idle mode. [19]

3. The intra-data center Virtual Machine migration network cost can be reduced with placing related, talkative VMs in optimal closer server distance to limit their communications to a section of the network. [20]
4. Data compression and duplication techniques over distance networks minimizes the cost between inter-data centre virtual machines migration process [21]
5. Green Cloud data centres uses renewable energy resources that lead to zero greenhouse gas emissions. Sun and wind energy can be generated by on-site or off-site installations. [22]
6. For the integration of sustainable energy to cloud data centre hybrid power supplies are fully utilized with ATS, To match the power generation for dynamic real time data centre workload of the data centre the ATS is used to shift between renewable energy resources and grid. [23]
7. Green cloud data centres provide enormous opportunities for re-use of wasted heat in the cooling process. The heat generate from servers is accumulated in the vapour absorption-based cooling systems which has reversible heat pumps transferring thermal energy to cooler space. In cooler places, data centres can be co-located with residential buildings for centralized heating. [24]

Merits of using Green Computing: Considering the need to include Green in entire scope of IoT is observed that these measures will have benefits in the overall green computing. It lowers the energy consumption with the usage of non-toxic materials in its IoT equipment. This green equipment is low priced and will be effective economically uses for the future due to efficient consumption of resources. Hence designers plan to make future IoT devices more eco-friendly across its entire life span, from manufacture to recycling. Energy-intensive manufacturing of IoT parts can be minimized by making manufacturing process more energy efficient. The replacement of petroleum-filled plastic with bioplastics-plant-based polymers-require less oil and energy to produce electronic parts, the challenge here is to keep these bioplastic components cool so that electronics won't melt them.

Instead of having landfills for e-waste one can make use of the devices by upgrading and repairing in time to make processes and processing easier and cheaper. It can also save energy and materials needed for new innovations for modifying old ones. With various visual interface on the IoT that use up a large amount of power, displays can be replaced with green light displays made of OLEDs, or organic light-emitting diodes. Silver and Copper ca replace toxic material like lead. Making recycling of IoT devices could be expensive and time consuming, it is more effective by recycling parts separately with a option of reuse or resale. In the future all electronic devices and especially IoT components will reduces energy use just by replacing memory storage with solid-state that is a low wattage parts. [39].

CONCLUSION AND FUTURE SCOPE

From the study of the properties required for implementation green technology to the IoT there is a need to implements the green attribute at all the four levels of IoT architecture More study can be carried out in an effective way of harnessing the potential of fog computation to reduce the dependency on the cloud in the circumstance of data aggregation. Virtualization give a natural bourn ide to implement green resource management.

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Psychological Wellbeing Among Secondary Teachers: Role of Mindfulness And Burnout

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ABSTRACT

Teachers have been at the centre of attention in the present times. Not only do they teach, but also train, facilitate, mentor and guide the students towards their welfare. They play an important role in the lives of children. In addition to facilitating learning, teachers are the key agents of socialization, helping students reach their highest potential and develop into responsible citizens. But, over the past years, teaching has become increasingly stressful. Today, teaching is one of the most stressful occupations in India. Teacher's stress impacts their health and well-being, work attitudes (e.g. job satisfaction) and turnover. Not only that, teacher's stress is also linked to teaching performance and student academic outcomes. Numerous research studies have indicated towards such findings. High stress levels are causing teachers to leave their profession, which causes instability among students and the community.

In this highly stressful world, teachers need a well-balanced mind to perform well and encourage students to perform well academically. Mindfulness has been considered as a successful way of life and has been found to come to the rescue of many. The present study focuses on the role of mindfulness and burnout on the psychological wellbeing of secondary teachers in the schools of Mumbai. The study was conducted on a sample of 311 secondary school teachers. The study adopted the descriptive method of the correlational type. The results of data analysis exhibit that there is a high relationship between psychological wellbeing of teachers with mindfulness. Also, there is a moderate negative relationship of psychological wellbeing with burnout. Thus, higher the psychological wellbeing, higher will be the level of mindfulness and it is likely that the burnout of teachers will be lower. The study also ascertains the differences between psychological wellbeing, mindfulness and burnout among secondary teachers on the basis of their gender and teaching experience.

KEY WORDS: SECONDARY TEACHERS, PSYCHOLOGICAL WELLBEING, MINDFULNESS, BURNOUT.

INTRODUCTION

Teachers perform a wide range of functions, fulfil responsibilities and assume many different roles to support school and success of the students. These roles may be assigned formally or informally, the teachers may carry out these tasks alone or share with others, very often they are the ones who ensure the entire school is set to improve. "In one day, we not only teach, we manage behaviour, plan lessons, assess learning, counsel students, carry out first aid, reply to a long list of emails, write reports, tidy classrooms, create resources, mark books and create displays – the list is endless." (Teacher, 2013).

Teachers play an important part in the lives of children. In addition to facilitating learning, teachers are the key agents of socialization, helping students reach their highest potential and develop into responsible citizens. But, in the past few years, teaching has become one of the most stressful occupations in India. Teacher's stress impacts their health and well-being, work attitudes (e.g.

job satisfaction, commitment, efficacy) and turnover. Not only that, teacher's stress is also linked to teaching performance and student academic outcomes. (Tahir, 2011; Lambert & McCarthy, 2006). High stress levels are actually leading teachers to decide against work and that encourages them to leave their profession, ultimately causing instability among students and the community (Kyriacou, 1987).

So it is important to reduce such stress by mindfulness or stress management programmes. (Roeser, 2013). Mindfulness helps teachers develop coping and awareness skills and lead to reduced anxiety, depression, and improved health (Flook et al, 2013). Teachers who practice mindfulness can lessen their own stress level in a better way, prevent burnout and increase psychological wellbeing. (Beshai et al, 2016). A well-balanced mind of the teacher is the key to perform work without stress and promote academic growth among students. A teacher's mindfulness, psychological wellbeing and burnout has a significant impact on almost everything he/she does, on the way he/she engages in activities, deals with challenges and interacts with others. (Poulin et al, 2008)

Need of the Study: Psychological wellbeing and burnout have been ongoing challenges in the field of education. Burnout of teachers may be reduced by providing resources to increase their sense of personal efficacy and capability to manage stress. Reducing and managing stress is part of promoting a healthy classroom atmosphere. Mindfulness has been proposed as a type of professional development (Roeser, 2012), that can help teachers manage the demands of teaching. This may surely be able to alleviate stress and burnout and increase psychological wellbeing amongst them. Overall wellness and happiness greatly depends upon the greater psychological wellbeing and reduced burnout levels. Mindfulness has been a well-researched topic and its relevance to healthy and happy living has been emphasized time and again. (Grossman et al, 2004; Murphy et al, 2012). It has been seen as a quality that can change the entire course of life of an individual. (Hülsheger et al, 2013). Given the stressful and challenging life of a teacher in the current times, it is of utmost importance and the need of the hour that the level of mindfulness, psychological wellbeing and burnout is assessed for teachers and attempts be made to improve their standard of life by taking appropriate steps.

When teachers exercise mindfulness, they not only get personal benefits such as reduced stress and better psychological wellbeing but their schools also do as well. (Hawkins, 2017; MacDonald & Shirley, 2009). It has been known through research that employees with high levels of psychological well-being and low level of burnout perform better at work than those with lower levels of psychological well-being and higher level of burnout. Hence it is extremely important to understand the mindfulness, psychological wellbeing and burnout in the teaching profession. Evaluating teacher's mindfulness, psychological wellbeing and burnout can be an effective method for understanding how each of these concepts affect each other and it is useful for schools as well as for teachers to improve their efficiency.

Mindfulness: Mindfulness is a receptive state of mind in which attention, informed by a sensitive awareness of what is occurring in the present, simply observes what is taking place. (Baer et al., 2006). According to Kabat-Zinn (1994), Mindfulness is described 'as paying attention in a particular way: on purpose, in the present moment and non-judgementally.'

Psychological Well–Being: Psychological Wellbeing has two important facets. The first refers to the extent to which people experience positive emotions and feelings of happiness. This aspect of psychological wellbeing is referred to as subjective wellbeing (Diener, 2000). Ryff (1989) had identified aspects that constitute wellbeing in his works: autonomy; environmental mastery; positive relationships with others; purpose in life; realisation of potential and self-acceptance.

Burnout: Burnout is 'a prolonged response to chronic emotional and interpersonal stressors on the job, and is defined by the three dimensions of exhaustion, cynicism, and inefficiency.' Exhaustion is the feeling of not being able to offer any more of oneself at an emotional level; cynicism is contemplated as a distant attitude towards work, the people being served by it and among colleagues; ineffectiveness is the feeling of not performing tasks adequately and of being incompetent at work. (Maslach et al., 2001).

Aim Of The Study: The study was conducted with the following broad aim. To study the mindfulness, psychological well-being and burnout among secondary school teachers working in schools affiliated to CBSE, SSC and ICSE boards in Mumbai.

Objectives Of The Study
1. To ascertain the relationship between mindfulness (FFMQ), psychological wellbeing (PWB) and burnout (BO) among secondary school teachers.
2. To ascertain the difference between PWB, Mindfulness and Burnout among secondary teachers on the basis of their

a) Gender
b) Teaching experience

Null Hypotheses of the Study
1. There is no significant relationship between mindfulness, psychological wellbeing (PWB) and burnout among secondary school teachers.
2. There is no significant gender difference between PWB, Mindfulness and Burnout among secondary school teachers.
3. There is no significant difference between PWB, Mindfulness and Burnout among secondary school teachers on the basis of their teaching experience.

Scope and Delimitations of the Study: The study included secondary schools situated in Greater Mumbai

affiliated to CBSE, ICSE and SSC boards. Only secondary teachers teaching in these schools were considered for the study.

Methodology of the Study: The descriptive survey method of the correlational type has been adopted in the present study.

Sample Size and Sampling Techniques: The study adopted a two-stage sampling technique for selecting the sample. At the first stage, secondary schools situated in South, North and central Mumbai were selected using stratified sampling technique. At the second stage, teachers were selected from these schools using simple random sampling technique. A total of 311 teachers were selected randomly from secondary schools from Mumbai region.

Data Collection Tools: As the data required for present study is from teachers of secondary schools, standardized rating scales were adopted as the data gathering instrument. Three tools were used to conduct a survey on secondary school teachers.

Five Facet Mindfulness Questionnaire (FFMQ): (Baer et al., 2008) is a 39 items instrument, based on a factor analytic study of five independently developed mindfulness questionnaires. The five facets are: Observing, Describing, Acting with awareness, Non-judging of inner experience, and Non-reactivity to inner experience. Items were rated on a 5-point metric of frequency (1 = almost never and 5 = almost always). A higher total score means a higher level of mindfulness.

Ryff's Psychological Well–Being Scales (PWB): The 42-item version of PWB scale was developed in 1989. The PWB scale incorporate six dimensions: autonomy, positive relations with others, environmental mastery, personal growth, purpose in life and self-acceptance. Respondents rate how strongly they agree or disagree with 42 statements using a 6-point scale (1 = strongly agree, 6 = strongly disagree).

Copenhagen Burnout Inventory (CBI) (Italian version) developed by Kristensen, Borritz, Villadsen, & Christensen (2005), evaluates the level of physical and psychological fatigue experienced by people with respect to personal, work-related, and client-related burnout. The three separate parts of the questionnaire are applied in different domains. The scales have high internal reliability and are widely used across the world for checking burnout levels.

Table 1.1. Correlation Coefficients of Pwb With Ffmq And Bo

	FFMQ	BO	PWB
FFMQ	1	-0.445	0.611
BO	-0.445	1	-0.455
PWB	0.611	-0.455	1

Data Analysis and Findings: The first null hypothesis was tested using multiple correlation. The following table shows the correlation coefficients of Mindfulness with Psychological Wellbeing and Burnout.

The correlation coefficient of Psychological Wellbeing with Mindfulness is 0.611 and with Burnout is -0.455. It is evident from the table that there is a significantly high relationship of Psychological Wellbeing with mindfulness. It means that if teachers are more mindful, their psychological wellbeing is definitely going to be high and vice versa. It is seen that there is a moderate negative and inverse correlation between Psychological Wellbeing and Burnout as well. The higher the level of Psychological Wellbeing, lower the level of burnout.

Since Mindfulness and psychological wellbeing are key personality traits for happy and contented teachers, it is important that psychological wellbeing be enhanced and burnout level be checked. The employer can ensure effectiveness in teaching by providing teachers with mindfulness based programmes that will bring down their anxiety, stress and burnout. (Shapiro, Brown & Biegel, 2007). It will also support psychological wellbeing. The following table shows the regression coefficients of the Psychological Wellbeing and Mindfulness and Burnout.

Table 1.2. Regression Coefficients of Psychological Wellbeing And Mindfulness And Burnout

	b	β	R	β x rxy	Variance
FFMQ	1.0378	0.5092	0.611	0.3109	31.09
BO	-0.4194	-0.2283	-0.455	0.1038	10.38
Multiple R2 = 0.4147 (p<0.0001)					
Multiple R = 0.6439					
Total Variance Explained = 41.47%					

Table 1.3. Relevant Statistics of the Ffmq, Pwb And Bo Scores of Male And Female Teachers

Variable	Group	N	Mean	t-ratio	p value
FFMQ	Female	245	128.71	1.4	0.16
	Male	66	126.19		
PWB	Female	245	182.03	2.22	0.03
	Male	66	173.95		
BO	Female	245	44.77	2.43	0.02
	Male	66	49.56		

From the preceding table, it is seen that the multiple R of PWB with Mindfulness and BO is 0.6439 which is significant at 0.0001 level. Hence the null hypothesis is rejected. This correlation is high in magnitude. The R2 of PWB with Mindfulness and BO was found to be 0.4147 which implies that 41.47% of the variance in PWB

is associated with Mindfulness (31.09%) and Burnout (10.38%).

II. The second hypothesis states that there is no significant gender difference between Mindfulness, PWB, Burnout among secondary school teachers. The following table shows the relevant statistics of the FFMQ, PWB and BO scores of male and female teachers.

1. From the above table it can be inferred that the p-value is 0.16 and the obtained t-ratio for gender difference in FFMQ of teachers is 1.4 which is not significant at 309 degree of freedom. Hence the null hypothesis that there is no significant gender difference in FFMQ of teachers is accepted.
2. It can be inferred that the p-value is 0.03 and the obtained t-ratio for gender difference in PWB of teachers is 2.22 which is significant at 309 degree of freedom. Hence the null hypothesis that there is no significant gender difference in PWB of teachers is rejected.
3. It can be inferred that the p-value is 0.02 and the obtained t-ratio for gender difference in BO of teachers is 2.43 which is significant at 309 degree of freedom. Hence the null hypothesis that there is no significant gender difference in BO of teachers is rejected.

Conclusion: There is no significant gender difference in mindfulness of teachers. This implies that male and female teachers do not differ in their level of mindfulness. However, there was a significant gender difference observed in the PWB and BO of teachers, that is, male and female teachers differ in their psychological wellbeing and burnout levels.

DISCUSSION

The findings show that there is no significant gender difference in mindfulness of teachers. It implies that both male and female teachers are equally mindful. This may be because males and females are exposed to similar environment within the schools. The influence of principal, administrative staff, resources available, relationship with colleagues and other factors do not seem to influence male and female teachers differently. The findings show that PWB of male and female teachers is found to differ. Psychological wellbeing of males and females in their place of work is significantly different. PWB of male teachers is slightly lower than that of female teachers. Females are more confident and positive than their male counterparts.

The findings also show that BO of male and female teachers is found to differ. Burnout of males and females in schools is significantly different. Female teachers get stressed faster and easier than their male counterparts. This may be for the reason that the female teachers have to carry out a lot more responsibilities at home along with that of the school. The third hypothesis states that there is no significant difference between PWB, Mindfulness and Burnout among secondary school teachers on the

basis of their teaching experience. The technique used to test this hypothesis was 'One–way ANOVA'. The groups that were formed on the basis of teaching experience of teachers were below 5 years of teaching experience, 5 to 15 years and above 15 years of teaching experience. The following table gives the analysis of variance of FFMQ on the basis of teaching experience of teachers.

Table 1.4. Analysis of Variance of Ffmq of Teachers on the Basis of Teaching Experience					
Sources of Variance	Sum of Squares	df	Mean Squares	F-ratio	p-value
Between Groups	533.31	2	266.66	1.6	0.203
Within Groups	51372.29	308	166.79		
Total	51870.62				

Interpretation and Conclusion: From the preceding table, it can be inferred that F-ratio for degree of freedom 2 and 308 is 1.6 and p-value is 0.203. The F-ratio is not significant and hence the null hypothesis that there is no significant difference in mindfulness of teachers on the basis of teaching experience is accepted. This implies that teachers below 5 years of teaching experience, 5 to 15 years and above 15 years of teaching experience do not differ in their level of mindfulness.

DISCUSSION

The findings show that there is no significant difference in mindfulness of teachers on the basis of their teaching experience. It implies that teachers who have less than 5 years, 5 to 15 years or more than 15 years of teaching experience do not have differences in mindfulness. This may be because of the fact that all employees are treated equally by the principal and the management. All teachers whether old or new in the institution follow work ethics and are governed by a clear and consistent set of values. They work hard to achieve 'win-win' solutions when disagreements occur between them. This may also be applied to the involvement of students in the daily proceedings of the school. This ensures mindful and happy teachers.

Table 1.5. Analysis Of Variance Of Pwb Of Teachers On The Basis Of Teaching Experience					
Sources of Variance	Sum of Squares	df	Mean Squares	F-ratio	p-value
Between Groups	13761.45	2	6880.73		
Within Groups	202971.74	308	658.99	10.44	<.0001
Total	215491.48	310			

The following table gives the analysis of variance of PWB on the basis of teaching experience of teachers.

Interpretation and Conclusion: From the preceding table, it can be inferred that F-ratio for degree of freedom 2

and 308 is 10.44 and p-value is <.0001. The F-ratio is significant and hence the null hypothesis that there is no significant difference in psychological wellbeing of teachers on the basis of teaching experience is rejected. This implies that teachers below 5 years of teaching experience, 5 to 15 years and above 15 years of teaching experience differ in their level of psychological wellbeing.

The post hoc Tukey HSD test on VassarStats suggested a significant difference in the PWB of teachers with below 5 years of teaching experience and above 15 years of teaching experience. There is also a significant difference between the PWB of teachers with 5 to 15 years of teaching experience and above 15 years of teaching experience. The noted p-value is less than 0.01. The mean score of PWB of teachers with below 5 years of teaching experience is 178.2326 whereas it is 189.94 for those above 15 years of teaching experience. This means that the psychological wellbeing of teachers with above 15 years of teaching experience is more than the teachers with below 5 years of teaching experience.

The post hoc Tukey HSD test on VassarStats also suggested a significant difference in the PWB of teachers with 5 to 15 years of teaching experience and above 15 years of teaching experience. The noted p-value is less than 0.01. The mean score of PWB of teachers with 5 to 15 years of teaching experience is 174 whereas it is 189.94 for those above 15 years of teaching experience. This means that the psychological wellbeing of teachers with above 15 years of teaching experience is also more than the teachers with below 5 to 15 years of teaching experience.

DISCUSSION

The findings show that there is a significant difference in psychological wellbeing of teachers on the basis of their teaching experience. It implies that teachers who have less than 5 years, 5 to 15 years or more than 15 years of teaching experience have differences in their psychological wellbeing. The teaches with above 15 years of teaching experience are highest on psychological wellbeing, may be because of the fact that their adjustment levels with the schools are higher than those who have spent lesser number of years with the school. This may also be because of the fact that they feel more comfortable with the kind of work they do at school and have attained mastery with all their portfolios during the time they have spent at the school. The following table gives the analysis of variance of BO on the basis of teaching experience of teachers.

Interpretation and Conclusion: From the preceding table, it can be inferred that F-ratio for degree of freedom 2 and 308 is 11.69 and p-value is <.0001. The F-ratio is significant and hence the null hypothesis that there is no significant difference in burnout of teachers on the basis of teaching experience is rejected. This implies that teachers below 5 years of teaching experience, 5 to 15 years and above 15 years of teaching experience differ in their level of burnout.

The post hoc Tukey HSD test on VassarStats suggested a significant difference in the BO of teachers with below 5 years of teaching experience and above 15 years of teaching experience. There is also a significant difference between the BO of teachers with 5 to 15 years of teaching experience and above 15 years of teaching experience. The noted p-value is less than 0.01. The mean score of BO of teachers with below 5 years of teaching experience is 46.75 whereas it is 40.37 for those above 15 years of teaching experience. This means that the burnout of teachers with above 15 years of teaching experience is less than the teachers with below 5 years of teaching experience.

The post hoc Tukey HSD test on VassarStats also suggested a significant difference in the BO of teachers with 5 to 15 years of teaching experience and above 15 years of teaching experience. The noted p-value is less than 0.01. The mean score of BO of teachers with 5 to 15 years of teaching experience is 49.63 whereas it is 40.37 for those above 15 years of teaching experience. This means that the burnout of teachers with above 15 years of teaching experience is also less than the teachers with below 5 to 15 years of teaching experience. So overall, the burnout level is least in teachers having more experience in teaching profession. However, teachers in the beginning of their career get more stressed and burnout in schools.

Table 1.6. Analysis Of Variance Of Bo Of Teachers On The Basis Of Teaching Experience

Sources of Variance	Sum of Squares	df	Mean Squares	F-ratio	p-value
Between Groups	4533.95	2	2266.97		
Within Groups	59716.39	308	193.88	11.69	<.0001
Total	63823.99	310			

DISCUSSION

The findings show that the teachers with above 15 years of teaching experience have least levels of burnout, may be because of the fact that their adjustment levels with the demands of schools are higher than those who have spent lesser number of years with the school. The work that is assigned to them is taken with ease and they are able to discharge their duties in a more professional manner than getting it on their nerves and worrying over them. They may also have attained mastery with all their portfolios during the time they have spent at the school leading to ease of work without any burnout.

CONCLUSION

Psychological Wellbeing of teachers is an important area of inquiry and must be studied for its improvement. Mindfulness wields positive effect on work engagement

(Glomb et al, 2011; Schultz et al, 2015) by enhancing positivity, hope, and optimism. Well-being is directly influenced by mindfulness (Poulin et al, 2008; Reb, Narayanan & Ho, 2015), and hence exerts additional indirect influence. This study throws light on the fact there is a close relationship between Psychological Wellbeing, Mindfulness and Burnout among teachers. The study suggests that if the Psychological Wellbeing of teachers is to be enhanced, it may be possible with the introduction of mindful practices. Mindfulness has the potential to alleviate stress and burnout through its various activities. This study could be an important groundwork for future studies based on similar themes.

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Women and Gender Bias: with Specific Reference to Women Cultivators and Farmers

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ABSTRACT

In midyear of 2019, Hon'ble Minister of Agriculture & Farmers Welfare, Shri Narendra Singh Tomar was asked about the 'Woman Farmer Certificate' which was proposed in Women Farmers' Entitlements Bill 2011. He brushed aside this question by just saying that now since the women farm workers have registered themselves as cultivators there is no need for providing them certificate of farmers. The farm landowners are called farmers. Others who are working on the farm land are called cultivators. This categorization has been done by the government to easily qualify the farmers to get the subsidies which are only for farmers. The cultivators on the other hand don't get any subsidy from the government. The women folk who are generally the wives of the farmers work on the field. They are not owners of land; they are called 'cultivators'. The women are working on the field as cultivator consist of 87% of the farmland workers. It means that all these populations are not going to get any subsidy from the government. In 2019 Oxfam India reported that these kinds of obstacles are working negatively towards the productivity of women folk. M.S. Swaminathan who was a famous scientist working on Agricultural Products understood the situation and presented a bill for women farmers called Women Farmers Entitlement Bill, 2011.

He is the same person who is famous for bringing in the Green Revolution in India. He proposed that the women farmers should get a certificate called 'Woman Farmer Certificate'. This would give the women farmers the smuch-required status of a farmer. After getting the status these women could avail the visibility of 'Kisan credit cards' which would very easily give them institutional credit. Because of the requirement of being farmers it is very easily available to men but not in the same manner to the women. In 2011 when the census was done, the data showed that 3.6 crore women were labelled as cultivators. That means that these many women were working on the field as farmers but were labelled as cultivators and thus had no access to the subsidies provided by the state. Since the land falls in the state list, the state has to make laws on it and unfortunately States have termed the workers working on field without any ownership of the land to be considered as cultivators. The paper looks into the implications of the women farmers categorized as cultivators for want of land owner category, with a case study of Maharashtra Agricultural and Land laws with special emphasis on the rights of women farmers v. cultivators and their current status as cultivators.

KEY WORDS: WOMEN CULTIVATORS, FARMERS, WOMEN FARMERS' ENTITLEMENTS BILL 2011, KISAN CREDIT CARDS, MAHARASHTRA.

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INTRODUCTION

India is an agriculture and farming based country. The Economy majorly relies on agricultural development and its produce. In recent times, there has been a decline in the production through agriculture, still India is considered to be an agriculture based economy. Most of the people's livelihood depends upon agriculture. The culture based economy produces the income to the capacity of being the second position holder in the world in terms of Agricultural production (Bala. N, 2010). Various kinds of Agricultural production which are done in India for example plantation crops, livestock, field crop, fruit crop, forestry. It is considered then the agricultural economy industry recruits around 52% of the workforce of the country (NSDA, 2018). As understood the Urban population is generally not associated with agricultural activity it majorly is shown in the rural population.

If we consider the GDP of our country, we can see a decline in the agricultural produce and the economic status of it but still it is one of the leading industries of the country because it is supporting the social economic intensity of India. The leading states it can be considered as agriculture place based states are Maharashtra West Bengal Bihar Haryana Andhra Pradesh Uttar Pradesh Madhya Pradesh and Punjab. it has also started giving the importance to the produce from agriculture not only from the economic aspect but also from the job perspective and international market. The government has started various schemes through its own policies as well as NGOs and also must private Agencies to invest in this particular industry. Technology has also started playing an important role in agricultural production. one can say that there has been a remarkable development in this field, but one thing has not changed even now. The women force who were working on the farmland are still considered to be low life and have not been given status of even farmers.

Problem Statement: In the past decade the sector has actually seen a major infusion of Science and technology brought from the developed nations. This particular change has actually increased the productivity of Agricultural produce. The farm labourers specially men are also being trained by the government to use the latest technology. The woman who actually consists of almost two third of the employment as farm labourers are still considered to be a helping hand rather than the major worker (Jai Kisan, 2018). They are still not considered as employed labourers. The women force is actually considered to be a housewife or the woman who are supposed to look after the family responsibilities and maintenance. The work which they do on the field is termed as family labour because it is considered as their secondary work apart from household chorus.

Apart from these there are other issues Attached with women for example they are mostly illiterate they are devoid of development they are mostly without employment and are ridden with poverty. Adding

insult to injury they are not even considered as issues for women, the initiative which is there for the rural population does not consider any of the issues mentioned above. This creates a kind of a divide among women workers and men farmers who are working on a similar platform but have been given a different card to play. the women soap generally have shown their potential in agricultural productivity economic vitality household food security family health and welfare.

If "invisible workers" consisting of women is considered it is believed that they comprise of around 45.5% of the labourer working in agricultural field but id they are removed it boils down to 38.5%. Therefore, it can be said that around 7% of the women workforce are not seen at all. The paper looks into this disparity with the specific instance on the female cultivators who are deemed to be farmers.

Literature Review: Martha A. Chen, (2009) talked about women's work in Indian agriculture in specific agro-ecologic zones. She discussed about how the meeting of needs of landless and land poor women is very difficult. Swarna S. Vepa, (2005), has discussed the feminisation of agriculture and marginalisation of their economic state. Bhim Reddy and Abhishek Shaw, (2013), have written a sarcastic comment on the land owners as 'New Landlords' and their non-capacity to work on farmland i.e., 'Too Poor to Farm' or 'Too Busy to Farm', Alka Parikh, Sarthi Acharya and Maithreyi Krishnaraj, (2014) Gender Budgeting Analysis: A Study in Maharashtra's Agriculture,

Research Questions
1. What is the participation of women workforce in agriculture sector across India and specifically in Maharashtra?
2. Whether there is a specific support given to farmers as against to cultivators?
3. What are the hardships felt by women cultivators in absence of farmer's certificate and will it be resolved with the procurement of the certificate?

Research Objectives
1. To get the clarity on participation of women workforce in agriculture sector across India and specifically in Maharashtra
2. To understand the specific support given to farmers as against to cultivators
3. To enquire about the hardships felt by women cultivators in absence of farmer's certificate and will it be resolved with the procurement of the certificate

METHODOLOGY

The study is a mix of doctrinal research and analysis of secondary empirical data regarding the plight of women farmers categorized as cultivators. The doctrinal research has been used to evaluate the relevance or effectiveness of laws, concepts, legal institutions or governmental policies. This methodology is essentially a library based

study. For the study, data was collected from both primary as well as secondary sources. The method used in such research involved the obtaining of information on a systematic basis and then examining and evaluating it in order to arrive at some conclusion.

Women Work Force in Agriculture: Women are considered to the support system rural scenario and platform. According to the 2011 Census, around three fourths of the population of females in India are from the family of farmers falling in the category of either small or even marginal. A substantial amount of them are also cultivators who work as labourers in someone else's agricultural land. (Census, 2011) The women in agriculture is an association which can be considered as an age-old practice. This age old practice is now being talked about on the parameters of economic scale. The gap is visible regarding the image and perception of actual labour and economic gain. If population is considered, they are to the tune of 50%. If number of hours are compared that are at 60% higher to men which means around one third, the time higher than what is required norm.

Still, they are only paid around 10% of what the men folks who are labourers are paid (Gupta, Monica, 1987). There are changes in perception though over the years. There is a sense of realization, although gradual, that women have an important role to play as part of development in agri field. Also, their contribution in the field of agriculture, food security, horticulture, processing, nutrition, sericulture, fisheries, and other allied sectors is not overlooked now. Interestingly the major work force actually working in the agricultural field are women. Especially in India. Women are not only involved in exercising labour from the perspective of output through physical means but also better in terms of quality and competence.

Women in India are working in the fields to produce agricultural outputs in various capacities. Their role is not defined specifically and therefore the contribution cannot be quantified in terms of number and degree. The data although cannot but in some states it becomes clear that women contribute to the tune of 60%-80% in production of food (Table 2). Another reason for the quantifying of the contribution of labour and produce by women in agricultural field is that in most agricultural households both men and women are involved in crop production. Attempts can be made to come to specific percentage for above issue by hypothetically categorizing one type of crop to be grown by women and other by their counterparts. After this they can be collated together and come to a conclusion on the input and output by women.

Table 1. Women Participation in Agricultural & Non – Agricultural Activities calibrated state wise (Source: Ghosh, Mun Mun, Ghosh, Arindam (May. 2014): 'Analysis of Women Participation in Indian Agriculture', IOSR Journal of Humanities and Social Science (IOSR-JHSS) Volume 19, Issue 5, Ver. IV PP 01-06).

State	Total Female Workers	Percent of Female workers in Agriculture	Percent of Female workers in Non-Agricultural Activities
Himachal Pradesh	630521	82.47	17.53
Manipur	229137	55.59	44.41
Nagaland	279166	82.66	17.34
Andhra Pradesh	9585381	73.44	26.56
Rajasthan	4595570	81.07	18.93
Madhya Pradesh	5046293	79.45	20.55
Karnataka	5467914	61.11	38.89
Tamil Nadu	7454473	59.30	40.70
Maharashtra	10331758	74.53	25.47
Gujarat	3544508	57.12	42.88
Orissa	1584529	60.47	39.53
Tripura	170238	52.78	47.22
Assam	1265065	42.47	57.53
Punjab	1409704	24.51	75.49
Bihar	3541857	83.56	16.44
West Bengal	3528612	32.62	67.38
Uttar Pradesh	4999389	65.87	34.13
Kerala	1776280	21.27	78.73

Government does not collect data in the form of contribution by women separately than men. Even if they try to collect, they could not do it easily because the work is not divided in clear terms for both men and women work force in the fields in equal capacity or sometimes one more than the other. Generally, they both work together if one of them is sowing the field, then the other one is taking out the weeds. If one of them is watering, the other one is planting the seeds. So they are working together. The gender disparity cannot be found out in this particular instance.

It is also not easy to clearly mark the work of both the genders. A study done by United Nations Organisation found out that almost all agricultural producing countries showed that women were producing more than 60 to 80% of the food production. It is well understood that women are major key players in the working in the farmland but it cannot be categorised with particular data. Although this is data provided by UNFAO, we can say that there is major contribution on the farm land by women (UNFAO, 2011). This particular data can vary in numbers from state to state, across the country. Taking into account the state, it is advised that the government comes up with a clear policies and provisions for women workforce on the feet tuition.

Women And Unpaid Job: Women are born with equal capacity to work as men. Society has characterized a certain definition for women and men which make them fall in certain brackets. This consecutively results in segregation of work accordingly for both genders. Generally, women are attributed to look after the children and elderly at home. Since they are staying at home for this purpose, they are also made responsible for looking towards raising of cattle and other animals which are small. There seems to be considerable change with time and various culture though. Although they are working but these jobs are unpaid as well as time consuming. In addition, they limit her to only those kinds of income earning business which can be done from home in addition to fulfilling her responsibility of household chores. They are abstained from getting involved in high income work which require minimum eight or more hours of work and some tie to get return. (Lanjouw, J.O. et al. 2001).

This characterization of work load according to gender is understandably a demarcation quite visible at the level of work force. The work load difference can be experienced across countries. According to 2001 World Development data, it is projected that women spent around 85-90% of the time on responsibilities at home like chorus and cooking apart from child care and looking after the needs of elderly, across a varied kind of countries (Fontana, M. et al. 2008). The rural women folk are generally married in a joint family. It means the above mentioned chorus is time intensive and tiring. Time-allocation studies have shown that women work significantly. As can be seen in Indian households, school going girl child also works and helps in house hold chores as compared to boys who generally attend schools, barring a few who

help in farms. Himachal Pradesh data shows that apart from other activities mentioned above, the care giving is also added to the time and energy consumed in work by girls, one can conclude that girls do far more work than men (Ilahi, N. 2000).

Figure 1: Women Participation in Agricultural & Non–Agricultural Activities calibrated state wise (Source: Ghosh, Mun Mun, Ghosh, Arindam (May. 2014): 'Analysis of Women Participation in Indian Agriculture', IOSR Journal of Humanities and Social Science (IOSR-JHSS) Volume 19, Issue 5, Ver. IV PP 01-06).
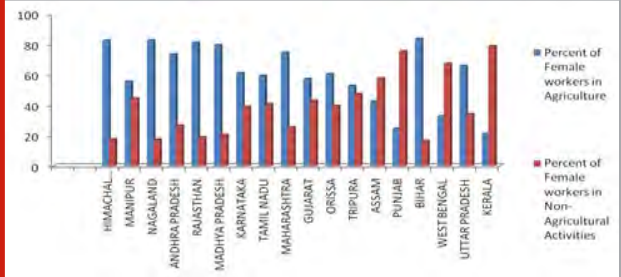
States which are having a growth rate intensified, are Nagaland, Himachal Pradesh and Rajasthan. Nagaland is only one of those states which shows highest CGR in case of both the gender of cultivators (Cheryl Doss, 2011).

Women Farm Workers In Maharashtra:
Development programmes in agriculture, implemented for more than 15 to 20 years and likely to continue in the foreseeable future, are the following: -
- Promotion of crop agriculture - in sorghum, maize, pulses, cotton, oilseeds, sugar cane, and rice; -
- Horticulture development; -
- Irrigation, and soil and water conservation; -
- Animal husbandry and dairying; -

Rural development - primarily anti-poverty programmes like the Integrated Rural Development Programme (IRDP) (and its later versions), Employment Guarantee Scheme (EGS), or dry area development schemes like the Drought Prone Area Programme (DPAP). Each of these is discussed here in brief. The crop programmes appear to be gender-blind since at no stage does gender find mention, except for one programme on promotion of women farmers in one district. But to an extent they could be conducive to benefiting women farmers in general, because they aim to upscale agriculture. Horticulture development will be developed only in small pockets. Nevertheless, it could benefit women farmers and labourers because it is labour intensive, particularly female- labour intensive. Women's engagement in kitchen gardens for vegetables does not however attract any policy interventions. Irrigation is a priority programme.

Seen in the gender perspective, irrigation is per se neutral, but due to its employment effects, it could benefit men and women workers through the labour demand route. In terms of a regional spread, there is a regional asymmetry emerging from water (non) availability both between

and within regions. Irrigated agriculture thus attracts migrant workers in a few locations. On the distribution of gains by gender, the following could be said: first, women labourers gain in incomes but relatively less compared to men, because of their restricted mobility; second, they might be burdened with extra responsibility when their spouses are away on work to distant locales; and third, irrigation projects are usually accompanied by land consolidation and intensification in casual labour work, and women get jobs at the lowest rung. Indirect effects of irrigation are occupational diversification, and women could gain if they have the requisite skills and wherewithal. Animal husbandry is an important anti-poverty as well as occupational diversification programme within the agricultural sector. However, most milk cooperatives in Maharashtra, unlike say in Gujarat, are bastions of male domination. Hence intensification of this a household but not necessarily women.

Table 2. Compound Growth Rate (CGR) of Indian Cultivators and Agricultural labourers (Source: Ghosh, Mun Mun, Ghosh, Arindam (May. 2014): 'Analysis of Women Participation in Indian Agriculture', IOSR Journal of Humanities and Social Science (IOSR-JHSS) Volume 19, Issue 5, Ver. IV PP 01-06).

States	Cultivators		Agricultural Labour	
	Male CGR	Female CGR	Male CGR	Female CGR
Andhra Pradesh	1.002	0.996	1.015	1.010
Kerala	0.989	0.973	1.007	1.039
Tamil Nadu	0.994	0.994	1.016	1.014
Karnataka	1.004	0.994	1.016	1.015
Gujrat	1.006	0.989	1.022	1.012
Maharashtra	1.005	1.000	1.013	1.056
Madhya Pradesh	1.001	0.987	1.015	1.011
Punjab	0.989	0.953	1.012	1.020
Uttar Pradesh	1.003	0.987	1.017	0.999
Rajasthan	1.008	1.003	1.021	1.016
Himachal Pradesh	1.011	1.008	1.025	1.019
Bihar	0.997	0.972	1.020	1.003
Orissa	0.999	0.980	1.013	1.015
West Bengal	1.001	0.992	1.019	1.018
Assam	1.000	0.981	1.024	1.040
Nagaland	1.019	1.016	1.037	1.026
Manipur	1.004	1.004	1.063	1.058
Tripura	1.000	0.990	1.030	1.050

The EGS, a state government sponsored programme was initiated from 1974-75. From 9th Five Year Plan (1997-2002) onwards, horticultural development, well digging on lands of small and marginal farmers, and other work on private lands have also been included within the ambit of EGS works. EGS has often been identified as a 'woman-friendly' programme; at least 50 per cent or more workers are women in any year. The programme is set up in such a way that most women workers find it not too difficult to work on it, even though the type of work is arduous.

For example, work is provided near the villages and there are facilities for child-care. Also, the work payment schedule is not weighed against women workers, and there is equal payment for equal work. EGS, above all, has helped in stabilization of the wage rate, which is so necessary for ensuring livelihood for all. A programme - the Maharashtra Rural Credit Programme (MRCP) - was experimented with between 1993-2002. This was an improved version of IRDP with a strong group-focus, women's participation, participation of the whole village, technical assistance, etc. Like IRDP, this programme continued to provide individual credit as well, along with lending to groups. Not only was it successful, it benefited women considerably (Acharya et al 2001). It is believed that SGSY has been established on the model of MRCP. SGSY aims to provide both individual and group focus in its implementation, it has a strong women's focus and also specially targets SC/ST communities.

It emphasizes the promotion of micro enterprises. DPAP aims to develop wastelands/degraded lands, promote the socio-economic status of people in these lands through employment generation, mitigate the adverse effects of diverse climatic conditions, and restore ecological balance and conserve natural resources. Watershed programmes are generally gender neutral. In the construction stage, however, there are a lot workers required; this creates employment, and women workers also participate in them extensively. Later, since there is an increase in productivity in the whole area, women

could again benefit from the distribution of gains. Ready availability of drinking water also partly reduces women's (unpaid) work burden. Some special schemes within community participation include forming self-help groups, SHG training, exposure tours, and so on, where women could be targeted beneficiaries. In its present form, however, the notion of joint ownership of land by both men and women, has not found place; consequently, all that which goes with land ownership - credit, skill formation, etc., for women - also get missed out in watershed programmes in rural Maharashtra.

Women Farmers' Entitlements Bill 2011: In 2011 when the census was done, the data showed that 3.6 crore women were labelled as cultivators. That means that these many women were working on the field as farmers but were labelled as cultivators and thus had no access to the subsidies provided by the state. Since the land falls in the state list, the state has to make laws on it and unfortunately States have termed the workers working on field without any ownership of the land to be considered as cultivators (Census, 2018). The farm landowners are called farmers. Others who are working on the farm land are called cultivators. This categorisation has been done by the government to easily qualify the farmers to get the subsidies which are only for farmers. The cultivators on the other hand don't get any subsidy from the government. The women folk who are generally the wives of the farmers work on the field. They are not owners of land and are called 'cultivators'. The women who are working on the field as cultivator consist of 87% of the farmland workers. It means that all these populations are not going to get any subsidy from the government. In 2019 Oxfam India reported that these kinds of obstacles are working negatively towards the productivity of women folk (Bedi, Bani 2018).

NDTV report worked on the plight of farmers in Andhra Pradesh. farmers had committed suicide in the state because of issues related to agriculture. The government in Andhra Pradesh was headed by Y S Rajasekhara Reddy. he had categorised the farmers as those who were owning the land and were working on it. These farmers were called genuine farmers. when they were committing suicide the government was acknowledging that as a farmer's suicide full stop so according to the government does suicide in 2012 was of 90 farmers. NDTV reported that it was more than three times of what the government was showing. as only 90 farmers were recognised by the government they were only compensated for this suicide. The others who are more than 180 in number were not compensated full stop; this compensation was given under the order of the government in 2004 called 'Go 421'.

NDTV also reported that these numbers which were not considered to be farmers had actually committed suicide because of agriculture related problems. more than half of them were women and they were not owning the land. This was actually unfortunate for them and their family because they were not compensated for the suicide. An appalling incident was of Sangishetty Yadaiah, who

was a farmer in Hyderabad. He had committed suicide because of agricultural issues and the lending of money for farmland. The Government and the reporter said that in place of her if you had died the family would have been compensated. This felt like a blow to that farmer because he had already lost his wife and now they were not compensating for this loss of his. Instead, they were saying that he should have died in place of her. He was reportedly given the answer that only farmers are to be compensated and not anyone, even though he is a cultivator working on the farm land.

Woman Farmer Certificate: M.S. Swaminathan who was a famous scientist working on Agricultural Products understood the situation and presented a bill for women farmers called Women Farmers Entitlement Bill, 2011. He is the same person who is famous for bringing in the Green Revolution in India. He proposed that the women farmers should get a certificate called 'Woman Farmer Certificate'. This would give the women farmers the much required status of a farmer. After getting the status these women could avail the visibility of 'Kisan credit cards' which would very easily give them institutional credit. Because of the requirement of being farmers it is very easily available to men but not in the same manner to the women. In an interview with The Wire, he cited "An identity card for women is useful for access to entitlements. The Kisan Credit Card for example requires land ownership title" (Bani Bedi 2018).

Social activist, Reema Nanavaty (SEWA 2019) is of the opinion that an i-card could assist womenfolk get right of entry to useful resource from the authorities for farming. When requested approximately the question presented inside the Lok Sabha, she uttered, "With the feminisation of agriculture, as men migrate for urban labour, the brunt of agricultural work is borne through women. While the 2011 Census record might also discover women cultivators, it does not deliver them the label of 'farmer'." The Census which took place in 2011, does no longer delves into the matter of the owner of the land which is used for agriculture. It best discusses functional land, which is utilized for agricultural. It divides tillers as: important farm workers, who till for as a minimum six months period at a stretch and negligible employees, who are agri-labourers or worker's generally. It does not postulate land possession or mention the marker of 'farmer' in any respect.

Recognition Of Land Rights For Women: The census is not the only authority and the issue for deciding the women and their rights over the land of their recognition as farmers. an economist by profession Ritu Dewan who also had the post of president at the Indian Association of women's studies has a very different viewpoint. She says that the only solution is to give access to women in equal capacity as men. "Land rights for women must be recognised in village land records, like the Saath Baara Utara (form 7/12) in Maharashtra. This form does not even have a column for gender." Records have been converted into digital format. if they are edited then it will automatically convert the women cultivators

into farmers which will be e as is accepted by the government. According to her, the solution provided by MS Swaminathan is not practical. she fees that even if the card is issued the problem of the women farmers will not be eliminated. "We don't need the Aadhaar or different kinds of cards. India has a national register to recognise these land rights," she said.

Female economist and writer Bina Agrawal has written a book in 1994 full stop the book was titled A Field of One's Own. In this particular book she has made a connotation of the issue of land ownership by women to female subjugation in India. she was that the women will become empowered and have the power to take decisions only when the land is owned by her in the household. This 1994 book had actually led to various movements where the women understood their rights and started walking towards it from a gender sensitive legislation point of view.

Government Laws And Reforms On Women Farmers' Rights: There have been various laws and policies by the government which have specifically worked towards the distribution of land to those people who are working on it. The movement started specifically after the Ninth five-year plan (1997-2002) where the redistribution of the land to place in actual certainty. The land was distributed in the name of major only men but around 40% of the women were able to get the land but the rest had to jointly share the ownership of the land with her husband.

By the time the Tenth five-year plan came the government became more active. the government came up with a scheme where it was giving some incentive to female workers who bought property in their own name. The incentive was given in the form of concessions. In the Legislature, the main change happened in Hindu Succession Act. In this act the girl child or the daughter had the right of equal ownership in the property of her father or ancestor. The Maharashtra government also launched a program in 2009, where it lends the land to women under self-help groups. Also law has supported women on various counts but social recognition and the implementation of law has always been in controversy. researches have shown that the legislature even the formed has not helped many women who are in need especially in India. even though the law has given the right to girl child to ask for property rights in a father's property but the social norms does not dictate this law full stop the land records need to be updated and accepting this law then only there might be changes in the concept of societal acceptance.

CONCLUSION AND RECOMMENDATIONS

The society has by and large not accepted from cultural and traditional basis the inheritance of land to women. The patriarchal society norms have always given preference to Man of the house to own the land and other properties. the girl when she marries she goes to her spouse's house and her positions pass on to her husband not to herself. she is not given that authority to decide on her land or her property even if she has inherited it from her parents in case of absence of a brother.

For the change to happen to the women farmers it is required that the woman is given the societal acceptance of owning the land and power to decide for her own land. problem of not being accepted as farmer but being given the tag of cultivator has led to a woman being devoid of various schemes by the government for example loan for cultivation loan waivers Crop Insurance subsidies or even compensation to the family if they commit suicide in the worst case scenario.

On July 22 this year, Chief Minister of Uttarakhand, Trivendra Singh Rawat, announced that they would amend the Zamindari Abolition and Land Reforms Act of 1950. He stated that they are going to amend the 70-year-old law to give land ownership rights to women along with their husbands. This can be a path breaker and a light to show other states the path towards women empowerment in near future.

The age old theory of owning a piece of land to be considered a farmer as is recognized by government, needs to be amended at the national level. Even if these farm working women are not considered farmers, the policy need to change to include them for accessing the benefit given to farmers.

The disparity in the treatment is a clear hindrance towards sustainable development and empowerment of women in India. The Bill of 2011 should be approved with the amendments regarding the rights given to the women farmers who are designated as cultivators today.

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Reference Groups and Opinion Leadership Effect on Purchase Decision of Consumer Durables

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ABSTRACT

In this research article, authors made a fundamental study on consumers to find the repercussion of the reference group and opinion leader on consumer behavior and the decision-making process. In addition this proposed research work attempts to understand the fuzziness insight into how consumers evaluation in purchasing FMCD products decisions and alternatives. This research study focused to explore the reviews of various literatures in depth on the effect of opinion leadership as well as Reference groups on Consumer Decision Making Process or durable goods. Consumers with whom one intermingles, such as friends and family, and those who one admires, like celebrities, can persuade one's choices and buying decisions to a huge extent. Considering the marketers, the analysis of interpersonal communication amongst the different clusters of consumers became essential. The researchers have assessed and comprehensively presented the outcome of the various pertinent research output. This research has revealed that family, friends and word-of-mouth by Opinion leaders play significant role during purchase decision - making process of Durable Goods on an offline basis. Further concludes that the market needs to develop a strong relationship with opinion leaders in their merchandising practices geared towards customers in less time to influence possible consumers to buy back and retain the trust of customers.

KEY WORDS: CONSUMER BEHAVIOR, REFERENCE GROUPS, OPINION LEADERSHIP, CONSUMER DECISION MAKING, FUZZINESS, AND MARKETERS.

INTRODUCTION

Human being in common likes to be a part and parcel of a variety of groups, in which the group consists minimum of two or more than two individuals those who have several common goal or several common aspirations values, and beliefs. The relationship among group members can be either explicitly defined like that of club association, family and so on, be implicit like that of a group of highly influential celebrity's stars who are referred to as a group by their fans. On the other side, reference group is a group of individual person who act as type of the point of reference, with respect to the formation of attitudes behavior. Marketer usually looks at reference group are the most influencers of purchase decisions of the individuals.

Reference Group (RG) as a term was used by Hyman where he found that respondents measure up to themselves and they are influenced by either person or groups (Hyman, 1942)[1]. The concept was further polished under behavioral sciences studies, where-by a person is anticipated to be part of the community, or seeks to fit in to or search for not to be a piece of community (Stafford, J. 1966)[2]. Studies on RG persuade differ from men to women where gender is regarded as to be an influential

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element in consumer buying behavior (Schiffman and Kanuk, 1996)3. The same persuade is also dissimilar for different product categories (Nair & Pillai, 2007; Holmberg & Ohnfeldt, 2010)4. RG persuade has also been found to be pertinent in understanding the very noticeable attention of the product (Xihao,H., & Yang, J, 2006)8. Studies pointed out that public luxury services were more vulnerable to RG influence as contrast to private necessity (Mehta et.al, 2001)5.

Venkatesan (1996)6 has confirmed that whenever Consumer makes a decision of buying very high priced products they take the help of society. In view of the fact that, the automobile is used to truly move in the region of and to be noticed, it is significant to be familiar with what things persuade youthful executives before customers to construct their buying choice in terms for a particular color, type, size, design of car. The RG's are the compilation of friends, celebrities' family members and opinion leaders. RGs are in general influence the state of mind and behavior of a person. These RGs acts as a focal point to build values and standards. This occurrence leads to think of preferring specific brands of products which makes a path to purchase related products. According to Abideen & Latif, S. Saleem and (2011)7 said that the spots personality and famous persons have greater impact on the behavior of consumers. His study has depicted that formal RGs are the important groups which influence young executives for the buying decision of the durables products.

Reference Group: RG's Consumer assesses their situations, attitudes, values qualities, and behaviors10. RGs work as a reference to Consumer to assess their undertakings, their role, recital and goal. A RG have the option of forming membership groups. According to Lin and Chen (2009)9 he focused on the persuade of buying plan on re-buy resolutions, and to examine the sensible effects of RGs and expected hazard. The paper identified that; buying intention will have positive influence on re-purchase decision.

RGs validate and find out the nature of purchaser/ consumer/ buyer or group's personality and sociological characteristics. It is fact that the cluster where the purchaser seeks to relate her/himself mentally. It is very important to recognize a purchaser's perception, mind-set. RG can be classified as direct and indirect RGs, on the basis of interaction with the referent. In the direct referent groups, there is personal interaction with the referent, say, a family member, friends, peer. In an indirect RG, there is no personal interaction with the referent, such as in the case of politicians, cricketers, or movie stars. Someone you admire for good dress sense but have not ever talked to is also an indirect referent. According to Al-Duhaish (2014)11 the study focused at revising the consequences of the RG on the purchase decision for the Youth Consumer at Saudi. The outcome of the study showed that the work colleges majorly influence on the clothes or garments purchasing choice, thereafter celebrities, friends, stars and family.

Fast Moving Consumer Durables (FMCD): The taste and preference of the consumer is extensively ranging and frequently. The accurate forecast for consumer durable decisions are complex (Sonnenberg and Erasmus, 2005)12 while the ultimate purchasing judgment of the consumer will vary between decision styles and profiles cannot be directly applied to distinctive purchase conditions wherein the level of involvement of the consumer differs. Involvement of the consumer in purchase making decisions may be product involvement or purchase involvement. Product involvement is the enduring interest of consumer in a commodities or brand and buying participation linked to the requirement of the product. An individual who felt the need to buy van, for example, is expected to have high purchase involvement and not the product involvement. The Personal factors and situational factors make it complex to forecast the Consumer decisions beforehand (Sonnenberg and Erasmus, 2005)12.

The author Cooper (1994,) 13 defines that the durability means strength of the product to play a vital role over a long period of time under normal circumstances without any expense on repair or maintenance. Durability of a product are measured based on the number of years it exist, hours of use and operational cycles etc., 14. Every product which is durable should be capable of fine-tuning to scientific and technical developments15. Having reverence to consumer behavior towards this category, consumers are likely to spend maximum effort for comparison, evaluation of criteria, and point of purchase sources, inspection, trial and purchase. The internet has emerged as a significant and the largest external source of information. Research study has revealed that the consumers who look for brand and product through online are the persons who purchase online more compared to persons who do not search through internet16. Further to the proposed work considered three important segmentations of Durable Goods in India and these consumer durables usually have low volume but high unit value, they are as fallows.

A. Large electronics goods or White goods: These are the large electrical items Goods utilized domestically which are finished with white enamel like air conditioners, Refrigerators, washing machines and so on.

B. Light Electronic Appliances/kitchen appliances / Brown Goods: Normally these are light weight electronic items such as Mixer, Grinder, radios, and Micro ovens and so on.

C. Consumer electronic goods: It refers to any electronic devices used by consumers for daily inside a house. It includes Tablets, Televisions, Computers, Laptops, MP3 Players, DVD Player and so on.

Opinion Leader: In RG Consumer look for advice from Consumer whom we believe experienced in a particular thing, product/brand. Many such populaces around us are treated or viewed as proficient person in one or the other area or thing. People looking for advice or suggestions from the person who are expertise in

their area are considered as Opinion Leaders (OL) and consumers are in search of suggestion from opinion leaders are identified as opinion seekers. With regard to home appliances OL play very important role in decision making. Katz and Lazarsfeld (1966)17 said, the opinion leaders especially in mass media exposure go ahead of non-opinion leaders. For an example, a family member who have enough experience regarding scooter and runs a garage can demonstrate to be enhanced source for the required information when a scooter require to be acquired than a near colleague or an associate who is very familiar regarding present trends. Hence an OL acts as a word-of-mouth correlation among opinion seeker and giver.

The opinion leadership takes place in the following situation

- When an entity looks for guidance from others persons.
- During an entity willingly gives facts to others.
- At what time the related fact to be produced during normal communication with a group.

Opinion Leadership Model: A model for perceptive is how various factors influencing a consumer buying process, and a model is proposed as shown in Figure 1. Opinion Leadership is the method wherein the OL unofficially persuades the attitudes of consumers; either consumer is the possible opinion receiver or only opinion inquirer. An opinion receiver recognizes the OL as a highly convincing, objective source of product details who can help to reduce the consumers search and analysis time and professed hazard. The OL process normally occurs among friends, neighbors and colleagues that frequent physical propinquity.

Figure 1: Opinion Leader (OL)
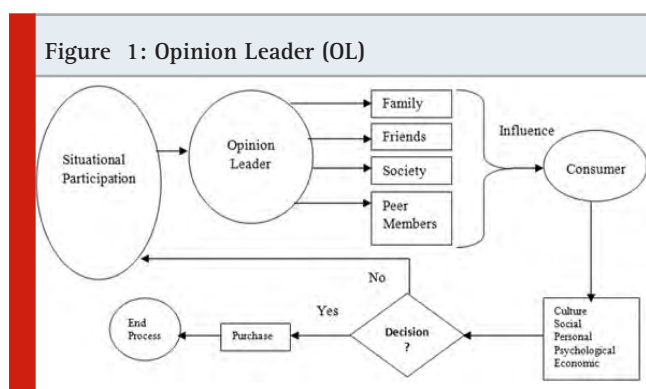
Therefore OL process has ample opportunity to seize comfortable product related conversations. The above such conversations generally transpire naturally in the perspective of the product-category usage. In turn these group influence consumer to purchase the product and consumer takes into consideration various factors for purchase decisions. If the consumer is confident enough to purchase the product without any fuzziness, consumer proceeds to purchase the product and end the process. Suppose if the consumer in a dilemma or fuzziness leads to reject the decision of purchase.

Consumer Decision Making: Consumers make a decision on a usual basis. A decision is merely making a choice. These choices can be concerning various brands, products, stores, etc. now and then; the consumer does not get to make options as there is only one option accessible, so one has to choose that only. The purchase decisions taken during such single product situation are known as 'Hobson's choice'. Several consumer researchers view consumers as cognitive or thinking decision makers who actively seek pre-purchase information, evaluate options, and then reach a certain decision. This view also holds that in this era of information overload, consumers will not try to obtain all the information for each and every decision and would rather stop looking for more information if consumer feel that they hold sufficient information to make a 'satisfactory decision'.

Emotions like achievement, fear, success, love, and so on, frequently persuade one's purchase decisions. Consumer moods also persuade decision making. Research of consumer frame of mind and their effects on decision making can be particularly significant for service encounters, point-of-purchase stimulus, context and content of marketing communication (Gardner & Meryl Paula, 1985)18. Store image can also impact the mood of the consumers and affect decision making. The store ambiance can lift the spirit of the consumers, or it can displease them. A store with good music, lively colors may lift the consumer's spirits and can influence time and money spent in the store, number of items purchased and revisit intentions of consumers (Smith, et al, 1993)19.

Review of Literature based on RG and Opinion Leaders: The numerous definitions about the consumer, the classification of the consumer buying processing and decision makings opined by the scholars revealed since 7 decays that the various role initiator, influencer, decider, buyer, user, maintainer, disposer are played by parents, children in the family which in turn impact on the behavior in the family in decisions making. With regard to the buying rules the scholars pointed out towards the compensator buying rules that consumer that they mostly apply even in the online purchase that is., in e-commerce. However research conducted take up the analysis of existing reviews of the proposed work limiting to the concept of RG and OL. Following are the few listed works since 1942 to till date have been considered in this research paper work. (Park and Lessig, 1977)20 stated that RG may be in various form, it may be imaginary or real having major influence upon a person's assessment. Hyman (1942)1 elaborated the term 'RG'.

According to (Stafford, J. 1966)10 the cohesive groups are attractive to the members of group persons and RG cohesiveness induces persons brand choice. Mourali (2005)21 pointed out that social and RG influence has significant role in decision-making procedure, which might be accepted by most consumer behavior models. In addition, a considerable number of studies regard as RG persuade as one of the important factors which influences the consumer purchase decision-making

process. The relationship between RGs and consumer's purchasing decision making has been brought out, and the importance of study those together has also been suggested (Yang et al., 2007)8.

Bourne (1957)23 state that various group induce in marketing re-search and concluded RG has a greater influential role on marketing studies. According to (Hawkins et al., 1998)22 stated that RG not only includes regular contact group for instance acquaintances, colleagues work associates family members, and so on, however the RG also covers groups that a person do not have contact with persons in a certain social rank. According to Singh and Kaur (2004)24 examined that diverse income group and their customs, ethics and children's role in family is the most important factors supports in the household in decision making. According to Kau and Jung (2004)25 established that uniqueness manifests in behaviors in the path of opinion leadership, information distribution, RG influence, family orientation of a person.

Dalrymple, Shaw and Brossard (2013)26 reveled that, the author group have conducted a range of studies wherein the researcher have identified that OLs have noteworthy role on the individual behaviors of varied other individuals. Authors Diaz and Maria (2013)27 has recognized that when pricing strategies like skimming pricing is offered for the product with high prices, and afterward with lesser ones, they stated that consumers are desired to buy the product at lesser prices. This means that vendor of the product can alter the intellectual condition of the buyers by encircling with prices to induce the consumers to make purchase decisions. Bruno and Hustad (2013)28 in their research collaboration has recognized that the important position played by opinion leaders as a linking pin between the public and media. Authors' stresses on the opinion leaders get information from the forum and convey that information to associates of the cluster based on their own interpretations.

Figure 2: Individual consumer
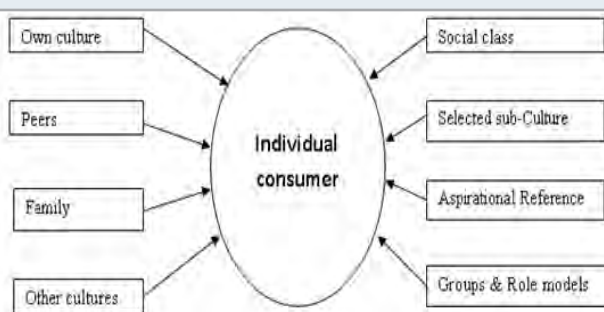
Reference Group and Opinion Leaders: The RG may be identified as having a positive or negative reference for an individual. Group's form which people try to distance themselves due to their negative influence are known as avoidance groups. An individual RG may be as small as a family or as big as a nation or culture as drawn association in Figure 2.

1 Types of influence by Reference Group: RG can be of various types. RG has influenced in consumers' decision making. Influences exercised by RGs are mentioned below in Figure 3:

Figure 3: Types of Reference Group
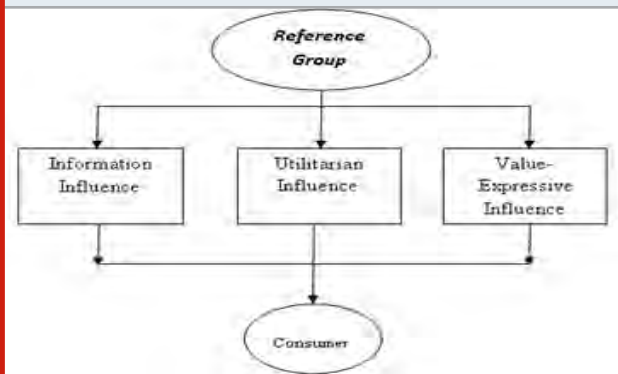
Information Influence: Consumer seeks out information regarding various brands from a union or groups of experts and from others who employee with the trade in as an occupation. Generally it is the inclination to admit facts from known personals as confirmation concerning genuineness (Deutsch and Gerard, 1955)29. While formulating the purchase decision, usually consumers have a propensity to look for supplementary measurements of unrelated different options or obtain wrapping up from the different brands RG associates acquire (Park and Lessig, 1977)20. Persons performing as reference may possibly give guidance as a clarification to a fuzziness (Burnkrant and Cousineau, 1975)30.

Utilitarian Influence: The person's decision to buy or purchase of a specific brand product is induced by the choice of associate workforce or with whom he or she has societal communications (Park and Lessig, 1977, 1977)20 .This RG influence is alike to the fact that people change their thoughts and values to be acknowledged by others (Deutsch and Gerard, 1955)29, traditional values outlines of its dangerous not to act in a manner" (Asch, S.E. (1952)31. A person's branded product purchasing conditions can be predicted to act in accordance with the preferences of another person or group.

Value–Expressive Influence: The individual thinks it is better to be similar nature of person that advertisement demonstrates utilizing specific trademark or brand. The person sense that the custody of a selective brand, which is used by certain people, whom he has a high regard for, will also give him the same type of picture (Park and Lessig, 1977)20. Deliberate fulfillment to group regulations may trigger from a person's aspiration to get enhanced picture by recognizing with the regulations of respected group (McGuire, 1969; Park and Lessig, 1977)32, 20.

Reference Groups and Brand Associations: Brands utilized by aspiration and member groups from time to time connected to mental state individual as brands are used to depict and generate ideas (Escalas and Bettman,

2003)33. belongings and brands in various situations accustomed to fulfill emotional needs as they produce individual ides, strengthening individual identity and differentiating self from other individual persons (Ball and Tasaki, 1992; Belk, 1988; Fournier, 1998)34, 35, 36. Possessions and brands merely serve as a social status and attach to one's society and cultural grouping. (Muniz and O'Quinn, 2001)37. Even though author has experimented the concept of group influence on the individual members it holds stand even today that every individual buyers and having much more influencing factors that makes buyer to make a decision.

Important Reference Groups and Appeals: Friends are major influencers of a lot of consumption choices of individuals and come next only to the family. Friends provide the first social circle an individual has outside family and provide a sense of companionship. Shopping groups are the people who accompany while they go out shopping and they help in selecting appropriate products and brands. Brand communities consist of people who are users of a particular brand. Many marketers have identified the importance of brand communities, which not only emotionally bond the consumers to the brand but also enhance consumer loyalty38. Many RGs that a consumer consults while making a purchase decisions includes works group consists of peers, subordinates, and superiors all are part of work group. Consumer- action Groups are effectual influence in consumer decision making as well as common behavior for example disaster control, public health, anti-drugs campaign, or any other cause that affects people in common.

DISCUSSION ON DECISION MAKING

It is quite natural and common practice that most human beings tend to takes a number of decisions to solve their day to day problems without preventing to believe about the procedure involved in arriving at such judgments. Decision making is a process of selecting appropriate options or many more alternatives. While shopping any customer enjoys the liberty of selecting a specific brand or product in a bunch of similar product categories. Understanding the Consumer buying rules have been playing vital role in purchasing any product and it is been a very important for the marketer to understand the rules which the consumers apply while purchasing the products. To be more precise opinion leaders enthusiastically gain and accept the information distributed by the mass media, process and pass on them, while the majority of the public depend primarily on the interpersonal communication with the opinion leaders to get information in order to guide their own proceedings.

Here, as a medium of information, opinion leaders have vital influences on the community. Visibly, the 2-step Flow (by sociologist Paul) of Communication stress the persuade of opinion leaders towards the thoughts of the wider population, and stresses the reality that the influence of interpersonal communication towards the public is more recurrent and more effectual than the influence of the mass communication towards the same spectators. Due to the widely available Internet and its applications, online resources the opinion leaders are come into sight. 'Opinion followers, with lesser tendencies and self-confidence, prefer the recommendation of others'. Buyer often takes the help of opinion leaders for any purchase decisions. 'Opinion leaders are in general people and are very conversant regarding specific product or service than the usual buyer. In fact, opinion leaders can depict how a product is observed. (Boundless, 2016).

OL are normally best for put into practice the word of mouth system, a marketing practice in which normal people converse with others their own opinion on a specific product or service. The exquisiteness of this method – it is basically free of cost. It necessitates more or less no investment on the part of an alliance. According to numerous reports, dominant people can influence the buying habits of the persons by word of mouth. In case of online purchaser, it bounded up to about 8 people on an average. The Excellencies of the product will be yet focused by opinion leaders and the decision-maker whenever he wants to take purchase decision he looks for their advice. People avoid taking risk in purchasing, if judgments are hard. In common, most of the consumers are definite to be in-contact with the opinion seeker to obtain the recommendation from the OL.

In marketing the word-of mouth communication creates consumer publicity which can play a part as an imperative responsibility in the success of a product39. Unfounded information can every now and then have negative impact on the brand. Sporadically tenuous conversation certainly affects the image that a company has built since many years. It is significant to make a note of those consumers who are not satisfied normally pass on negative comments to more populace than satisfied consumers and the negative information is weighted more deeply than positive information, by the undecided new product adopters40.

OL in common, are those who have proficiency or having higher knowledge about one particular product or activity, and has additional skill of persuading other Consumer. OL most of the time is of different category depending on their understanding and induce the buying decision of the recipient. In general, OL are the Consumer who has dominance in variety of subjects and are difficult to find out. Generally, OL are well versed about on product groups and these OL have high participation in associated field. Market Mavens are relating to a separate class of opinion leaders who have deep market-Participation. They enthusiastically hunt for the source of information about the market in which market Mavens feel it is helpful for acquaintances and other who help unconditionally (Fieck, Lawrence, 1987)41.

Surrogate buyers are the expert persons and they are hired by buyer to filter the available verity of alternative products and brands. Surrogate buyers make suggestions

to the buyer and in several situations consumer make dealings on account of their head or employer (Michael A Solomon, 1986; Aggarwal, Praveen & Cha, 1997)42,43. Purchase comrades are believed to be fairly dominant OL at the place where buyer makes purchase decisions at physical location. Purchase pals helps buyer to bring down the stress and wariness an individual faces at the time of making a purchase, especially these Purchase pals helps in expensive product. The strong fix purchase friend provides psychological support and gives helps the individual selects the products that fit into his/her taste (Kiecker, Pamela & Hartman, 1994)44. The opinion leadership process occurs because of various reasons of both revels that the OL, opinion receiver and the opinion seeker. Following are the four foremost reasons behind the functioning of OL.

A. Firstly self –participation, advising others, provides higher satisfaction to the OL in terms of the attentiveness they receive. The role of OL also includes a feel- better factor of facilitating others to think and to make a decision furthermore raising the familiarity of opinion seekers and receivers.
B. Secondly the product involved OL might sense the inevitability to speak to opinion receivers regarding the product whether it is excellent or terrible. The detailed facts conveyed would be confident if they are contented with the product or brand, and pessimistic, if OL are disappointed with it.
C. Thirdly societal association OL tend to disburse their item for consumption experience with Consumer in general as an expression of bonding. In this scenario, the OL does not feel the urge to talk about the product/ brand due to positive or negative experience, as in the case of product association.
D. Fourthly in message involvement with a rising numeral ads being focused at consumers, these ads frequently turn into the matter of debate. Consumers while making buying decisions to purchase durable products, consumers apply various decision rules, which include compensatory and non-compensatory decision rules.

CONCLUSION

In this research paper work we present the outcome of the significant study on several insights of the impact of the Reference Groups, Opinion Leaders on consumer behavior and the decision-making process on an offline origin. Further the study has provided approaching ways into how consumers evaluate, arrived at purchasing decisions and alternatives, particularly in purchasing FMCD products. According to the above revise, friends, relatives, and opinion leaders influence consumer behavior on a large scale. Opinion leaders play a significant role when making purchasing decisions. It is very significant to note that the market buzz is a strong tool in the hands of marketer. Word-of-mouth greatly affects consumer behavior, which, if positive, it is certainly leads to create huge profits for the seller and, if negative, negatively affect the consumer decision-making process. The marketer needs to develop a strong

relationship with reference group and the opinion leaders as a part of marketing practices to reach customers in a little while to influence consumers to buy back and retain the trust of customers. The current market trends for the durable products are more aggressive and are very competitive. Hence, the manufacturers of the durable products must consider the consumer interest to increase their production and sales.

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Impact on Employee Morale Post-Merger of Telecom Giants in India

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ABSTRACT

Merger of any two organizations has many different reasons. Many organizations merge to increase their market reach and reduce costs. In a merger, the consideration is mostly given to the finances and very rarely to people. In such a scenario it is essential to understand the impact on the people, particularly the employees affected by it.Through the following research paper we have tried to study the impact of merger on the morale of employees in telecom sector in Maharashtra. A questionnaire based on Gallup G-12 survey and literature was designed and circulated across employees of the merged organizations to understand their morale post-merger. The finding would help organizations design policies for development of the employees. Mergers have an impact on employees as much as it has on the finances and assets of the organization. The onus lies on the board of management to ensure a smooth transition post-merger that leads to a healthy working environment.

KEY WORDS: MERGER, MORALE, EMPLOYEES, TELECOM SECTOR.

INTRODUCTION

Today economy is growing every moment, whereas, organisations are face challenges to maintain existing market share for its existence. There are quest between companies to gain competitive advantage by providing value added services, innovation, excellent customer experience, transformation projects and automation. All this ways are excellent for growth but still organisation many a times have to take big strategic decisions like "Merger" to gain competiveness, growth, diversification, economics of scale, synergy or to create global presence.

Merger broadens the portfolio of an organisation and reduce business threat; Merger helps in entering a new markets or geographies to capitalize on economic scale. Merger sometime become a tactical requirement for an organisation looking for market expansion in particular sector or geography, this can also be an outcome of high completion and disruption pressure. Merger is when two organisation come together to form one single entity to increase profit margins and shareholder value. Merger is trending in various industry mostly seen in Telecommunication and Service sector.

Merger play a critical role in the success of many modern organizations. By increasing market capitalization, merged organisations can compete with other larger and well-established companies, whereas other benefits and goals of Merger include market penetration, vertical expansion to control supply and distribution sources, market entry, identifying asset potential and economics of scale (Eccles, Kersten & Wilson, 2001). India is showing increasing trend of merger in last two decade, but post liberalization for many years' mergers was not a common

trend. In early years, there exist various limitation such as lack of rules and laws supporting merger. However, in last two decades we can see many mergers happening within India. In the latest EY latest report, Indian Merger & Acquisition for the year 2017 was with 1022 deals as compare to 895 deals in 2016, which was highest since 2010, whereas the deal value was lower by 12% in each previous years. Amongst all Telecommunication sector led with the highest yearly deal value of (USD 14.7 billion) recorded in last 10 years.

Figure 1: Merger & Acquisition in last 5 years with deal value and numbers.
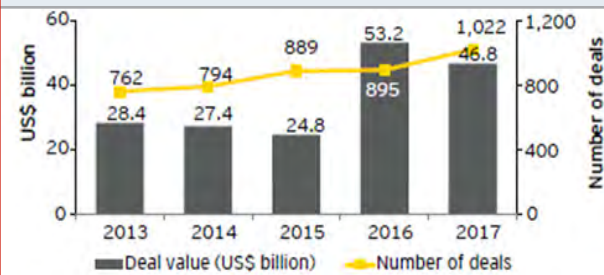
Source: EY analysis of Thomson ONE data

Figure 2: Merger & Acquisition in last 5 years across market sectors.
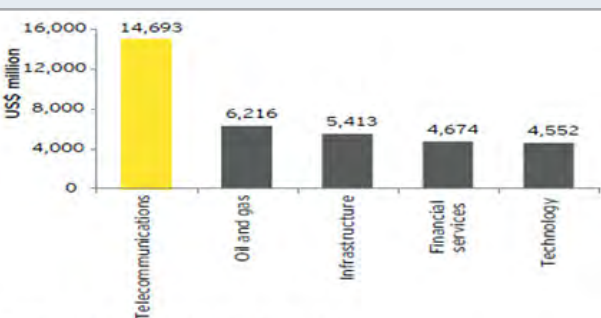
Source: EY analysis of Thomson ONE data

Telecommunication sector in India is facing tremendous changes and stiff competition for many years. With huge customer base available in India, tariff rates are hitting their bottom line and in addition, telecom companies are broadening their spectrum acquisition and infrastructure. The situation got aggravated in year 2016 with the entry of Reliance Jio, which act as a disruption to the complete telecom business model. Jio offered free voice and data services to its subscriber. This forced the other companies to drastically cut their tariffs rates, which create pressure on their market share and profitability. All these factors triggered a long-awaited union in the telecom sector, causing announcement of mergers within this sector.

Some of the important Merger happened in last few year are:
1. Bharti Airtel Limited with Norway-based Telenor's India unit Telenor India
2. Vodafone Group PLC's India unit and Idea Cellular Limited. The merged entity will be India is largest Telecom operator by revenue and subscribers.
3. Bharti Airtel Limited bought Tikona Digital Networks Private Limited's.
4. Tata Teleservices Limited and Tata Teleservices Maharashtra merge their consumer mobile business with Bharti Airtel Limited.
5. Reliance Jio Infocomm Limited bought the wireless spectrum, tower assets, optical fiber network and media convergence node assets of Reliance Communications Limited.

With the current transformation in Indian telecoms market, there is a movement from uneven industry distribution to more balanced market with 3 to 4 main market players. Hence, industry will be more stable with tariff rates and can focused on stabilizing their merged entities to bring collaboration. With new National Telecom Policy launched, it will affect the regulation of rates and other factors effecting company profits. As a next phase, it is expected to see more such tie-ups in future to gain new technologies and business models, such as building IoT capabilities and mobile virtual network operator (MVNO) market, which will build new revenue streams and help in fighting competition (Ernst & Young LLP, Transaction Annual: Highlight of 2017 and Outlook of 2018).

Well merger is a healthy move for organisation strategically; this brings tremendous profit in terms of financial gains and market share. However, Mergers represent an ultimate change for an organisation. Merger is the biggest change that can happen in the life cycle of an organisation, hence it become more difficult, challenging or chaotic than anticipated. Employees on the other hand, often find it difficult to cope up with the ambiguity surrounding with merger. When two organisation culture and environment comes together to form one entity, It collide by bringing differences in the ways of working of operating model, It reduces the levels of commitments and trust for the new merged organisation. Employee feel insecure as merger bring duplication of services and staff, which may let to redundancy of roles and job cuts. This anxiety and confusion affects the morale of the employee, leading to employee related issues like lack of job satisfaction, increased employee stress, absenteeism, low motivation, decrease in creativity and innovation, lack of inter-organizational employee collaborations and attrition of high performing employees; which at the end effects organizational objectives and effectiveness.

Literature Review
1. (Cindy Kangetta, Margaret Kirai, 2017) explains the business significance of mergers and acquisitions and its effect on employee morale in the Kenyan insurance sector, the author explain the importance of employee morale and it is essential for organisational effectiveness. The study indicates that high morale can enhance positive job performance, job satisfaction that helps to have a long-term association with employee with organization irrespective of the business changes like merger. Instead, low morale in employees because of merger led to increase in costs,

absenteeism, poor job performance, low motivation and interest, lack of creativity and innovation, lack of inter-organizational collaborations, all this in turn effect organisation performance. The finding helps define that merger companies acquire virtuous work environment to enhance job satisfaction, which in turn translates to increased employee morale.

2. (Jeff Badrtalei, Donald L. Bates, 2007) studied the effect of organizational cultures on Mergers and acquisitions: The Case study on DaimlerChrysler. The objective of this study is to look at employee behaviour because of merger and the lesson learned from its success and failure. It emphasise on organizational culture as one of the key in such cross-national mergers. The finding of this study enhance the literature of merger and acquisitions and conclude that organisational culture plays an important role in the integration process of merger. It suggested that a detail study of culture must happen in advance, where two different culture must be blended rather than changing it completely. It also talks about viewing employees as assets not liabilities. As merger bring reduction of employment cost, many a times such work force projections are not done adequately during merger, led to lay-off or job cuts, which in turn effects employee morale. With such low morale, merged organisation suffer heavy absenteeism, and labour turnover, which has a direct impact on organisation performance.

3. (Keisha Chambers, Andrew Honeycutt, 2009) study aimed to look at Mega-Mergers in Telecommunication sector, for examining Impact of merger on employee morale and turnover intention. The evidence shows that mergers and acquisitions majority of the time has failed to show better performance and achieve expected strategic growth as set in the premerger planning phase. The primary reason for performance failures was based on various human resources factors such as lack of management support, cultural differences, poor motivation, attrition, low morale and low job satisfaction (S. Cartwright and C. L. Cooper's 2000). The results suggest that, merger undermines employees feeling about the company and its confidence for future belongingness, hence leading to morale is low, which prompts employees to look out for better opportunity and leave the organization. Therefore, employee's perceptions on merger is important to study right from the beginning of merger to handle employee turnove

4. (Bruner 2005) explain that merger brings value to the organisation to fight competition and provide return on investment. Its bring together employees of both the organisation to create a new work environment and a mutual objective to achieve. However, human reactions towards any such big change are often difficult and disturbing. It involves factors psychological and sociological behaviour of employee. The new organisation need to scrutinize this change very closely understanding the behavioural and sentiments of employees of both the organisation, which will then provide an idea of what the new working environment, would look like.

If the changed in behaviour due to merger is not been handled properly it may hinder the progress of the project. It difficult to manage employee behaviour individually and it get more complicated when huge group of employees are involved. Organisation should be more sensitive towards employee's values, cross-country cultural diversity, practices, past experiences and culture.

5. (Kusstatscher and Cooper, 2005) talks about the essential component for a successful merger which is effective communication and constructive interaction between the merging organisations, this allows to create an atmosphere to collaborate and build capability. The author reported that if both partners harmonize, understand and respect each other's organizational values, culture, structure and operating model, that aids to transfer, and integration of capabilities for a successful merger. In addition, the willingness to collaborate and with the availability of financial and nonfinancial resources are vital for supporting integration process of two organisation (Haspeslagh & Jemison, 1991). Hence, it provides light on, how top managerial behaviour is very crucial for merger to drive transformation.

6. (Meschi, 1997) talks about the important factors of a successful merger between two companies depends greatly on how well the integration is managed. It brings the light to the previous literature that the most successful and best mergers happens when managers of both companies are align with each other on the understanding of ways of working and how to manage the people factor of this change (Fisher 1994). The leader's plays an important role in managing the change and must be willing to create a new culture that makes use of the best parts from both partners. In order to make change go smooth with both the companies, it is essential to be honest with employees with effective communication from the beginning phase of merger, which include sharing all aspects of agreements, providing assurance of job security and building trust for the new organisation. it is crucial that the two organizations build a strategy for cultural integration and value creation.

Research Objective

To understand the impact of merger on morale of employees in Telecommunication sector within Maharashtra.

1. To analyse the impact factors affecting the morale of employees post-merger
2. To compare the factors affecting the morale of male and female employees

Research Hypothesis

1. a. H0 = There is no significant relationship of organizational system support to the morale of employees post-merger

b. H0 = There is no significant relationship to peer and management behaviour towards moral of employees post-merger

c. H0 = There is no significant relationship to the

importance given to an individual for growth and learning and the morale of employees post-merger
2. H0 = There is no significant difference between the factors affecting morale of male managers to that affecting the female managers post-merger.

Research Methodology, Tools And Techniques: The morale of employees has been compared to the factors related to behaviour exhibited post-merger. The demographics consist of age, gender, total years of experience and years of experience in the company.

Research Design: The approach to the research included the exploratory research wherein the attributes of the population were determined by the convenience sample data obtained through online survey method. The questionnaire was constructed using data from Gallup G12 questionnaire and literature based on merger of companies. The data has been accumulated and treated according to the requirement of the analysis.

Sample Design: Convenience sampling has been used with data collected across primarily merged organizations in a couple of locations across Maharashtra

Data: Primary data consisting a sample size of 129 has been used for analysis.The data is collected from a couple of organizations across a couple of locations in Maharashtra. The data has been obtained through an online survey that consisted of approximately 23 questions including five demographic questions. A five point Likert scale has been used to understand the parameters, which resulted in the factors for the study. Three distinct factors that can serve as independent variables have emerged by conducting factor analysis. SPPS software has been primarily used to conduct the analysis. Factor analysis has been used to classify the attributes under distinct parameters through factorization. Linear Regression has been used to test the hypothesis.SPSS version 22 has been used to find out the reliability of the questionnaire, which is at a Cronbach Alpha value of 0.948.

Data Interpretation and Analysis
Source of data: SPSS

On testing the reliability of the questionnaire it can be seen that the data is very much reliable (Cronbach's Alpha = 0.948) as it is close to 1 the data is highly reliable. Hence, we can proceed ahead and analys the data

Table 1.1

Reliability	Statistics
Cronbach's Alpha	N of Items
.948	18

Table 1.2. The above table shows that almost 71% of the variation is explained by the three factors

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.539	53.368	53.368	8.539	53.368	53.368	4.742	29.638	29.638
2	1.457	9.104	62.472	1.457	9.104	62.472	4.288	26.802	56.440
3	1.349	8.431	70.903	1.349	8.431	70.903	2.314	14.463	70.903
4	.895	5.594	76.497						
5	.645	4.032	80.528						
6	.621	3.882	84.411						
7	.568	3.551	87.962						
8	.420	2.627	90.589						
9	.387	2.420	93.009						
10	.250	1.565	94.574						
11	.216	1.351	95.925						
12	.193	1.207	97.132						
13	.170	1.064	98.196						
14	.141	.879	99.075						
15	.091	.566	99.641						
16	.057	.359	100.000						

Total Variance Explained

Extraction Method: Principal Component Analysis.

Table 1.3			
Rotated Component Matrixa	**Component**		
	1	2	3
I know what is expected of me at work		.784	
I am not given work outside my defined role]			.541
At work,I have the opportunity to do what I do best every day]		.726	
I have the materials and equipment to do my work right]		.885	
I get good support from my co-workers for any help required in my work]		.717	
Co-workers from other organization have been very supportive post-merger]			.534
The work culture has not changed much post-merger]	.792		
In the last seven days,I have received recognition or praise for doing good work]	.749		
My supervisor, or someone at work, seem to care about me as a person]	.725		
My supervisor has not changed post-merger]	.722		
There is someone at work who encourages my development]	.763		
At work, my opinions seem to count]	.779		
The mission/purpose of my company makes me feel my job is important]	.675		
My associates (fellow employees) are committed to doing quality work]			.641
I have a best friend at work]			.639
Post-merger I feel my job security is under threat]			.818
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.[a] a. Rotation converged in 6 iterations.			

- From the rotated component Analysis we can see that three distinct attributes that emerge after conducting dimension reduction on the above 16 parameters
- The factors being:
1. Post-merger system support (7 parameters)
2. Relation with peers post-merger (4 parameters)
3. Individual importance and recognition post-merger (5 parameters)

- Regression was used to find out the relation between the morale and the factors affecting morale for employees post-merger.
- Morale was taken to be a combination of two factors namely
1. Employees being appreciated for work in the past 6 months post-merger
2. Employees getting opportunity to learn and grow post-merger

a. Predictors: (Constant), importance and recognition, peer relation, system support
b. Predictors: (Constant), importance and recognition, peer relation
Table 2.2

a. Dependent Variable: morale
b. Predictors: (Constant), importance and recognition, peer relation, system support
c. Predictors: (Constant), importance and recognition, peer relation

a. Dependent Variable: morale
b. Predictors in the Model: (Constant), importance and recognition, peer relation
From table 2.1 it can be seen that adjusted R square value is 0.745 and the p value is less than 0.05. Hence the regression model is healthy and justifies about 75 % variation caused by dependent factors on the independent factor
a. Predictors: (Constant), importance and recognition, peer relation, system support

Table 2.1				
Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.865a	.749	.743	.55507
2	.865b	.749	.745	.55296

Table 2.2						
ANOVAa						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	114.736	3	38.245	124.133	.000b
	Residual	38.512	125	.308		
	Total	153.248	128			
2	Regression	114.722	2	57.361	187.601	.000c
	Residual	38.526	126	.306		
	Total	153.248	128			

b. Predictors: (Constant), importance and recognition, system support

a. Predictors: (Constant), importance and recognition, peer relation, system support
b. Predictors: (Constant), importance and recognition, peer relation system support.

a. Predictors: (Constant), importance and recognition, peer relation, system support
b. Predictors: (Constant), importance and recognition, peer relation

a. Dependent Variable: morale
b. Selecting only cases for which Gender = Female
c. Predictors: (Constant), importance and recognition, peer relation, system support
d. Predictors: (Constant), importance and recognition, peer relation.

Dependent Variable: morale
b. Selecting only cases for which Gender = Female
c. Predictors in the Model: (Constant), importance and recognition, peer relation
From table 3.1 the R square value is 0.866 which is significant shows that 87% of variation is explained by the model. Since the p value is less than 0.05 the model is significant

Inference
We identified 16 parameters and when tested for dimension reduction we could bifurcate them into three distinct factors, i.e.

Table 2.3

| | | Coefficientsa | | | | |
| | | Unstandardized Coefficients | | Standardized Coefficients | | |
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.719	.304		-2.366	.020
	System support	.020	.093	.014	.211	.834
	Peer relation	.209	.098	.125	2.146	.034
	Importance and recognition	.964	.085	.774	11.401	.000
2	(Constant)	-.694	.278		-2.492	.014
	Peer relation	.215	.094	.128	2.281	.024
	Importance and recognition	.974	.070	.782	13.950	.000

Table 4.1

| | Model Summary | | | | |
Model	R Gender = Female (Selected)	R Square	Adjusted R Square	Std. Error of the Estimate
1	.934a	.872	.866	.34576
2	.933b	.870	.866	.34587

Table 4.2

| | | ANOVAa,b | | | | |
	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	51.371	3	17.124	143.237	.000c
	Residual	7.532	63	.120		
	Total	58.903	66			
2	Regression	51.247	2	25.623	214.194	.000d
	Residual	7.656	64	.120		
	Total	58.903	66			

Hypothesis 1
a. H0 = There is no significant relationship of organizational system support to the morale of employees post-merger
From table 2.3 it can be seen that there is no significant relation established between organization support system and morale of employees post-merger
Hence we fail to reject H0
b. H0 = There is no significant relationship of peer and management behaviour to moral of employees post-merger
From table 2.3 it can be seen that there is significant relation established between the relationship with peers and management and morale of employees post-merger

Hence we reject H0
c. H0 = There is no significant relationship to the importance given to an individual for growth and learning and the morale of employees post-merger From table 2.3 it can be seen that there is significant relation established between the relationship the importance given to an individual for growth and learning and morale of employees post-merger

Table 4.3

	Model	Coefficients[a,b] Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-1.129	.440		-2.565	.013
	System support	-.089	.088	-.053	-1.021	.311
	Peer relation	.273	.088	.144	3.108	.003
	Importance and recognition	1.150	.067	.916	17.260	.000
2	(Constant)	-1.406	.347		-4.053	.000
	Peer relation	.282	.087	.149	3.230	.002
	Importance and recognition	1.117	.058	.889	19.269	.000

Hence we reject H0

Hypothesis 2: H0 = There is no significant difference between the factors affecting morale of male managers to that affecting the female managers post-merger. From Tables 3 and 4 it can be seen that the significant factors impacting the morale of male employees are system support and importance given to growth and learning, whereas the significant factors impacting the morale of female employees are relationship with peers and management and importance given to growth and learning, which is different from that of male employees. Hence we reject H0.

Limitations

• The study has been conducted in the Maharashtra region and hence has a geographical limitation.

• The study has been conducted on the perception of the managers and other employees of the organization. Hence, there is a possibility for further study in the same after a certain time gap.

• The factors affecting the morale has been derived from limited literature and opinion of managers. There is a scope to enhance the study of the factors.

CONCLUSION

Morale is a critical aspect that builds the organization culture. On merger, there is a lot of uncertainty regarding the future of the organization. In such a scenario, it is imperative to nurture the employees and keep them in high morale. Through the study, we can identify the important factors that affect morale. Incidentally organization support system, relation with peers and management and importance given to individual growth and learning. The factors although critical are not same for males and females. Hence, we can say that the organizations can look into adoption op policies in these aspects post-merger. Overall, for a smooth transition the organization should support the employee in all terms without creating much turbulence in the mind of the employees.

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Mobile Supply Chain Management System Diffusion in Retail Firms

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ABSTRACT

Mobile supply chain management (SCM) is gaining recognition as a major source of cost reduction and supply chain performance improvement. The current literature related to mobile SCM needs to be extended further in order to provide insights into how retail firms can implement mobile SCM successfully. This study attracts its survey responses from a set of retail corporations so as to analyze the factors that have an effect on the diffusion of mobile SCM. The results of this study can facilitate call retailers higher perceive the implementation method of mobile SCM and formulate methods for productive diffusion of mobile SCM.

KEY WORDS: MOBILE SUPPLY CHAIN MANAGEMENT, RFID, GPS, EDI, WI-FI.

INTRODUCTION

Business today operates in a competitive and complex global environment. In order to compete with their rivals, manufacturing firms are implementing strategic supply chain management (SCM) practices to operate more efficiently and to reduce operating costs. Management strategies such as resource bootstrapping or bricolage has also found to improve the supply chain and firm performance [9] .Internet technologies are one of the key technologies that help facilitate the implementation of SCM [3].Internet technologies such as electronic data interchange (EDI) and business-to-business (B2B) enable seamless integration and information sharing between supply chain members. Increasingly, governments in many countries are treating the application of information technologies (IT) in SCM as an important part of their national plans. In Taiwan, the government has worked closely with the electronics industry to develop implementation plans and financial incentives to support the adoption of Rosetta Net – an e-business standard used in supply chains [10]. Singapore's government provides educational programs and promotions on EDI to encourage EDI adoption [1].Technologies such as EDI and B2B allow better sharing of information, and this leads to uncertainty reduction and improvement in supply chain performances [11].

Mobile technologies such as radio frequency identification (RFID), Wi-Fi and global position system (GPS) allow for the seamless flow of information between supply chain members anytime, anywhere. The applications of mobile technologies in the supply chain have created a term known as mobile SCM. Mobile SCM could be a comparatively new and rising space in provide chains, and it refers to the utilization of mobile applications and devices to assist the conduct of provide chain activities.

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With mobile SCM, a supply chain with an "internet of things" can be built up. "Internet of things" is a network that allows firms to track their products through the supply chain globally and run multiple applications simultaneously. Mobile SCM offers more than just the application of RFID. When manufacturers implement mobile SCM, they are using mobile technologies such as RFID, GPS, wireless sensors, personal digital assistants (PDA), and geographic information systems (GIS). Mobile SCM has great potential to transform the manufacturing industry and has attracted the attention of large automotive manufacturers such as Volvo Trucks [7][4], Volkswagen [4], and Ford [7][4]. Huang stated that mobile/wireless technologies are fast emerging as the next generation of advanced manufacturing technology [8].

Literature Review

Overview of Mobile SCM: Mobile SCM involves the integration of software application with mobile technology for example: Mobile Phone and Other online devices to provide a ubiquitous wireless environment. Mobile SCM in the retail sector include stock updating, customer service and tracking the product. Information in the Mobile SCM is board casted live without waiting time this real time information reduces response lag time and delay in processing transaction and ensure accurate forecasting of product demand and improve customer service.

A mobile SCM environment could involve connecting the mobile device to a company's server via wireless infrastructure such as GPS or Wi-Fi. This will allow information to be shared in the supply chain without the physical constraints of wire connections. Products in the supply chain can also be automatically identified, traced, and tracked throughout the supply chain using RFID. As RFID tags contain microchips with an antenna, the RFID reader will be able to collect product information (for example, product expiration, service history, storage history, and product location) from the tag through radio waves [6]. All these enable the integration of business processes between the supply chain members. With mobile SCM, supply chain members are able to track products without scanning the products, for example using barcode technology. The precise data information on product location, characteristics, and inventory levels offered by mobile SCM, also helps eliminate manual inventory counting, mispicking goods in the warehouse, and mistakes in order numbering [12].

Mobile SCM diffusion: Most of the stage-based diffusion models can be summarized in three stages: evaluation, adoption, and routinisation. The evaluation stage is when a firm evaluates the International Journal of Production Research 1199 potential benefits of mobile SCM. During this stage, it signals a firm's intention to use a technology before actual adoption. The adoption stage is when a firm has made the decision to use mobile SCM. Resources will be allocated at this stage to acquire mobile SCM. As Zhu stated, adoption does not necessary result in widespread usage of mobile SCM by a firm [13]. The routinisation

stage involves the installation and integration of mobile SCM throughout the firm and possibly with other supply chain members as well, which signals that mobile SCM has passed the adoption stage, and has a widespread, regular use in the firm. This research adopts the three stages evaluation, adoption and routinisation from the past literature.

METHODOLGY

SData: The survey was taken over on the different retail firms. A weeks upon distributing the survey, phone calls and emails were made to the firms to follow up with their progress in completing the survey. The survey was distributed to more than 20 retail firms of the 20 firms we were able to collect data at a rate of 100%

Measure: The measurements items were developed based on a review of the existing literature, as well as feedback from managers of several manufacturing firms. Consistent with the approach from Zhu [13], most of the survey items were adapted from previous research by [6], Wang [12] and Chong [2]. A total of 12 questions were used to measure the support for the mobile SCM in retail sector. Mobile SCM diffusion was measured by using evaluation, adoption, and routinisation. Responses to the items were made on a five-point Likert scale format ranging from 1, strongly disagree, to 5, strongly agree.

Figure 1: Company using mobile scm (a) Intends to use, (b) Business activities, (c) Functional areas, (d) easy to integrate, (e) comfortable in sharing information, (f) believes in privacy, (g) capital is high compare to industry, (h) knowledge, (i) financial resources for purchase, (j) previous knowledge to use, (k) trust and (l) satisfication.

disagree **neutral** **agree** **strongly agree**

5%
20%
10%
65%

(c)

neutral **agree** **strongly agree**

19%
33%
48%

(g)

disagree **neutral** **agree** **strongly agree**

5%
14%
24%
57%

(d)

neutral **agree** **strongly agree**

14%
33%
53%

(h)

strongly disagree **neutral** **agree** **strongly agree**

5%
20%
15%
60%

(e)

disagree **neutral** **agree** **strongly agree**

5%
24%
9%
62%

(i)

neutral **agree** **strongly agree**

14%
48%
38%

(f)

neutral **agree** **strongly agree**

24%
33%
43%

(j)

(k)
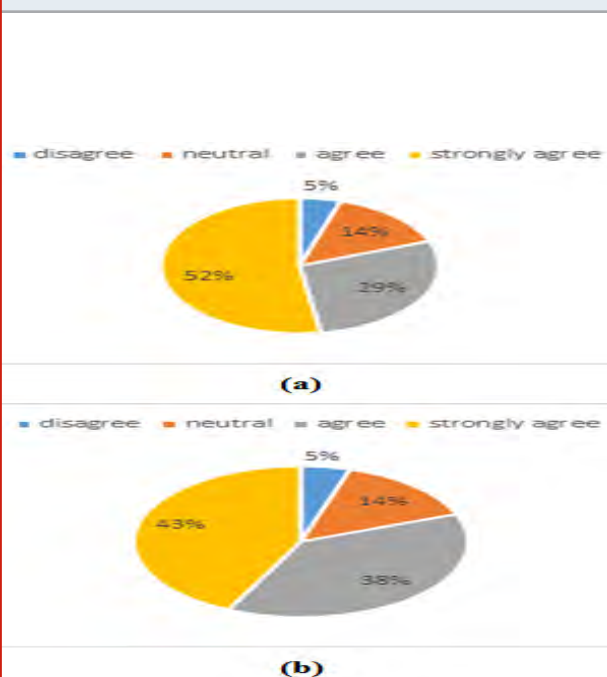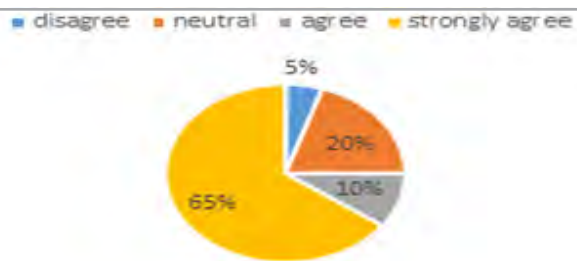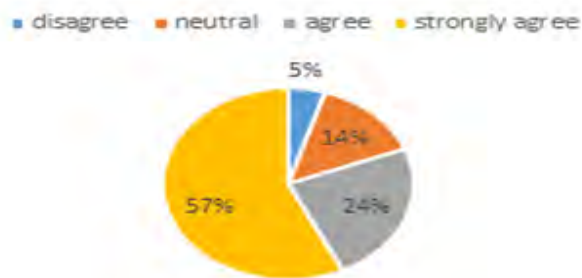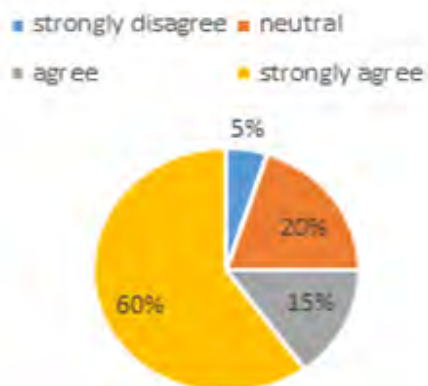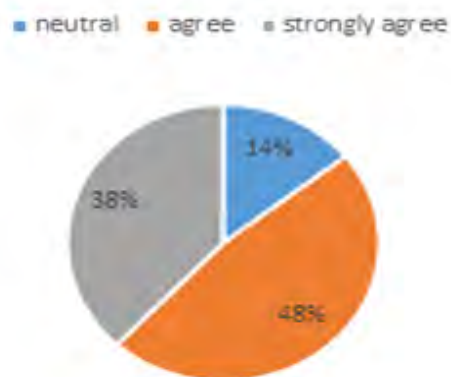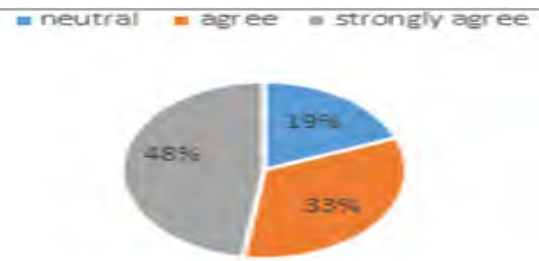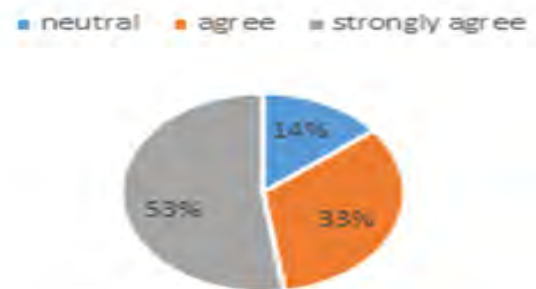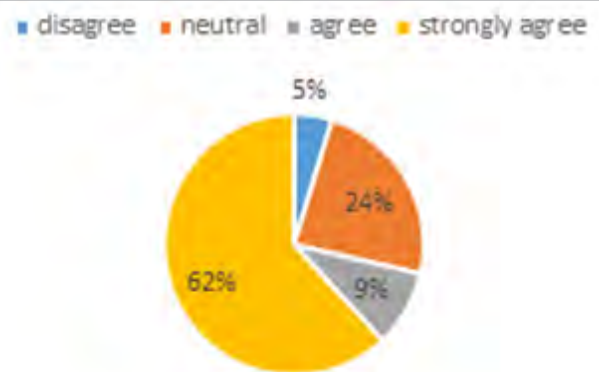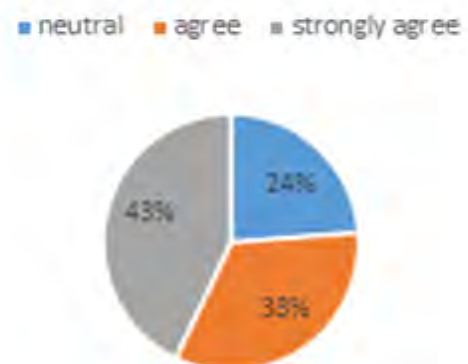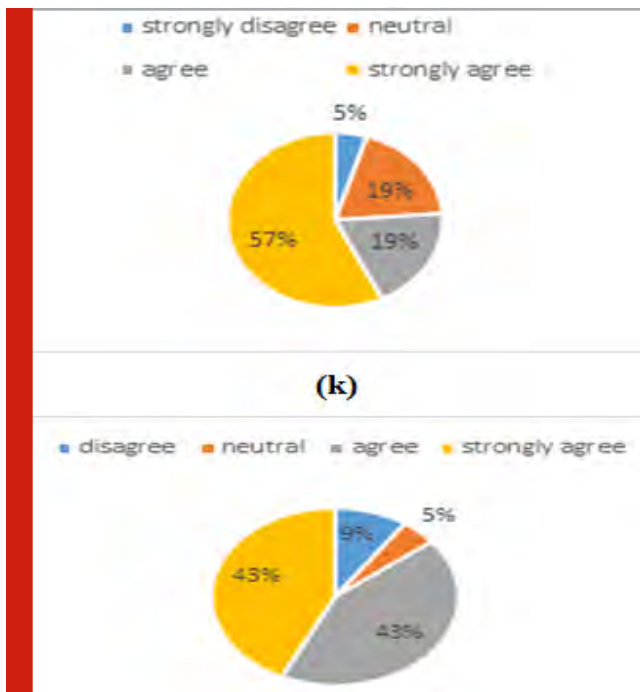
RESULTS AND DISCUSSION

This study empirically examined the application of mobile scm on the field of the retail sectors and the interest of each firm to adapt the scm in their sector which can make the smooth movement of firms. This was clearly understood by the question and the response which was given by each firms for the set of 12 questioner as shown in the below graphs.

CONCLUSION

The effect of a SCM strategy has become increasingly evident in the past decade, but a robust model linking SCM strategies to competitive priorities is yet to be developed. Given the number of SCM techniques introduced in recent years, managers need a decision framework to help them implement SCM strategies that are consistent with the competitive priorities of the firm so that scarce resources can be allocated efficiently. Mobile SCM is an emerging trend in the field of SCM [8]. This is an empirical studies on the factors affecting the diffusion of mobile SCM in the retail industry. Furthermore, this study examines mobile SCM diffusion by evaluating a staged-based model. This study has main implications. First, examines the research model in mobile SCM diffusion.

Second, this study also studies diffusion based on a stage based diffusion model. Third, this research helps decision makers in firms to formulate strategies in implementing mobile SCM. The result shows the key role during the mobile SCM. As such, one of the key deciding factors in ensuring that mobile SCM can be fully diffused in the supply chain is to establish relationships by building trust, collaboration, and information sharing.

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Design of Triband Textile Microstrip Antenna with High Directivity use Foam Substrate

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ABSTRACT

This article introduces the new design of a textile microstrip antenna with foam substrate. We designed a triband textile antenna with a large directivity. The antenna measured the wide bandwidth of 34% in the range of frequency is (3.561GHz-4.796GHz) ,8.8% (7.141GHz-7.813GHz) and bandwidth 7.7% (10.12GHz-10.91GHz) .Foam substrate is used in textile antenna .A shorting strip of H shape structure designed with foam substrate material having dielectric constant is 1.7 and conducting copper metal foil is used as radiation material. This textile materials are very flexible and it is washable. Here the measured and simulated results of the proposed antenna are satisfactory and provides to validate the importance of the designed textile antenna. So this antenna can be work in different frequencies bands such as WLAN, UWB.The simulated and measured results of directivity are in good agreement. Various radiation patterns analyzed.

KEY WORDS: STACKED BASED ANTENNA, FOAM SUBSTRATE, EFFICIENCY, DIRECTIVITY, TRIBAND APPLICATION.

INTRODUCTION

In recent years the textile wearable antenna is another approach in wireless power transmission system. In compact textile antenna has used very low dielectric constant which reduces the wave losses in surface .Also increases the impedance bandwidth. Due to the low profile structure the textile microstrip antenna is the best choice for wireless power transmission. Common textile material like flannel is used as substrate [1-2]. Wearable textile antenna has capability to provide the information of the garments or cloths by means of communication purpose. The wireless textile antenna has major scope in biomedical applications. Main two things to design textile wearable antenna are perfect flexible substrate material and planar structure[3].The most basic antenna parameters such as return loss,gain,bandwidth and radiation pattern can be easily measured by this textile antenna .The measured results have been compared simulated observations which exhibits the good concurrence. Another use of the textile antenna to study of environment behavior in emergency extinguishing system. Wearable textile antenna can easily monitor bio signals and communicate with local environment. In this article, we design, development the textile wearable antenna with high directivity and study its performance.

Antenna Design And Development: To design the proposed antenna we used the low dielectric substrate material as jeans having the value of dielectric constant is 1.7 and conducting copper metal foil is used in ground and patch of the textile antenna. This antenna operates in three different band of frequencies in wireless communications systems. Here conducting copper foil sheet is paste in the textile substrate with adhesive tape. Textile material may be used as cotton, jeans or flannel materials [4-6]. Proposed textile antenna geometry shown in Figure 1.The fabricated proposed textile antenna with foam substrate shown in Figure 2.

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Figure 1: Proposed antenna geometry (a) middle & (b) bottom view

(a)   (b)
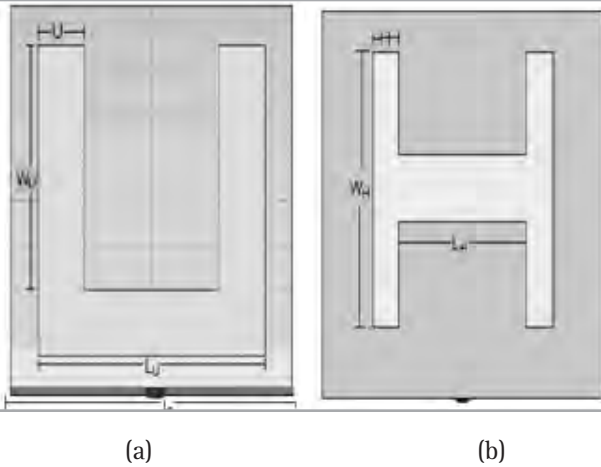
Figure 2: Fabricated antenna geometry (a) middle & (b) bottom view with foam substrate

The different antenna parameters calculated by equation (1) of textile antenna with foam substrate material are given below Table 1.

$$a = \frac{87}{f_r} \cdot \frac{94}{\sqrt{\varepsilon_r}}$$

Table 1. Antenna parameters and dimensions

Parameters	Value taken
Substrate thickness	2.9 mm
Dielectric constant	1.7
Length of lower patch Lu	93.5 mm
Length of slotted patch LH	40.56 mm
U upper edge	13.98 mm
H	8.8 mm
Loss Tangent	0.025
WH	63 mm
WU	54.8 mm

Where fr resonance frequency and ε_r is dielectric constant.

Table 2. Simulated results of textile antenna

Resonance Frequency (GHz)	S_{11} (dB)	Band width (GHz)	Directivity (dBi)	Band Width (%)
3.624	-20.65	1.235	7.123	34
7.588	-15.11	0.672	5.447	8.8
10.254	-13.97	0.793	5.170	7.7

Figure 3: S_{11} parameters and frequency characteristics of proposed Textile antenna with foam substrate.
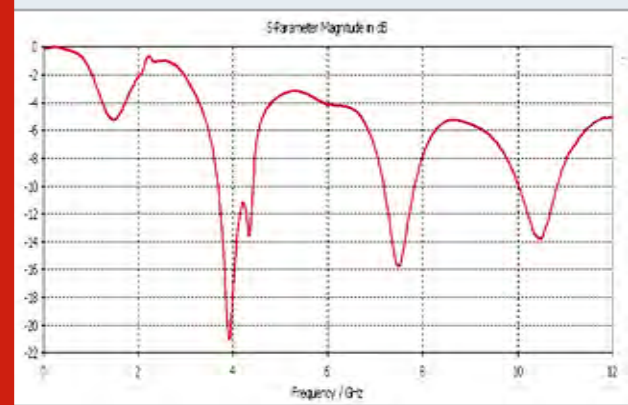
Antenna Results and its Performance: We investigate the designed antenna performance whose substrate thickness and dielectric constant are 2.9 mm and 1.7 respectively. The antenna simulated with IE3D software and we found the triband frequency pattern .The S_{11} parameter results with different frequencies shown in Figure 3.We obtained the three band of frequencies from this proposed textile antenna are 3.561-4.796 GHz, 7.141 -7.813 GHz and 10.12–10.91GHz.Also the textile antenna has achieved the directivity is about 7.123dBi at resonance frequency at 3.624GHz.At resonance frequency 3.624GHz the S_{11} parameter value is -20.65 dB. We found that the maximum percentage of bandwidth at resonance 3.624GHz is about 34%.The proposed textile antenna has the different parameters results at different band of resonance frequencies as given in Table 2.

The 3D radiation pattern for different band of frequencies shown in Figure 4.The different values of directivity of the three bands of frequencies are shown in Figure 5.Here it is observed that at the frequency 3.624GHz, maximum directivity was found .This maximum value of directivity is 7.12dBi. Now we fabricate the proposed textile antenna and measured the different parameters .The variation results of S_{11} parameter with resonance frequency are compared with the simulated results obtained by IE3D simulator. The comparison results shown in Figure 6. We study the bandwidth and losses of the proposed antenna. Textile material is very flexible

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Figure 4: S_{11} parameters and frequency characteristics of proposed Textile antenna with foam substrate.

(a)

(b)

(c)

Figure 5: 2D radiation pattern at (a) 3.624GHz (b) 7.588GHz (c) 10.254GHz of proposed Textile antenna.
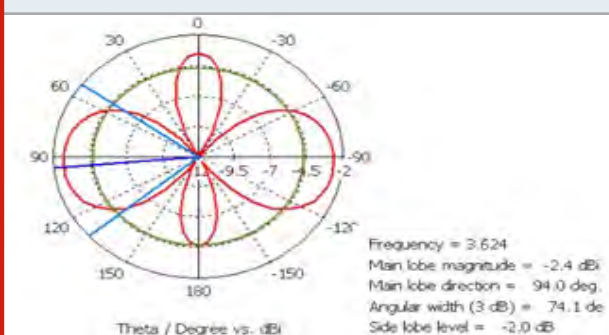
(a)
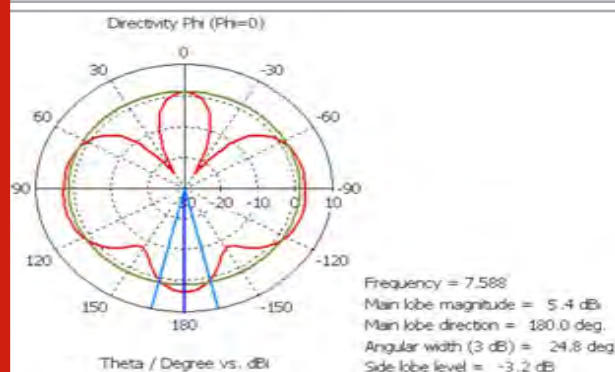
(b)
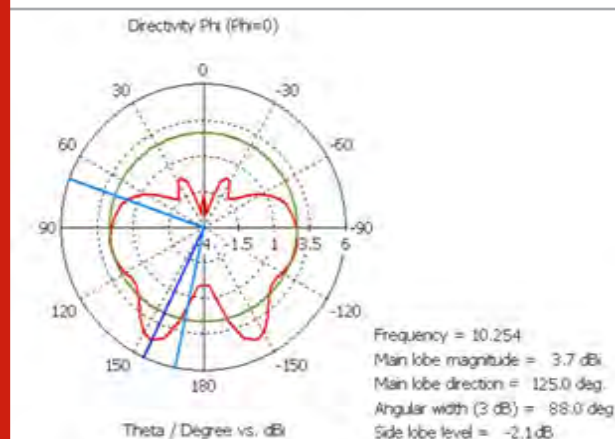
(c)

Figure 6: Comparison characteristics of simulated and measured results of textile antenna

in nature. So triband variation of the textile antenna has been easily analyzed.

CONCLUSION

In the present paper, a triband textile microstrip antenna has been studied and the substrate of the proposed
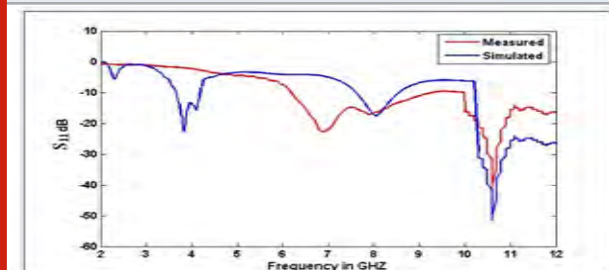
antenna designed with foam substrate material. The Antenna performance obtained by analysis the results. The different radiation patterns obtained for various frequencies. The proposed antenna provides three different band of frequencies .We obtained large impedance bandwidth is about 34% with high directivity. So this textile antenna is most suitable and compact for multiband application in wireless power transmission.

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Effectiveness of Peer Assisted Learning Strategies (Pals) in Teaching of Science

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ABSTRACT

Peer Assisted Learning Strategies (PALS) is a peer tutoring technique in which students work in pairs. This addresses the challenges faced by teachers in reaching all the students in the classroom. This study attempts to see the effectiveness of PALS in Teaching of Science among students in Grade VII. This paper can give an insight to Teachers, Teacher Educators and Researchers those who are searching for effective teaching strategies.

KEY WORDS: PALS, PEER ASSISTED LEARNING STRATEGIES, PEER TUTORING, STRATEGIES FOR TEACHING, TEACHING OF SCIENCE.

INTRODUCTION

Diversity in the classroom creates special challenges to teachers. Teachers need more effective strategies to reach children with different abilities and learning styles. Peer Assisted Learning Strategies (PALS) is a Peer tutoring technique in which it supplements the core curriculum through intervention. This is an evidence based approach and fits with many instructional methods and helps the teachers to address all kinds of students in the classroom. Moreover, PALS would be beneficial to teachers for teaching science and can target students who need more support.

In PALS, Students will work together in pairs to study and then answer questions through different activities provided in the program. As a facilitator the teacher monitors the whole program, extends support wherever necessary and provides feedback. Paired teams are not assigned randomly but rather high-achieving students are paired with average-achieving and likewise average-achieving with struggling learners. Students in pairs help and motivate each other to achieve the goal. Hence this study was conducted to find the effectiveness of PALS in teaching Science.

Objectives
- To find the effectiveness of PALS intervention in Teaching of Science
- To study the impact of PALS intervention in Teaching of Science with respect to Gender and Medium of Instruction

METHODOLOGY

The study was conducted in secondary schools in Coimbatore district. The sample was selected from GradeVII Students for both Experimental and Control Group.Both groups had similar in type of school and

location. This paper discusses the effect of PALS conducted in an Experimental group.

Pre test was conducted before starting the intervention. Based on the pretest score, the students were paired. The student with the highest marks was paired with the student of the lower marks. The students will act as a Tutor and Tutee. The Investigator had taught a lesson from their science textbook and provided sample scripts for students to practice the roles. The tutor and tutee reciprocated the roles and the teacher monitored and provided feedback. Reading is the first step in the intervention in which each student in a pair took turns to read the text. Each student took turns to reread and the first reader restated the main idea of the paragraph in ten words. After five minutes, the students switched roles and restated the main ideas in the second paragraph.

In Paragraph Shrinking, both the tutor and tutee were asked to underline the sentences provided in a worksheet and then they were to discuss the underlined sentences to clarify and evaluate. After this phase, a quiz was given to tutees by tutors to practice what they have learnt. This method will make them comfortable asking questions to another student rather than to a teacher. As the last step a project was assigned to each pair. With collaboration and cooperation they have to complete the task and should present it in front of all the groups. The investigator evaluated the project and gave feedback. Post test was conducted, the scores were analyzed and the results were given below.

RESULTS AND DISCUSSION

The table 1 reveals that the t – value of PALS was significantly different between pre and post mean scores at 0.01 level. Therefore, the null hypothesis stated as "There is no significant difference in the Mean Scores of PALS before and after intervention" is rejected stating that the PALS made significant influence in Teaching and learning Science.

Table 1. Pre and Post Test mean scores of PALS

Variable	Testing	N	Mean	Std. Deviation	Std. Mean Error	t-Test
Score	Pre Test	30	7.27	2.288	0.418	0.000**
	Post Test	30	18.83	4.786	0.874	

** Significant at 0.01 level

Table 2. Pre and Post Test mean scores of PALS with respect to Gender

Testing	Gender	N	Mean	Std. Deviation	Std. Error Mean	t-Test
Pre Test Score	Male	15	7.80	2.305	0.595	0.932^{NS}
			6.73	2.219	0.573	
Post Test Score	Female	15	19.13	5.181	1.338	0.529^{NS}
			18.53	4.518	1.166	

^{NS}– Not significant

Table 3: Pre and Post Test mean scores of PALS with respect to Medium of Instruction

Testing	Medium	N	Mean	Std. Deviation	Std. Error Mean	t-Test
Pre Test Score	Tamil	16	6.81	2.664	0.666	0.157^{NS}
			7.79	1.718	0.459	
Post Test Score	English	14	18.25	5.196	1.299	0.613^{NS}
			19.50	4.363	1.166	

^{NS}– Not significant

It is clear that while comparing the Pre and Post test mean scores of Male and Female it reveals that t- value (t = 0.932, t = 0.529) for both tests are not significant. Therefore, the null hypothesis stated as "There is no significant difference in the Pre and Post Test mean scores of PALS with respect to Gender" is accepted.

There was no significant difference in the comparison of Pre and Post test means scores of PALS with respect to Medium of Instruction. Therefore, the null hypothesis stated as "There is no significant difference in the Pre and Post Test mean scores of PALS with respect to Medium of Instruction" is accepted.

CONCLUSION

Application of PALS can be beneficial to all the teachers who search for new ways to enhance learning. PALS bridges an important gap in learning and reading. This study results showed that PALS is found to be effective in teaching science. Diversity in learning can be addressed through this intervention strategy.

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Measures in Controlling of Contamination by Covid-19 in Dental Office

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ABSTRACT

On 31 December 2019, the World Health Organization (WHO) was informed of cases of pneumonia by unknown microbial aetiology. It was associated with Wuhan City, Hubei Province, China. Later, WHO declared that a novel corona virus had been recognized in samples taken from these patients and it spread rapidly around the world was called Corona Virus disease 2019 (COVID-19). On 11 March 2020, WHO declared it as a pandemic. Clinical trials and investigations are ongoing to learn more about the virus and its management. In oral healthcare, aerosols are generated during dental treatment and COVID-19 spreads by respiratory droplets and also by aerosols. Airborne contamination should be controlled by triage, engineering, and workplace controls followed by personal protection equipment (PPE) which are necessary for oral health care workers.

KEY WORDS: COVID-19, PERSONAL PROTECTION EQUIPMENT (PPE), WORLD HEALTH ORGANIZATION (WHO).

NINTRODUCTION

COVID-19 is a family of enveloped RNA viruses which cause illness in people such as common cold, severe acute respiratory syndrome [SARS], Middle East Respiratory Syndrome [MERS]. Characteristic features of this disease include fever, cough, dyspnoea, Myalgia, Nausea, Diarrhea, hyposmia, dysgeusia, abnormal chest X-ray and computed tomographic (ground-glass opacities are typically found in the chest) while some patients may be asymptomatic. SARS COV 2 can be diagnosed by Conventional or Real Time RT-PCR test. Sample should be taken from throat and nasal swab, bronchoalveolar lavage, sputum and tracheal aspirate which is collected in Viral Transport Medium and transported in cold chain. Antibody based tests for detection of antibody (IgM and IgG) against SARS COV 2 can be used as a diagnostic test, which is rapid and cost effective. The incubation period of COVID-19 is in between 1 to 14 days with a median of 5 to 6 days. Complications of this disease include multi-organ failure, pulmonary edema, septic shock, severe pneumonia, and acute respiratory distress syndrome.

The pathophysiology of COVID-19 is not fully known; however, it has been noted that SARSCoV-2 binds to the angiotensin-converting enzyme-2 (ACE2) receptor in humans, which is a similar pathogenesis as SARS.[1,2] It has a unique structural feature of the spike glycoprotein receptor which is responsible for the entry of the virus into host cells. It spreads person-to-person in community and healthcare settings with local transmission. The virus exists on plastic and stainless steel for 72 hours, on copper for 4 hours and on cardboard for 24 hours.[3] In dentistry, a lot of rotary and ultrasonic instruments are used which make direct contact with hard tissues. Often,

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these instruments are used in conjunction with air, water, or both which leads to the generation of aerosols, fine particles, and splatter. Severe acute respiratory syndrome (SARS) and COVID-19 are transmitted by respiratory droplets and aerosols from infected individuals.

With the occurrence of new pathogens, the risk of respiratory diseases in oral healthcare workers has exponentially increased.[4] So, all aerosols generating practices should be limited in oral healthcare settings and correct personal barrier protocols should be followed.[5]. Thus, this review article reported the characterisation of aerosols in dental procedure and the general measures or method of reducing the burden of aerosols, to prevent transmission of corona virus through surfaces in dental office.

Definition and Characteristic features of Aerosol in Dentistry: Aerosols are defined as "liquid or solid particles that are present in the air and produced by humans, instruments, machines or animals and bio-aerosols are aerosols that contain particles of any kind of organisms."[6] The term 'aerosol' and 'splatter' was first introduced by Micik et al.[7] They reported that the particles size of aerosol is <50 μm in diameter and particles size larger than 50μm in diameter are defined as splatter. They also said that particles from 0.5 to 10 μm have the greatest potential for infection transmission. Aerosols cause the greatest threat in dentistry because it stays in the air and may enter in respiratory passages. After completion of the procedure, it may suspend in the operatory for about 30 min. All procedures which are carried out by engine-driven or ultrasonic devices generate aerosols and these aerosols contain body fluids which include saliva, blood and microbes.

Results were obtained in many studies to confirm that "aerosols are contaminated with microbes". Harrel SK and Molinari J in 2004[8] and Jacks ME[9] in 2002, reported that droplet nuclei expelled from patient suffering from Mycobacterium tuberculosis is most serious potential threat in aerosols. Zemouri et al.[6] in 2017 stated that high serological titers of Legionella spp. and high rates of asymptomatic tuberculosis is found in dental practitioner and hospital staff, and also Pseudomonas species were found in aerosols from the instruments in contact with tap water. Zemouri et al., Harrel et al. and Kobza et al.[6,8,10] reported in their study that nasopharyngeal and saliva secretions in aerosols and splatter consists influenza virus, SARS virus (Severe acute respiratory syndrome), pathologic streptococci and staphylococci along with hepatitis B and C virus and HIV. Fungi from Cladosporium and Penicillium species were most commonly found. Baseer et al.[11] in 2016 confirmed that MERS-COV(Middle East respiratory syndrome – corona virus) transmitted through droplet and contact, and healthcare professionals were worst affected. Thus, the knowledge of the composition of aerosols and splatter is very important for safety of oral healthcare professionals.

Prevention: Personal Protective Equipment for Dental Practitioners - Protective equipment contains standard PPE kit, goggles, face protection, face shield, gloves, mask, gown or coverall, head cover, and rubber boots to protect eye, oral, and nasal mucosa.[12,13].

Surgical masks and surgical respirators are very important to wear during procedure but they fail in respiratory protection due to lack of tight seal.[14,15] The mask should be changed for each patient every hour of long treatment and in every 20 min in highly aerosolized environment.[4,15] Respirators used should be certified by the National Institute for Occupational Safety and Health.[4] There are three types of filter class-N95 (Non-resistant to oil), R99 (Resistant to oil) and P100 (Oil Proof particles). Surgical respirators are designed to filter the particles size of 0.3μ.

Cleaning of Potentially Contaminated Surfaces: The dental office surfaces can be broadly divided into high touch and low touch surfaces, which depends on frequency of contact and risk of exposure. The high touch surfaces may include door handles, faucet knobs etc. and high risk surfaces may include dental chair. Low touch or low risk surfaces include floor, ceiling, walls etc. High risk surfaces should be cleaned and disinfected after every patient attended and low risk surfaces may be cleaned and disinfected at the beginning and end of the day. 70% isopropyl alcohol based disinfection is preferred for metal surfaces. Plastic surfaces can be disinfected by 1% hypochlorite solution. Floor wet mopping can be done by using 1% hypochlorite solution. Triple bucket system should be preferred. Walls up to seven feet to be disinfected by 1% hypochlorite solution. Hydrogen peroxide based wipes can be preferred in high risk areas.

Use of Mouth Rinses: To reduce the burden of microbes during dental treatment, 0.1% chlorhexidine should be used for 1 minute during preprocedural rinse.[16] It has been shown that, it significantly decreases the count of floating bacteria in the mouth.[17] For influenza virus and SARS-coronavirus, 1% hydrogen peroxide or 0.2% povidone iodine mouthwash should be used in patients with high viral load.[18] For cleaning dental unit waterline (DUWL), 3-ppm sodium hypochlorite, 0.12 CHX, 1:10 dilution of listerine mouthwash, and 1% hydrogen peroxide should be used.[16].

Use of HVE and rubber dam: The use of high-volume evacuator (HVE) reduces 78% of airborne contamination. [9,19] Jacks ME reported that 90% aerial contamination should be removed alone by HVE.[9] They also reported that the contamination of bacteria when using air turbines or air–water syringes can be kept minimum using a rubber dam. Use of rubber dam in practising helps in eliminating all the bacterial and viral contamination which arise from the blood and saliva except for the tooth to be working upon.[19].

Use of negative pressure rooms or airborne infection isolation rooms: Emergency dental treatment of patients

with active or suspected infections by SARS and COVID-19 should not be carried out in routine dental settings, instead these patients should be treated in negative pressure room or airborne infection isolation room by using mask or respirator.

Dental ventilation guidelines which is given by Indian health service has reported the specific ventilation requirements in dental facilities.[20] Air change per hour (ACH) corresponds to air volume added to or removed from a space divided by the volume of the space. For enclosed operatories minimum ACH is 12 and 6 for open operatories. Rautemaa R et al stated that 63% of aerosols are eliminated from the environment, if proper air change ratio is maintained.[21] Spagnolo AM et al revealed that high-efficiency particulate arrestor (HEPA) filters eliminate the contaminants size 0.3 μ and greater with 99.97% efficacy with laminar airflow.[22] Singh S et al also stated that HEPA filters reduce the concentration of airborne particles as well as in disease transmission. [16].

CONCLUSION

In oral healthcare settings, generation of aerosols and splatter has the ability to spread infection. It can be reduced to a substantial level but cannot be completely avoided. Sars-CoV-2 is a very infective virus. Because of the oral route of transmission of this pathogen dentists are among the health professionals who are at high risk of exposure. So, triage, initial screening, and special precautions should be taken while treating them.

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A Study on Adapting Green Techniques in Software Engineering Process to Reduce Energy Consumption.

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ABSTRACT

Technology is emerging day by day and also the usage of software too in all sorts of fields along the globe. The primary concern in the world now is pollution due to natural disasters and also by the man made inventions for living modern life in society. During usage the carbon emitted from these devices will have higher impact on the overall pollution of the world .So we indeed have to find a solution to minimize the CO_2 emission from these devices by implementing sustainability in every activities of software development process by applying different JIT green techniques in it. In this paper the section one introduces what is need of green software engineering and its best practices, the section two introduces best practices for sustainable software and energy efficient framework of software ,the section three describes green implementation of different software process methodologies and the final section will show the improvements after implementing green techniques in life cycle.

KEY WORDS: GREEN COMPUTING, CARBON FOOTPRINT, VIRTUALIZATION, GREEN DATA CENTERS.

NINTRODUCTION

There is tremendous changes in the environment due to global warming and it became an issue to the government and private sectors as they have to abide the regulations of environmental protection schemes.so everyone is finding ways to green every activity of work performed by the organization. Also, now every individual has to take onus for healthful adaptation sustainable practices to reduce the energy consumption at home. The developers and the end users are having different perspective in case of Energy consumption of devices, the developers says that due to battery users and the end users generally think, it is due to the application programs. As more recently, economically sensible energy conservation is required.

The insight for this change comes from a) increase in awareness of global warming issues like GHS b) and increasing sense of national Energy saving security c) growing business process needs prevention of cost and energy in activities of business process d) obtaining an efficient software and hardware[2]will indirectly reduce the perverse effect in the environment.[4] For this, we need to consider a software engineering process development steps [4] in order to obtain sustainable and green software products [6]which help to minimize the negative impacts on the environment. Hence, it is possible to help and guide project managers, engineers, developers and users to better collaborate to produce efficient software applications using eco-friendly environment [8].

Green software and Software Engineering: Software: is a set of instructions or programs instructing a computer to do specific tasks as per the requirement of the user. Green software: "It's is a software made and used and

used to reduce environmental issues", provided by Murugesan in Harnessing-Green-IT Practices. Green Software: Green software to full-fill the following three high level requirements: a)The required software engineering activities of software development, maintenance, and disposal must save resources and reduce waste. b) Software execution must save resources and reduce waste. c) Software must support sustainable development.

Green sustainable –software engineering: is the skill of creating green and sustainable software in relation to the process of green software engineering. The skill of describing and making software products in a way, the positive and negative effects on sustainable developments of the Life Cycle process constantly assessed. The assessed details are maintained as records and may be utilized for a software product process optimization.

Best practices and sustainable software [02]: Can be for green implemented in all aspects of software development.

a) Defer initialization of till we need it for execution
b) Efficient data traffic to transfer data without delay
c) Decrease algorithmic complexity to keep the software with less space and time
d) Power down peripherals to reduce the energy consumption d)Efficient UI to interact the system faster
e) Efficient query to retrieve the data rapidly
f) Load balancing to distribute data and reduce overloading
g) Virtualization
h) Just-In-Time compiler to enhance execution i) Reduce transparency.

Related Study

1.3.1.Gustavo Pinto, Fernando Castor,2017,In this paper[13] The major issue in preventing software developers from identifying, fixing, refactoring as well as the removal energy consumption hotspots are the insufficiency of knowledge and the non-occurrences of tools . These problems is handling both the problems. Also further they discussed about, the relationship between software and energy consumption. Energy consumption (EC) is an accumulation of power dissipation (PD) over time t, that is, $EC = PD \times t$. Power PD is measured in watts, whereas energy EC is measured in joules. As an example, if one operation takes 20 seconds to complete and dissipates 10 watts, it consumes 100 joules of energy. Also we need to consider on the software which are in under execution, hardware platform, given context also during a given time. To understand the importance of a hardware platform, consider an application that uses the network. Any commodity smartphone nowadays supports, at least, Wi-Fi, 3G, and 4G.

1.3.2. Shantanu Ray,2013,The impact [14] of carbon emission and the necessity of sustainability in software development is mentioned. Using methods SCRUM, Extreme programming and Sprint helps in minimizing the problems related to the efficiency and flexibility .Suggested visualization of server and use natural resources for energy consumption. Monitor the energy difference through normal energy and adaptation of sustainable natural energy. They also proposed a tool OGSA-DAI-used in university of Edinburgh to enhance optimization.it is a sustainable software ,and create during better user interface.it is an innovative user interface and provided with innovative solution for data access management.

2.0.Green Design and coding in Life Cycle: Focus on creating green and sustainable software in relation to the process of it.The skill of describing and making software products in a way, the positive and negative effects on sustainable developments of the Development Life- Cycle process constantly assessed. The assessed details are maintained as records and may be utilized for a software product process optimization [2].

2.1: A Framework for Energy–Efficient Software: Software energy consumption plays a vital role in minimize carbon footprint. Initially, the hardware and software were tightly mingled and mostly indistinguishable. But now the hardware and software are varying, the number of software layers is constantly increasing to provide encapsulation and abstraction for software applications We can develop a green software by applying green analysis ,design, building and testing (fig:1) and perform the energy reduction from the developing stage, from the end user side as well as the customer side by collecting requirement to measuring the energy profile at every phases of the software development to enhance the software.

Figure 1: Green software Engineering Frame work
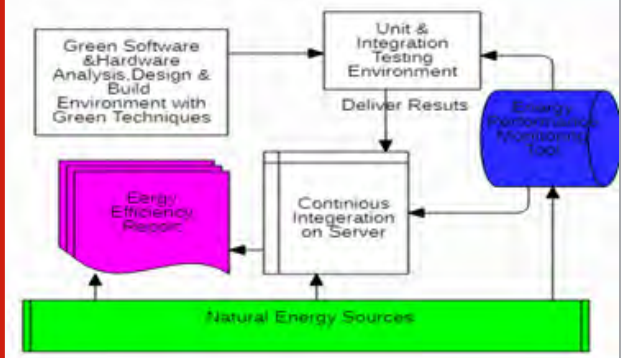
Also, Different Natural energy sources[13]should be provided to the system to reduce power consumption .There are several models and techniques available to

measure the consumption of in processor, memory, storage ,network and peripheral devices.

3.0: Reducing The Energy Through Green Software Engineering Life Cycle:
To implement energy efficient software engineering process ,need to implement green activity every stages of the life cycle.

3.1. Green Requirements phase:
It is initial phase of software development process analyses, trace, prioritize, and agree, and communicate to all stakeholders on functional and technical specifications. Plan for energy efficiency at all levels of software. Developers strike with issues for applying green during the development of product that due to lack of tools, guidelines, textbooks. Considering the power states of software, applying energy saving technique like computational &Idle efficiency and Data efficiency.

3.3. Sustainable Green Design coding:
Design should consider hardware and software level. The coding style should be optimized and can have automatic code generators to save time in developing the process for maintaining the complete coding as clean code There is misconception that by reducing the execution time ,will reduce execution time, but it actually increases the context switching and increase the CPU execution cycles. Also can adapting energy efficient agile programming practices.

3.4 Green Testing Distribution and disposal:
Perform testing with efficient test cases, Have energy profiler modules. To find the energy consumption of application unit testing level to integration level. In case of higher computation sent to the remote computer similar like mobile offloading.

Table 1. Devices chosen for power adjustments		
S.no	Power Management Features Enabled systems	Number of Devices
1)	Number of desktop computers	100
2)	Number of desktop monitors	100
3)	Number of notebook computers	50
4)	Number of notebook displays	50

4.0. Applying green power management techniques in software to reduce energy consumption in the devices:
A software tool called carbon calculator is used to evaluate the power consumption and co2 emission. In Table1.the total number of devices used for the power adjustment is given.

After selecting the number of devices for the experiment. We need to set parameter for the desired power

management to Desktops –Monitor and computer as well as to the notebook display and the computer are shown in table2.

Table 2		
Desktop Monitor	Low power sleep mode in minutes	15min
Desktop Computer	System Standby /Hibernate mode in minutes	30min
Notebook Screen	Low power sleep mode in minutes	15min
Notebook Computer	System Standby /Hibernate mode in minutes	30min

Table 3. PC usage in organization		
1)	Number of hours work in day?	8 hrs
2)	How many days in a work week in your organization	5 days
3)	How many days leave in organization in an year.	22 days

Table 4. Result of energy saving.		
Saving criteria	Energy (kWh)	Prevention of Co2
Desktop monitors transcended sleep mode:	16,849.2	38.9
Notebook displays transcended into sleep mode:	1,741.9	4.0
Total energy reduction from	18,591.2	42.9
Notebook computers going into sleep mode	22,328.6	51.6
Total savings from computer sleep mode	1,658.8	3.8
Total energy saved on the computer during sleep mode	23,987.4	55.4
Total saving	42,578.6	98.4

After setting the parameters in the system components in the organizations ,we need to find the amount of working hours and number of days in a week the organization is working as well as how many number of holidays in the organization, In order to find the devices used Table-3,so that it help as the find the usage of devices able 2: Power adjustments parameters. total energy saved prevention of carbon emitted can observed in Table 4.

CONCLUSION

The main challenges of the current are the global impacts of the environment are due to electronic devices. For developing the software application. This work proposes a new software model where focus is only on energy efficiency and energy consumption sustainability in every activities system. In future research can be conducted on implementing enhanced energy efficient metrics.

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Optimal Robust Design for Wood and Berry Distillation Column Using Multiobjective Genetic Algorithm Tuned Model Predictive Controller

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ABSTRACT

Distillation column is the most common and frequently used process in chemical engineering. Improved control strategy can help reducing the cost and improving the quality of the product. Main concern in distillation column is the purity of output product. An optimal robust design has been implemented for Wood and Berry distillation column, a multivariable system with dead time. To achieve the desire robust response and tracking performance, infinity norm of the sensitivity function $(\|S(jv)\|)_{\infty}$ and infinity norm of complementary sensitivity function $(\|T(jv)\|)_{\infty}$ *are minimized simultaneously using multi-objective genetic algorithm (MOGA). By tuning of the Mo*del Predictive controller (MPC) parameters using MOGA, an optimal set of solutions are generated and the ideal solution is selected from the Pareto optimal set using level diagrams. From the simulation results it is clear that MOGA tuned MPC is robust in nature and it also performs the proper tracking of the desired distillation composition and bottom composition in wood and berry system.

KEY WORDS: MODEL PREDICTIVE CONTROL, MULTI-OBJECTIVE GENETIC ALGORITHM, CONTROL HORIZON; PREDICTION HORIZON, ROBUST CONTROL, MULTI INPUT MULTI OUTPUT, WOOD AND BERRY SYSTEM.

INTRODUCTION

Wood and Berry distillation column is widely used in the petrochemical applications. Distillation process is one of the important aspects in process industries, to improve the quality of the process and reduce the cost. Prime aim in distillation column is purity of the liquid/chemical. Quality of the product and profit of the industries are directly dependent on the tuning of the control system.

Distillation process is multi input multi output (MIMO) system with dead time. Due to interaction part in MIMO system, it becomes difficult to design the controller for a system with interaction. It will increase the wastage of the input raw material and also affect the quality of the product. Distillation column generally has a time delay or dead time, which makes the system design more challenging.

Model Predictive Control (MPC) is an optimal control strategy based on the mathematical optimization of the performance index. Moving horizon control (MHC) is one of the well known names of MPC and it is prominent for the control dynamical system eg. Chemical plants, process control, gas pipeline control etc. At each control interval the controller optimizes the performance index of the plant by estimating the future response of the plant and future manipulated variables.

MPC has become one of the best computer controlled algorithm that are currently used in industries, because of the computational technique of MPC that has improved the performance of the process [1], [2], [3], [4], [5]. The main advantage of the MPC is that it gives better response for multi input multi output (MIMO) system with large number of control variables. Generalized MPC for MIMO system using the state space interpretation is proposed by A. Gambier [1]. While tracking, error is minimized over prediction horizon with constraints on the input, states and the output of the system. The settling time required in a system must be less than the prediction horizon, because if it is greater than the prediction horizon the system will have oscillations in the response, for the further change in the input.

R. Shridhar et al. [6] explains the concept of tuning the SISO DMC parameters for unconstraint SISO DMC for the 1st order plus delay time (FOPDT) system of the process dynamics. Here FOPDT model approximation is used for the tuning rules such as Cohen-Coon, Integral time absolute error (ITAE), and integral absolute error (IAE) for PID implementations. MIMO system has been simulated by R. Galindo et al. [7] with uncertainty is explained by Wolfgang Ponweiser et al. [8] and F. Abdollahi et al. [9] develop a new technique based on the worst case minimization.

Andrea Richter et al. [10] explained the tuning parameter of different controllers that are used together in multi-loop control system by optimizing the different single objective functions e.g. ISE, ITSE and ISTSE. The concept of the gain scheduling control strategy for the multivariable MPC is demonstrated by V.R.Ravi et al. [11]. The tuning of the multiple linear MPC for the Two Conical Tank Interacting Level System is done using real coded genetic algorithm (GA). One of the linear MPC controller output is selected as gain scheduling adaptive controller's output based on the current value of the measured process variable. A robust MPC controller design over infinite horizon for the online optimization has been formulated by V. Ghaffari et al [12], by posing it as worst case optimization problem using LMI.

MPC is used for the proper tracking of the reference signal; optimization of the performance indices is solved using the gradient. Based on this gradient, a second order approximation of the economic function is obtained and used in the MPC optimization problem resulting in a convex optimization problem. Recursive feasibility and convergence to the optimal equilibrium point is ensured by D. Limon et al. [13]. In this paper multi-objective genetic algorithm (MOGA) tuned model predictive controller (MPC) is considered for the robust control and proper tracking of top and bottom composition of distillation column of Wood and Berry distillation column. To assure robustness and tracking of the system, the controller design problem is formulated as $\left(\| S(jw) | \right)_{\infty}$ as first objective and as the second objective of the system.

Mathemetical Modeling of Wood and Berry System: Wood and Berry [14] in 1973 performed a test to find out the mathematical model of distillation column having a diameter of 9 inches and 8 tray column with a condenser and a basket type reboiler. The output composition (Top composition and bottom composition) are controlled by regulating the inputs (Reflex and Steam).

Mass balance equation of the distillation process is given below.

$$MassRate_{in} - MassRate_{out} = MassAccumulated$$

Various components of the distillation column are given below. Condenser and Reflux Drum.

$$\frac{dM_D}{dt} = V_{NT} - (R + D_L + D_V) \tag{1}$$

$$\frac{dM_D X_D}{dt} = V_{NT} Y_{NT} - (R + D_L) X_D - D_V Y_D \tag{2}$$

Top Tray

$$\frac{dM_{NT}}{dt} = R + V_{NT-1} - L_{NT} - V_{NT} \tag{3}$$

$$\frac{dM_{NT} X_{NT}}{dt} = X_D R + V_{NT-1} Y_{NT-1} - X_{NT} L_{NT} - V_{NT} Y_{NT} \tag{4}$$

n^{th} tray

$$\frac{dM_n}{dt} = L_{n+1} - L_n + V_{n-1} - V_n \tag{5}$$

$$\frac{dM_n X_n}{dt} = L_{n+1} X_{n+1} - X_n L_n - V_{n-1} Y_{n-1} - V_n Y_n \tag{6}$$

Feed Tray

$$\frac{dM_{NF}}{dt} = L_{NF+1} - L_{NF} + V_{NF-1} - V_{NF} + F_L \tag{7}$$

$$\frac{dM_{NF} X_{NF}}{dt} = L_{NF+1} X_{NF+1} - X_{NF} L_{NF} - V_{NF-1} Y_{NF-1} - V_{NF} Y_{NF} + F_L Z_L \tag{8}$$

Bottom Tray

$$\frac{dM_1}{dt} = L_2 - L_1 + V_B - V_1 \tag{9}$$

$$\frac{dM_1 X_1}{dt} = L_2 X_2 - L_1 X_1 + V_B Y_B - V_1 Y_1 \tag{10}$$

Reboiler

$$\frac{dM_B}{dt} = L_1 - V_B - B \tag{11}$$

$$\frac{dM_B X_B}{dt} = L_1 X_1 - V_B Y_B - B X_B \tag{12}$$

Condensation Tank

$$\rho A \frac{d(H_T)}{dt} = LT - (L+D) \tag{13}$$

Reboiler Tank

$$\sigma A \frac{d(H_B)}{dt} = L_1 - B \tag{14}$$

Heat Balance equation is given by

$$HeatRate_{in} - HeatRate_{out} = HeatAccumulated$$

Energy balance on n^{th} tray.

$$\frac{M_n C_n d(h_n)}{dt} = H^L_{n+1} L_{n+1} - H^L_n L_n - H^V_{n-1} L_{n-1} - H^V_n L_n \tag{15}$$

Energy balance on reboiler

$$\frac{M_{NT} C_{NT} d(T_{NT})}{dt} = L_{NT} C_{NT} V_{NT-1}(T_{NT-1} - T_{NT}) - H^V_{NT-1} V_{NT-1} - QC \tag{16}$$

All the nomenclature used in wood and berry distillation column with units are specified in Table 1.

Table 1. Nomenclature and Units		
Symbol	Name	Unit
R	Rate of the Reflux Flow	Kg per hr
D	Rate of the top product Flow	Kg per hr
V_{NT}	Rate of the vapor Flow	Kg per hr
M	Value of Liquid Holdup	Kg
L_{NT}	Rate of Liquid Flow	Kg per hr
X,Y	Liquid and Vapor weight fraction	-
n	No. of trays	-
F	Rate of Feed Flow	Kg per hr
Z_L	Concentration of Feed Flow Rate	-
B	Rate of Bottom Feed Flow	Kg per hr
P	Liquid Density	Kg per m3
A	Storage tank area	-
H_n	Enthalpy of Liquid on the Tray	Kg per hr
H^L_n	$C_n T_n$	
H^V_n	Enthalpy of Vapor on the Tray	Kg per hr
C_n	Heat Capacity of nth Tray	Kg/hr °C
T_n	Temperature Capacity n^{th} of Tray	°C
QR	Heat Supply to Reboiler	KJ per hr
C_1	Heat Capacity of residual bottom column	KJ/hr °C
QC	Amount of Heat reduced in condensation	KJ per hr
NT	Heat capacity of distilled condensation	Kg/hr °C

Below mentioned depicts the transfer function of the wood and berry distillation column [14].

Figure 1: Wood & Berry distillation column.
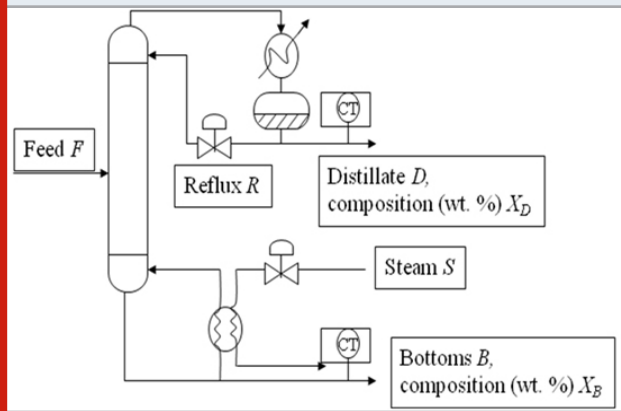
$$\begin{bmatrix} y_1(s) \\ y_2(s) \end{bmatrix} = \begin{bmatrix} \dfrac{12.8e^{-s}}{16.7s+1} & \dfrac{-18.9e^{-3s}}{21s+1} \\ \dfrac{6.6e^{-7s}}{10.9s+1} & \dfrac{-19.4e^{-3s}}{14.4s+1} \end{bmatrix} \begin{bmatrix} u_1(s) \\ u_2(s) \end{bmatrix} \tag{17}$$

where:
y1 = XD = Distillation Composition (%MeOH)
y2 = XB = Bottom Composition (%MeOH)
u1 = R = Reflux flow rate, lb/min.
u2 = S = Reflux flow rate, lb/min.

MPC Formulation: Consider the system has n states, p inputs and q outputs. It is arduous to control each output individually, with no difference in the actual output and desired output in steady state, if number of inputs is less than number of outputs in system. Here design uses the predicted process output (y), which optimizes objective function, J. Measurement noise v(k) is considered in the mathematical formulation of the problem.

$$x_p(k+1) = A_p x_p(k) + B_p u(k) \tag{18}$$

$$y(k) = C_p x_p(k) + v(k) \tag{19}$$

Figure 2: Flowchart representation of Multiobjectve Genetic Algorithm.
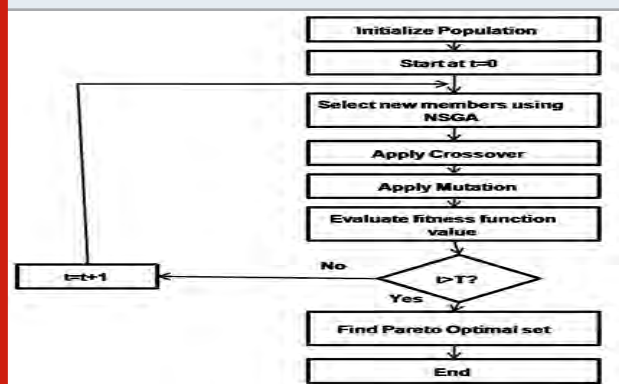
where $x_p(k)$ is the state variable. $v(k)$ is the measurement noise, which is random in nature. where A_p, B_p and C_p are the matrices corresponding to Equation 18 and 19. The tracking cost function which penalizes the increment in the change in control action (Δu) and error (e), which is represented by J.

$$J = \sum_{j=0}^{j=N_p} \| y(k+j|k) - r(k+j|k) \|^2_{Q(j)} + \sum_{i=0}^{i=N_c-1} \| \Delta u(k+i|k) \|^2_{R(i)} \qquad (20)$$

Where

$$e(k+j|k) = r(k+j|k) - y(k+j|k) \qquad (21)$$

$$Y(k) = \begin{bmatrix} y(k) \\ y(k+1|k) \\ . \\ . \\ . \\ y(k+N_p|k) \end{bmatrix}; \quad T(k) = \begin{bmatrix} r(k) \\ r(k+1|k) \\ . \\ . \\ . \\ r(k+N_p|k) \end{bmatrix}; \quad \Delta U(k) = \begin{bmatrix} \Delta u(k|k) \\ \Delta u(k+1|k) \\ . \\ . \\ . \\ \Delta u(k+N_{c-1}|k) \end{bmatrix};$$

$$Q = \begin{bmatrix} Q(0) & 0 & . & . & 0 \\ 0 & Q(1) & . & . & 0 \\ . & . & . & . & . \\ . & . & . & . & . \\ 0 & 0 & . & . & Q(N_p) \end{bmatrix}; \quad R = \begin{bmatrix} R(0) & 0 & . & . & 0 \\ 0 & R(1) & . & . & 0 \\ . & . & . & . & . \\ . & . & . & . & . \\ 0 & 0 & . & . & R(N_c-1) \end{bmatrix};$$

$$Y(k) = \Psi x(k) + \Upsilon u(k-1) + \Theta \Delta U(k) \qquad (22)$$

For the stable matrices Υ, Ψ and Θ. Define

$$\varepsilon(k) = Y(k) - \Psi x(k) - \Upsilon u(k-1) \qquad (23)$$

$$\Psi = \begin{bmatrix} A \\ . \\ . \\ . \\ A^{N_p} \end{bmatrix}; \quad \Theta = \begin{bmatrix} B & . & . & O \\ AB+B & . & . & O \\ . & . & . & . \\ \sum_{i=0}^{N_c-1} A^i B & . & . & B \\ \sum_{i=0}^{N_c} A^i B & . & . & AB+B \\ \sum_{i=0}^{N_p-1} A^i B & . & . & \sum_{i=0}^{N_p-N_c} A^i B \end{bmatrix};$$

$$\Upsilon = \begin{bmatrix} B \\ . \\ . \\ \sum_{i=0}^{N_p-1} A^i B \end{bmatrix}; \quad \Xi = \begin{bmatrix} B_d & O & . & . & O \\ AB_d & B_d & . & . & O \\ . & . & . & . & . \\ A^{N_p-1}B_d & A^{N_p-2}B_d & . & . & B_d \end{bmatrix};$$

Robust Design Criteria: Robust design criteria for a wood and berry system is formulated with the maximum singular value of $\|S(j\omega)\|$ and to achieve the tracking performance of the system maximum singular value of is $\|T(j\omega)\|$ taken as the second objective function that is to be optimized simultaneously.

$$J_S = \| S(jw) \|_\infty$$

$$J_T = | T(jw) |_\infty$$

$$(24)$$

Optimization of the JS is done to make the system robust from external noise and disturbances and JT is optimized to achieve the desired tracking performance.

Multiobjective Genetic Algorithm: Real world applications are multi-objective in nature and these objectives are conflicting. In single objective and weighted multi-objective optimization, there exists a single solution, whereas in multi-objective, there exist a set of solutions exists. These optimal solutions are the best solution in the search space where no other solution exist that can give better results in the search space with all the objectives are taken into consideration. GA is an efficient optimization technique which is capable to handle multiple objectives simultaneously.

GA is a computational method inspired by evolution. It's based on the Darwin's theory of "survival of the fittest". At first Rechenberg introduces GA. GA is direct method to find the global best solution in the search space during optimization. The main process of GA consists of natural evolution: reproduction, selection and miscellany of the generation. Initially GA selects a set possible solution or individuals or chromosome which is used to create population. The fitness function value of each chromosome from new generation is calculated to identify if it is better than former generation chromosome or not. Process is performed until a global best solution is obtained. Below flowchart depicts the step by step process of GA [15]:

Tuning of MPC using MOGA: Design objectives represented above in equation 24 are optimized using MOGA to find the optimal values of the MPC parameter [Q, R, NC, NP]. Where Q & R are the weights and NC & NP are the control and the prediction horizon respectively. Bounds of the MPC parameters are Upper Bound (UB): [1, 1, 6, 13] and Lower Bound (LB): [0.001, 0,001, 1, 7] respectively. This range is found by evaluating the optimization function number of times. It is clear from the results obtained that optimum value of the MPC parameters lies within lower and the uppers bounds stated above. Determining the range of the controller parameters makes it easier to identify the best solution in minimal time.

Table 2. Parameters of GA	
Description/Parameters	**Value**
Size of the Population	75
Migration Fraction value	0.2
Size of Tournament	2
Value of Crossover	0.8
Number of Generation	800

Best controller parameters obtained from POS using MOGA are [Q, R, Nc, Np] = [0.7365, 0.0648, 4, 17] and best values of the objective function obtained is $\|S(j\omega)\|_\infty = 1$, and $\|T(j\omega)\|_\infty = 1$. Where $\|S(j\omega)\|_\infty$ gives maximum singular value of sensitivity function

and $||T(j\omega)||\infty$ gives maximum singular value of complementary sensitivity function. Maximum singular value of sensitivity function is equal 1, which depicts robustness of the system, maximum singular value of is equal to 1, which shows proper tracking of the system with no overshoot.

Table 3. Optimum Parameter and Objective Functions obtained for Wood and Berry Distillation Column							
Optimization	Norm	Q	R	Nc	Np	$||S(j\omega)||\infty$	$||T(j\omega)||\infty$
MOGA	1, 2 & ∞-Norm	0.0114	1.6606	3	14	1	1

Table 4. Time Domain Performances for Wood and Berry Distillation Column						
Performances	Input	RT	ST	OS	$||S(j\omega)||\infty$	$||T(j\omega)||\infty$
MOGA (1, 2 & ∞-Norm)	1st	23.12	40.81	0.22	1	1
	2nd	21.45	37.33	0.32	1	1
Q Wang et al. (2000)[16]	1st	3.964	72.24	38.24	2.395	2.45
	2nd	9.48	55.3	23.86	2.174	1.464
Q Wang et al. (1997)[17]	1st	5.192	65.82	26.1	1.909	1.835
	2nd	6.336	61.035	23.99	1.835	1.627
Vu and Lee, 2010 (PI-IMC)[18]	1st	1.48	20.48	15.12	1.666	1.23
	2nd	7.54	24.51	0.53	1.605	1

Table 3 depicts the ideal controller parameters and objective functions obtained by 1, 2 & ∞-Norm of LD, while designing the parameters of the MPC using MOGA. As stated in Table 4, the valves of infinity norm of sensitivity function for 1st & 2nd input of Wood and Berry Distillation Column System designed by MOGA tuned MPC are 1 & 1 respectively, on the other hand $||S(j\omega)||\infty$ value obtained by Q Wang et al. (2000)[16], Q Wang et al. (1997)[17] and Vu and Lee, 2010 (PI-IMC) [18] are 2.395 & 2.174; 1.909 & 1.835; and 1.666 & 1.605 respectively, which shows the value of $||S(j\omega)||\infty$ greater than 1 makes the system less robust in nature. It can be seen form Table 4 that the value of $||S(j\omega)||\infty$ for 1st & 2nd input is improved by 58.25% & 54%, 47.62% & 45.5% and 39.98% & 37.7% in comparison to Q Wang et al. (2000)[16], Q Wang et al. (1997)[17], and Vu and Lee, 2010 (PI-IMC)[18] respectively.

The value of $||T(j\omega)||\infty$ for 1st & 2nd input is 1 & 1 respectively. On the other hand, $||T(j\omega)||\infty$ values for both the inputs obtained by Q Wang et al. (2000)[16], Q Wang et al. (1997)[17] and Vu and Lee, 2010 (PI-IMC)[18] are 2.45 & 1.464; 1.835 & 1.627; and 1.23 & 1 respectively, which shows the value of $||T(j\omega)||\infty$ is greater than 1 that makes the system more vulnerable to noise in comparison to the tuning methods adopted by researcher as it can be seen in the Table 3, that values of the complementary sensitivity function for 1st and 2nd

input are 1 and 1 respectively, which makes the system less vulnerable to noise. It can be seen form Table 4 that the complementary sensitivity for 1st and 2nd input is improved by 59.18% & 31.69%, 45.5% & 38.54% and 18.7% & 0% in comparison to Q Wang et al. (2000)[16], Q Wang et al. (1997)[17], and Vu and Lee, 2010 (PI-IMC) [18] respectively.

So, it can be state that method proposed by researcher for tuning the MPC parameters by MOGA gives the robust stability and better tracking performance with less overshoot in comparison to all other methods. Pareto front of the objective function and controller parameters obtained using MOGA tuned MPC is shown in Fig. 3 and Fig. 4. Fig. 5 & 6 depicts step response and control effort of the closed loop system with MPC parameters obtained in POS using MOGA. Fig. 7 shows the singular value plot of S(jω) and T(jω) for MPC parameters obtained in POS using MOGA.

In this chapter, 1-norm, 2-norm and ∞-norm have been considered for the estimation of the optimal values of the model predictive controller parameters. Level Diagrams for the objective function is shown in Fig. 8, Fig. 10 & Fig. 12 for MOGA tuned MPC using 1-Norm, 2-Norm & ∞-Norm respectively. Level Diagrams for the controller parameters is shown in Fig. 9, Fig. 11 & Fig. 13 for MOGA tuned MPC using 1-Norm, 2-Norm

& ∞-Norm respectively. The best design parameters are chosen by selecting the point with a minimum value of the Y- axis parameter (which is shown by the green square on the level diagrams). As the best MPC parameters obtained using different struct of LD gave the same model predictive controller parameters. Fig. 14 and Fig. 15 show the step response and control effort of the close loop system with the best MPC parameters obtained using LD technique. Fig. 16 shows the singular value plots of $||S(j\omega)||$ and $||T(j\omega)||$ obtained using best MPC parameters form POS using MOGA.

Figure 3: Pareto front obtained using MOGA tuned MPC.
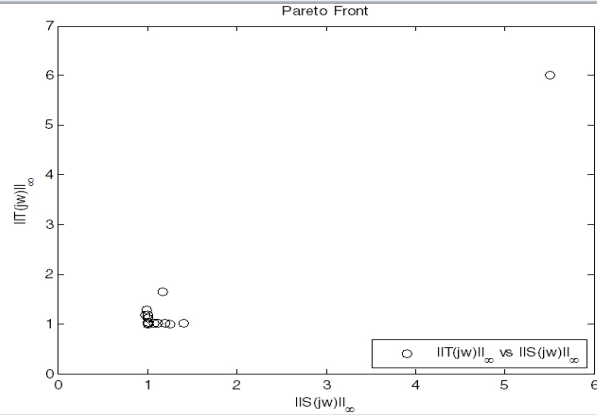
Figure 4: Controller parameters obtained using MOGA tuned MPC.
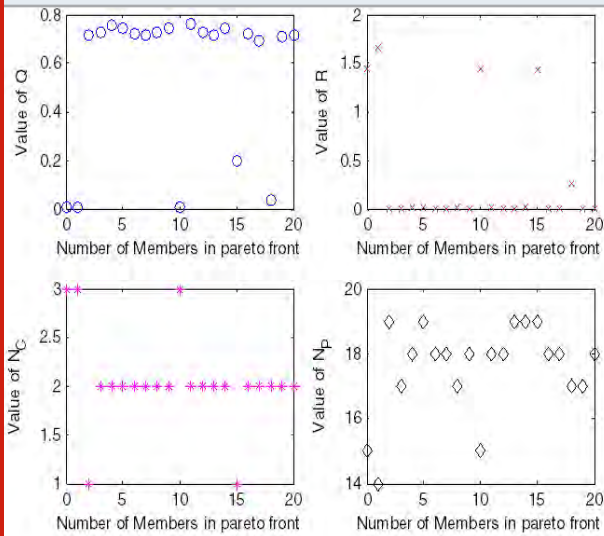
Figure 6: Control Effort of close loop system with all MPC parameter obtained in POS using MOGA.

Figure 5: Step response of close loop system with MPC parameter obtained in POS using MOGA
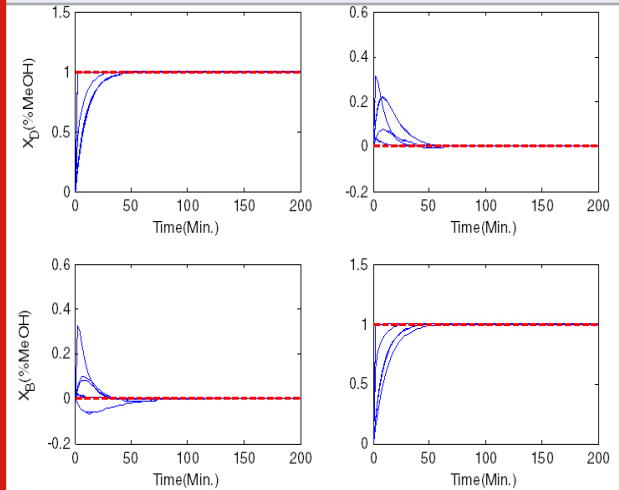
Figure 7: Singular value plot of the $S(j\omega)$ and $T(j\omega)$ for all the MPC parameter obtained in POS using MOGA.
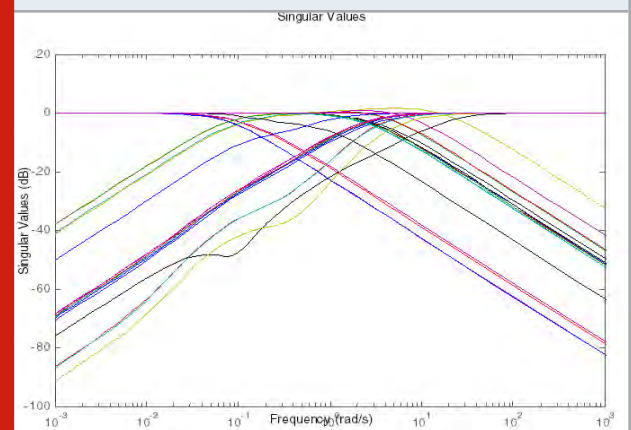
Figure 8: Design objectives obtained for MOGA tuned MPC using the 1-Norm of LD.

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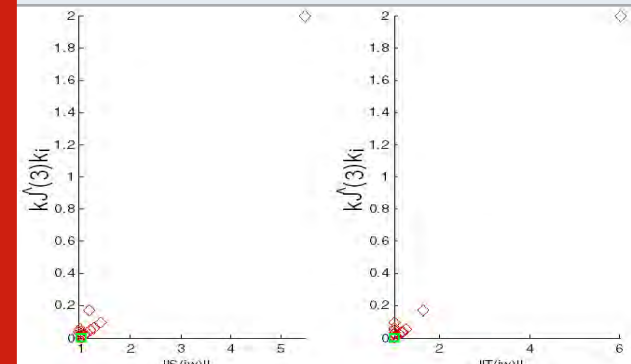
Figure 9: Controller parameters obtained for MOGA tuned MPC using 1-norm of LD.

Figure 12: Design objectives obtained for MOGA tuned MPC using the ∞-Norm of LD.

Figure 10: Design objectives obtained for MOGA tuned MPC using the 2-Norm of LD.
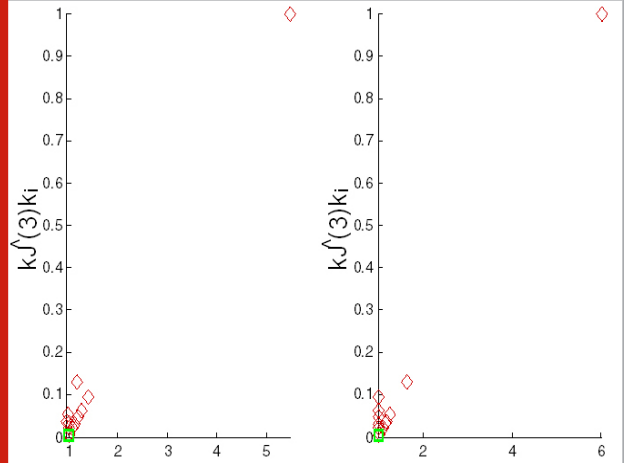
Figure 13: Controller parameters obtained for MOGA tuned MPC using ∞-norm of LD.

Figure 11: Controller parameters obtained for MOGA tuned MPC using 2-norm of LD.
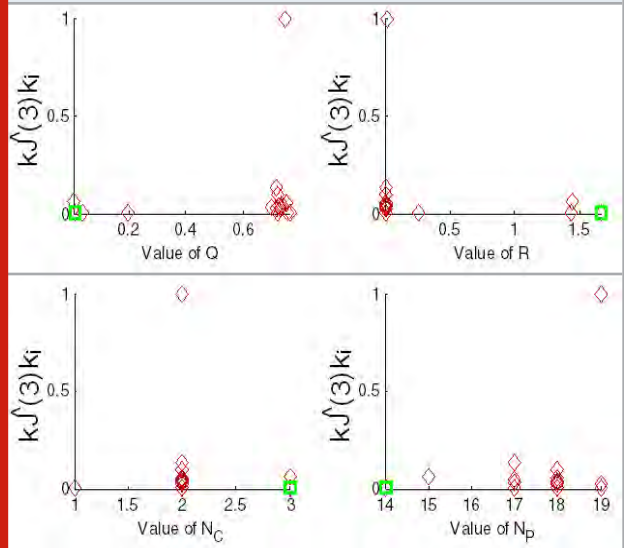
Figure 14: Step response of close loop system with best controller parameter obtained using MOGA.
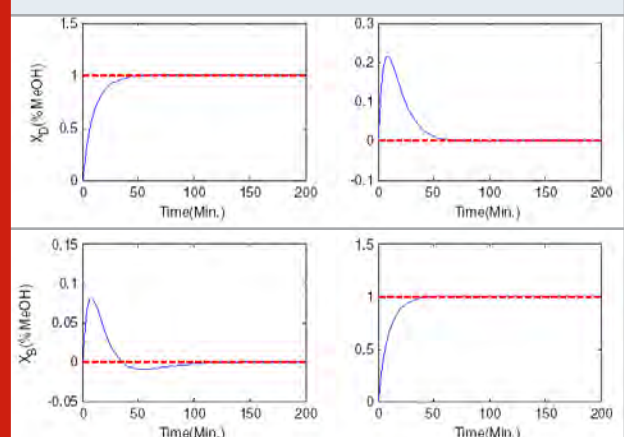
Figure 15: Control Effort of close loop system with best controller parameter obtained using MOGA.
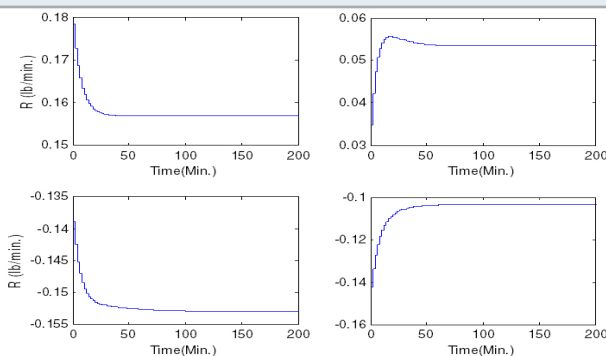
Figure 16: Singular value plot of the S(jω) and T(jω) for best controller parameter obtained in POS using MOGA.
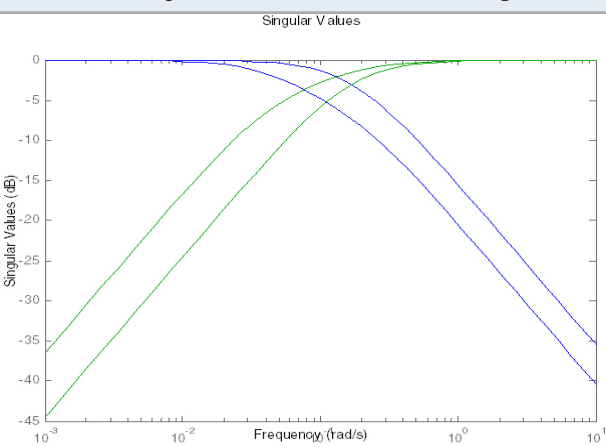
Simulation Results: Paper delineates the optimum tuning of MPC parameters using MOGA for robust wood and berry system. Fig. 14 and Fig. 15 depict best step response and control effort of the system with MOGA tuned MPC. Table 4 states all the solution obtained from MOGA tuned MPC for wood and berry distillation column is robust in nature and give better transient response in terms of overshoot in comparison to other researcher. Figure 3 and 4 shows the pareto set and pareto front obtained using level diagram analysis, where 1, 2 & ∞-norm of the controller parameters and objective functions are used to get the optimum solution from the set of solution obtained using MOGA tuned MPC for wood and berry distillation column.

CONCLUSION

Almost all the engineering problem are multi-objectives in nature. In the real world applications noise and disturbances make the system strenuous to achieve the required design requirements. So it is required to make sure that the system is robust in nature. This paper explores the optimal tuning of the MPC parameters using MOGA to make wood and berry distillation

column robust as well as it satisfy the desired tracking performances. Here the optimization problem is formulated as minimization of maximum singular value of ||S(jω)|| and maximum singular value of ||T(jω)|| for achieving the desired robustness and tracking performances of the top and bottom composition of wood and berry distillation column. From the results obtained in this paper, wood and berry distillation column offers robustness with proper tracking and better transient response in comparison to existing work on the same system. This makes sure the product quality and safety of the process.

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Description of Nature in Bana's Kadambari

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ABSTRACT

Bana's Kadambari is a fantastic fairytale where the great storyteller Bana creates vibrant characters. He is the writer who reveals his own mind through his characters. He expresses his opinions and convictions through them which is not common among all the Sanskrit writers. He had an amazingly modern, humane, and sensitive mind especially which is special for the seventh century India in which he lived. Like modern writers he uses the dramatic techniques of irony, his characters use the words whose real significance is not observed by the speaker themselves. Kadambari as known to all of us is a romantic thriller played out in the magical regions between this world and the other in which the divine and the earthly blend in idyllic splendor. But Kadambari is not just that. There are multiple aspects in which Kadambari can be studied. It has a wonderful description of Nature, flora, and fauna of that era. Leaving apart the storyline in Kadambari, this article mainly focuses on description of nature in Bana's Kadambari. Bana has a great skill in describing the natural phenomena like sunrise and sunset, forests and rivers, mountains and oceans etc. This article focuses on the descriptions of Vindhya forest, maharishi Agastya's Ashrama, Pampa Sarovara, Shalmali tree, Ujjayini city, Kailasa foothills, Acchoda Lake, the lonely Shrine of Shulapani and the wonderful land of Hemakuta, finally summarizing and concluding the specialty of Bana's style of writing and his unique way of describing nature.

KEY WORDS: KADAMBARI, FOCUSES, SHRINE OF SHULAPANI.

INTRODUCTION

Subandhu, Bana and Dandi are the three important classical prose writers in classical Sanskrit. All the three have written almost the same kind of prose which are ornate and complicated in different degrees. Banabhatta has written Kadambari and Harshacharita. Banabhatta passed away before completing his work Kadambari. His son Bhushanabhatta completed the Utttarardha of it. He compares himself to a farmer's son who merely gathers fruits of his father's work. Bana's Kadambari is near

perfect from all the aspects and it has no comparison. There is a famous saying.

Kaadambari rasaagnyanam aaharopi na rochate: It explains the effect of reading Bana's Kadambari. People do not enjoy any food while they are involved in reading Bana's Kadambari. The word Kadambari has two meanings. One, an alcoholic beverage and the other the piece of literary work written by Bana. This is the specialty of Bana. Throughout his work Bana has used the unique literary style of pun. Sanskrit words usually have more than one meaning which makes it highly suitable for this unique literary style of pun. King Shudraka received the parrot named "Vaishampayana" as a gift from a Chandala Women. That bird raised its right leg in salute and recited a verse in the praise of him. The bird could speak so well with pure, distinct, and grammatically chaste turns of phrases so elegantly put together.

It conducted itself like a refined human being with the knowledge of court etiquette. Surprised by this, the king

wanted to know where and how the parrot Vaishampayana was born, details regarding its parents, how it got the name and how it acquired Vedic knowledge, and how chandalas put it in the cage and ended up in his palace. The parrot Vaishampayana replied that it is long story and explains it.

Objective: They main objective of this article is to describe the description of nature in Bana's Kadambari. Bana has beautifully described the special species of flora and fauna in Vindhya forest, Agastyashrama, foothills of Kailasa, Acchoda lake and many other regions around in his special work Kadambari. Description is so marvelous that when people start reading Bana's Kadambari, they even forget about food and hunger.

Description of Vindhya forest: Bana in his Kadambari has used his picturesque unique style and through Vaishampayana described the timberland of Vindhya, Sage Agastya's hermitage, Shalmali or Silk cotton tree, description of forest by Shabara army, the lake Pampa and so on. Bana describes Vindhya forest as the girdle of the earth. He describes that trees in the forest would have grown tall mainly because of the streaming rut fluid of the wild Elephants which roam around in the forest. He describes the forests with its khadgas, the restless rhinos and the Rakta Chandana trees is like Katyayani, the sandalwood paste smeared goddess wielding her sword or khadga. (Banabhatta:107, 1982g) Vaishampayana mentions that the forest with rikshas, the bears and deers mimics the moon and the moon too carries the mark of the deer and the rikshas, the stars surrounded by it. (Banabhatta:107, 1982f).

The author compares forest with the Lanka of Ravana. He explains that, similar to the tall shala trees teaming with monkeys in Lanka, Vindhya parvata also has the long shala trees, tall mansions over run by the monkeys of Rama' s army. Sanskrit language has many words which has more than one meaning which makes it highly suitable for pun. In the above examples comparisons are made on the strength of certain keywords with more than one meaning. For example, the word "khadgas" means 'rhinoceros' as well as 'sword'. Similarly, "riksha" means bear as well as star and "shala" is the name of a tree as well as means 'mansion'.

The author describes that, the forest appears delirious with the palm trees or the "tala" the sound of rustling violent wind "vayuvega" which appears like wild sorrow filled hand clapping or "tala" of a widow filled with grief and wild behavior losing control of her feelings, vayuvega (unmada vega). In other place it seems to be in mourning, where Palm trees have lost all their fronds, the talapatras in the strong wind vayuvega, seems like widow shorn of her ear ornaments, the talapatras. (Banabhatta: 109, 1982e). Here Bana has compared the palm trees which has lost its leaves due to rustling wind, with sorrow filled wild hand clapping of a widow who has lost control of her feelings due to her intolerable sorrow and shorn off her ear rings.

Description of Agastyashrama: Sage Agastya lived in the Dandaka forest on these Vindhya ranges and his hermitage was famed as "the birthplace of dharma" throughout the world. Sage Agastya once drank up the waters of all the oceans based on Indra's request. He is the only one who could control the erring Vindhya Mountain which was spreading across the sky obstructing the movement of Sun's Chariot. Agastya was so powerful that, he digested the demon Vatapi by the fire in his stomach. The author gives a wonderful description of the Sage Agastya's hermitage. He explains that, Agastya's hermitage was beautiful with trees planted and nurtured by his wife Lopamudra, as her own children. All round the edges of hermitage their used to be dark and shady parrot green plantain groves.

The river Godavari would round the hermitage in a thin single stream. The author compares the river Godavari to a widow in mourning (with all her hair woven into a single plait) with an intent only on reaching her dead husband to the ocean whose waters have already been swallowed by the sage Agastya.(Banabhatta:113, 1982a) The author describes that, long time ago Rama lived happily with his wife Sita in the hut put up by Lakshmana in a place called Panchavati to serve the sage Agastya. He describes that Panchavati now remains deserted. Even though ascetics of the ancient times have gone away, the rows of white pigeons sitting quietly amidst dark branches creates an illusion that the trees are columns of smoke coming up from sacrificial altars.(Banabhatta:113, 1982a) He compares the glossy red young leaves of the creeper with soft red palms of Sita while she was gathering flowers for the rituals.(Banabhatta:114, 1982a) He wonders if the blood of rakshasas killed by Rama since soaked deep in the roots have even now stained the fresh grown leaves.(Banabhatta:114, 1982a).

Like this Bana has given wonderful examples to describe Agastyashrama. If we look at the above given examples in two of the examples Bana has compared palm tree without leaves to a widow with no ear ornament and again Godavari river which is flowing around the Agastyashrama to widow's circularly tied hairdo. The question which comes to our mind is why he considered widow for describing these. This also gives us a hint of social and cultural state of widows during that period.

Description of Pampa Sarovara: The author describes that, near Agastya's hermitage there is an astonishingly long Lake called Pampa. Prajapati and Varuna were angry with the Sage Agastya for drinking away all the waters of the ocean, for which Prajapati and Varuna were the overlord. Hence they created Pampa Sarovara. The author questions if they created this ocean like huge lake because of anger on Sage Agastya, that too very close to the hermitage, just to taunt him?.

He comments that the Pampa Lake is never placid, but because of Shabara women who bounce their well-rounded breasts while plunging into the lake it gets disturbed. The countless creatures and myriad diving birds agitate the waters and the sound of the ripples

is heard constantly and the windy rain tosses up the waves and creates cold spays. Blue and white lilies and lotuses grow in the lake as forest. The author describes that blooming lotuses covered with the droplets of honey resembles the eyes in the peacock feathers. (Banabhatta: 117, 1982d).

The humming bees shadows the blooming lotuses. Female Swans turn coquettish and make merry by drinking the nectar in the lotuses. Watersport loving nymphs descend in the lake for bathing. Flowers in the trees add their fragrance to water. We can hear the sound of ascetics filling water to their Kamandalus. White Swans swim in the midst of recently opened white lilies whose sound could be inferred only through their cackle. Pollen dust of Ketaki flowers cover the sandy shores of the lake towards the edges of the beach. The author further describes the hermits standing and doing penance in water, soft fresh grass around the water which remains moist by the water sprayed by leaping fishes and wings of the water birds, the peacocks dancing in their bowers, flowering bushes which fill the air with their fragrance as though goddess of nature is scenting the air with her own breaths, forest elephants come ceaselessly to drink the water from Pampa as though masses of clouds come down to drink water from the lake in the illusion that it is ocean. He finally mentions that beauty of the pampa lake is unfathomable, seemingly unbounded and certainly incomparable.

Description of Shalmali tree: Bana describes a huge ancient Shalmali tree or Silk Cotton tree (Bombax Ceiba) on the western shores of Pampa lake close to the rows of grayish white palms which Rama had pierced through with a single charging arrow. That Shalmali tree had a great old python wound to its roots permanently as it if it was a bank to hold the water permanently. The tree had high branches spread far and wide in the sky as if seeking to measure the extent of horizon. The Author has compared it with the Shiva's flying hair when he performs his cosmic dance with his thousand hands all stretched out. He describes that the tall tree was merely clinging to the shoulders of Vayu with its outstretched branches in the fear of losing balance, the creepers twined like old age tendons, thorns like old age spots, the rain clouds wetted the new green leaves, but the clouds had never seen the top of the tree as it was tall and peek reached Indra's fabled garden. Its top branches were filled with bunches of silk cotton, which looked like foam collected in the mouths of sun's horses exhausted by the trek pulling their lords chariots.(Banabhatta:123, 1982c).

The Shalmali tree stood proudly on the banks of Pampa as a friend of Vindhyas, lord of Dhandaka forests and a prince among trees. There were countless nests in the edges and junctions of the branches, inside the hollows of ancient bark and amidst the foliage. Innumerous families of parrots and other birds coming from different regions stayed here securely with freedom from all the fear of danger because of its great height from the ground. While the birds stayed in their own nests during the night

as soon as the sun shines, they started flying away in various formations in search of food forming dark streaks across the sky as though Balarama had scarred up the dark waters of many streamed Yamuna with the tip of his ploughshare. Like how the blooming dark lilies in Ganga were plucked and cast down by Indra's Elephant, flying birds would look like moving emerald floor with series of mass patches in the sky lake.

The birds would fly back to their nests in this Shalmali tree in the evening to feed the young ones left behind. Brimming with overwhelming love they would take the young ones protectively under their wings and spend the three yamas of the night. It was in the old hollow of this Shalmali tree the parrot Vyshampayana, who is telling his birth story to King Shudraka was born.

Description of Ujjayini City in the kingdom of Avanti: The author describes that the City named Ujjayini had a surpassing beauty and was more splendid than the city of the gods and was like an ornament to all the three worlds. Lord Mahadeva is the presiding deity of Ujjayini. He created this city as yet another earth for his very special abode. Hence the oceans surrounded the city in the form of a deep moat believing it to be the second earth. The whitewashed ramparts that ring Ujjayini looked like Mount Kailasa. The Market streets of Ujjayini were wealth of merchandise-counches, pearls, emeralds and corals. Fine sand looked like gold dust everywhere. There were many art galleries in the city decorated with paintings of devas, asuras, siddhas, Gandharvas and Vidhyadharas.

The author questions if these were really picture gallaries or they were aerial vehicles which had come down from divinities to watch the lovely women gathered at the never ceasing festivities of the city. Magnificent temples in the city Squares looked like Mandara ranges splashed with the milk of the milky oceans while being churned. The golden dooms and the white flying flags looked like the streams of the celestial Ganga. The city had shady green woods with the wells with whitewashed platforms to water the trees. Flying pollens from the Ketaki bushes made the country side appear dusty. The worship of Kama, the god of love goes on in this city as one hears auspicious ringing of the bells. Every house hoisted a flag with fish emblem, the love god's flag with a pole made of wood of the Bakula tree. The innumerable fountains in Ujjayini rumbled like deep sounds of muted Mrudangam.

Water sprays refract the rays of the sun and form rainbows. Peacocks open up their features in an arc and dance in abandon in the rainy atmosphere. There are countless lakes in the city with abundance of lilies, the blue ones in periphery and the white ones in the center so beautiful the one could gaze them forever. River Shipra flows around Ujjayini rising her huge waves possibly in a bid to wash the skies above as though knitting her wave eyebrows in violent jealousy of Ganga seated on the crown of Shiva. The city is the home of men of brilliance and sophistication whose fame is known to

all the three worlds. Even though people are wealthy, they never flaunt their wealth and unbiased in all their dealings and are like living Smritis. They conduct Sabhas where the learned people meet and discuss the affairs of the city. They make gardens, build temples, bridges and water fountains. It was in this remarkable city of Ujjayini, there ruled the king Tarapida who is the father of Vyshampayana, the parrot who tells its previous story to the king Shudraka.

Description of foothills of Kailasa: The king Tarapida's son the king Chandrapida has once came out for the hunt and missed his troop while following the Kinnara pair. He had almost reached the foothills of the Kailasa. Bana describes the magnificent beauty of foothills of Kailasa. The author describes that it was densely wooded with Sarala, Sala and Sallakki trees which were so tall that one had to look up to see their tops which were circular like Umbrella and were of highly medicinal value. Ground was covered with Yellowish Shingles, grass and creepers were sparse due to rocky terrain Red arsenic dust was in the air making everything tawny. The scattered blossoms of the pashanabhangini had made curved tattoo like designs on the rocky surfaces. The rocks had become sticky because of the gums oozing from the gum trees.

Stones had become slippery because of the bitumen leaking from the peak. The chisel hoops of the horses had pounded yellow orpiment which is a mineral consisting of arsenic trisulfide formerly used as dye and artists pigments. There was also gold dust due to gold having been dug out of the ground by rats. Foot hills of Kailasa had pungent Sulphur smell and was dense with cane and Bamboo groves. There were other thick groves of trees to the north east of the Kailasa peak. Cool moist breeze bearing the sweet smell of pollen wafted out of these groves and embraced Chandrapida like shower of Sandalwood water. The distant calls of the swans excited with nectar of lotus attracted Chandrapida to enter the grove in the middle of which was the most beautiful Acchoda lake which he had ever seen.

Description of Acchoda Lake: Bana excellently describes the scenic beauty of Acchoda Lake. He describes that, the lake was like gem mirror of the goddess Lakshmi or the crystal floor chamber of the goddess of the earth. It was as though the skies themselves came down into the pristine waters of this lake. The author questions if the Kailasa had melted or the Himalayas themselves? Or all the white clouds of autumn come together to form the water of this lake? Or could it be the mirror mansion of the god Varuna? Or had the moonlight taken this watery form? Or it must be the clear mind of the ascetics or their chaste qualities of the virtuous that had transformed into water or else how could the water be so pure?.

The water was so transparent that one could see right down to the bottom so clearly that they would get doubt if there was any water or not. It was as though Indra was wielding thousand bows to protect everything around the lake. The lake was very deep and the reflection of tamala forest was clearly visible in water. It was as though the gates of the patala, the nether world was right deep down the lake.

Bana describes that the great Mahadeva himself must have come down from the neighboring Kailasa hundreds of times to bathe in the lake, as he plunged into waters repeatedly, the crescent moon on his head would have oozed nectar competing with the lustre that flowed from the water washed cheeks of Parvathi and the left side of Mahadeva and mixed with the waters of the lake. Brahma might have filled his Kamandalus by the water of this lake and hence purified the water in the process. The Balakilyas would come in group to this lake to perform their, morning, noon and afternoon worship. Many times the seven sages have bathed here which has sanctified the water, as did the women of the siddha clad in the bark of the Parijata tree.

At the sight of this beautiful lake, Chandrapida's tiredness went away and he thought his failure to capture the horse faced Kinnara pair is compensated by the sight of this beautiful lake and his eyes attained their highest reward in their quest for beauty as he has seen ultimate manifestation of beauty. Brahma seems to have created amrita again after creating this late. Umapati will not leave Kailasa mainly because of the splendor of this lake and it is surprising that Lord Vishnu still seek to satisfy his craving for water by lying in the middle of the salty ocean disregarding this lake. The author finally describes that water delights all the senses like Amrita, it gladden the eye by its clarity, coolness comforts the sense of touch, the fragrance of lotuses gratifies the sense of smell, the sweetness of the waters satisfies the sense of taste, the calling of swans thrills the ears and thus this place satisfies all the sense organs.

Description of the lonely Shrine of Shulapani: After enjoying the breeze of Acchoda lake Chandrapida rode towards the western side of the lake that shone with a sort of white lusture like rays of the moon. The place was suitably named Chandraprabha. On the western shores of the lake he saw a lonely Shrine of Shulapani. It was a 'siddhayatna', a shrine where one could attain the fulfilment of one's desire through penance. The spot was surrounded on all the sides with greenery. The charmingly melodious call of Harita bird resonated everywhere. Cuckoos lived there happily by eating tender shoots of mango tree as much as needed Honey bees buzzed around the opening buds of the mango trees. Bhringaraja birds were crushing the full grown hardened buds with their claws.

Chakora birds pecked at the fresh pepper with the tip of their beaks. The Chataka birds drenched in the yellow pollen dust of the Champaka were pecking fruits of the pippala trees. The sparrows had hatched their young ones in their nests built on pomegranate bushes. The beating of wings of the young pigeons were creating a shower of flowers. The sarikas smeared with pollen dust were on the top of the trees. The ground was full of fruit bits minced by beaks and claws of thousands of parrots. The plantain leaves waved gently in air, the coconut trees

were bent as they were laden with coconuts. There were arecanut trees with slender fronds and many Karpura and agaru trees. As soon as Chandrapida entered the shrine, wind blew and he was completely covered with pollen dust of Ketaki as though someone smeared Vibuthi on him before letting him enter the presence of Mahadeva. Inside he saw the four faced idol of Triambaka, the lord of all creation worshipped in all the three worlds fashioned out of white marble. It was where he saw a strangely beautiful women Mahashveta sitting in the yogic posture towards the southern side of the idol.

Description of palace of Gandharva King on Hemakuta:
Chandrapida moves through Hemakuta parvata along with Mahashveta to meet Kadambari as per Mahashveta's request. The author takes this opportunity to describe the beauty of Hemakuta, especially the palace of Ghandarva king where Kadambari lived. While walking towards Kadambari's apartment Chandrapida observes gardens on both the sides of the path. He describes that the path was sandy due to the pollen dust falling from the blooms in the garden. Koels would peck the mango fruits which seemed like mango juice rain on the path. The path is compared to an island of gold with the blooms of the champak flowers on the path. Bees hovering over the flowers made the path appear like dense forest of dark Ashoka trees.

CONCLUSION

Description of Vindhya forest, Agastyashrama, Shalmali tree, Pampa Sarovara, Acchoda lake, city of Ujjayini, and the lonely Shrine of Shulapani are just samples of description of nature in Bana's Kadambari. Like this we can find various descriptions of nature throughout Kadambari in multiple circumstances. We can get a good glimpse of rich flora and fauna of that era. Many of those species are rarely found or almost extinct these days. Blue Jambu fruit juice, pomegranate juice, myrobalans (Amratakri phala), tender leaves of Tamala trees, Ketaki and Karira plants, Kesara trees, arecanut trees, betel leaf creepers, cardamom creepers, Bilva and asvatha trees, Durva grasss, Shala trees, chira and Kusha grass, fibrous roots, Kusha grass, parrot green plantain trees, lotus like Kumuda, Kuvalaya , Kalhara, Saugandhika, tala trees, Shalmali trees, Kalpavruksha, Karpura and agaru trees,

Kutaja,, Knda and Sinduvara flowers are examples of rich flora and founa of that era. Most of the plants and trees described above were highly of medicinal values. It shows the richness in flora and fauna during that era. Bana's special literary style of Pun makes Kadambari even more interesting. The examples used by Bana in comparison of nature are so interesting that there is no other reason for not to accept "Kaadambari rasaagnyanam aaharopi na rochate".

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DIC: Dataset on Indian Cows for Animal Classification and Detection

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ABSTRACT

In this article we present a new dataset on Indian Cows. As per our knowledge, No such dataset is available for general use. The primary motivation for this work is to enable development of novel artificial intelligence algorithms to solve some of the important research problems for Indian animals, such as cows. We present the dataset of 815 images of cows of Indian breed. The dataset is built by collecting images which are freely available over the internet. We hope this dataset will help researchers to build novel deep learning algorithms such as detecting and classifying Indian cows.

KEY WORDS: INDIAN COWS, FARM ANIMALS, DATASET, CLASSIFICATION, OBJECT DETECTION.

INTRODUCTION

In recent years Convolutional Neural Networks (CNN) have become the state of art in image classification and object detection [13]. In this particular approach the training of neural network is done on a large dataset of images to solve several different research problems such as object detection and classification [2]. The dataset has an important role to develop the CNN model for object classification. It is used to feed the information about the specific object into the model. With this process the model can predict the category of the object. The data is generally divided into different groups called classes.

The process of feeding information about the objects into the model is called training the model. Training a model on such large datasets makes it capable to identify different patterns present in the images and learn different categories of objects. In general, there are three major categories of datasets, Image Datasets [14], Audio Dataset [7] and Natural Language Processing dataset [18]. For training a CNN model for object classification, we need image dataset in which large number of images are collected for different object categories. These images are grouped together as per respective classes; i.e. particular class have the images of objects belonging to only that particular class.

There are datasets available today for object detection and classification like, MNIST, CIFAR-10, CIFAR-100, PASCAL VOC, ImageNet, MS COCO, etc. For animal classification there are several datasets available with different animal classes including wild and farm sector animals. For the farm sector animals like cow, there are various datasets available, however, these datasets primarily have images of foreign cow breeds. These datasets, in general, are not much helpful for analyzing Indian cows. One may train

a model to identify Indian cows using these datasets, however, the accuracy of such model will be very poor as Indian cows are quite different in physical appearance as per Fig 1. So the primary motivation for preparing a dataset of Indian cows is to have a dataset which can enable training of CNN models to detect Indian cows with good accuracy. With this dataset researchers will be able to develop novel techniques using CNNs for the analysis of Indian cows. The overall article has arranged as follows. In next section we review relevant literature, in Section 3 we provide details of proposed dataset and finally, in Section 4 we conclude the article.

Related Work: In this topic we review recent literatures of object detection and classification using typical deep learning datasets. CNN models are trained on large collection of image datasets. The model is required to learn meaningful features from these training images. Once the model is trained it can make a use of these features to recognize objects in the given image and can also perform several additional tasks such as object segmentation. MNIST [11], PASCAL VOC [14], ImageNet, MS COCO are some of the standard image datasets which are freely available to use. MNIST is the dataset of 70,000 handwritten digits from 0-9 forming 10 classes. The training and testing set of this dataset has 60,000 and 10,000 images respectively. These images have been used for developing handwritten character recognition [3].

In the year 2012, the PASCAL VOC dataset was proposed with total 11,530 images included with 27,450 objects annotation and total 6,929 objects are segmented. This dataset comprises 20 classes of different objects, like person, bird, cat, cow etc [10]. In ImageNet dataset objects are categorized as per the WordNet hierarchy. Each term in WordNet is specified by many words or phrases, called as synset. ImageNet combines 21,841 synsets of WordNet. The ImageNet dataset built using of 14,197,122 annotated images structured by the semantic hierarchical structure of WordNet [16]. The MS COCO dataset has 91 common object classes. 5,000 plus objects are labeled in 82 classes out of 91 classes, as a whole the dataset comprises 2,500,000 labeled objects from 328,000 images [19].

In the previous years, some work has been done on wild animal classification using CNN [15, 4]. Along with wild animal classification, the deep learning techniques have also been applied on farm sector animals like cow on re-identification problem [12]. The datasets like PASCAL VOC, ImageNet, MS COCO, etc. have multiple classes of animals including class for cow which has multiple images of the cow breed. In Fig. 2 we show sample cow images from these datasets. One may note that these animals are significantly different than Indian cows in physical appearance.

Most of the images in these datasets for this particular class are of the foreign breeds which are not suitable for analyzing Indian cows. The trained model using these datasets will have poor accuracy for classifying Indian cows as both Indian and foreign cows are different in

physical shape and size. Hence in this article we introduce novel dataset which consists of cows from only Indian breed, which will help improve the accuracy of CNN models to detect and classify Indian Cows.

Figure 1: The figure above shows cows from different breeds in India and foreign regions. The left image of the figure we show cows from different breeds found in other countries. The right part we show cows from different breeds from India. From this figure one can notice that Indian cows are significantly different in physical appearance than cows from foreign breed.

Figure 2: Figure above show few sample images corresponding to class cow from PASCAL VOC dataset. It should be noted that cows from India breeds are not present in many of the popular image datasets such as this one.

Figure 3: We show sample images found over the internet for preparing the dataset. The images appear in different shape, size and resolution which requires further processing.

Proposed Dataset: In this part of the article we provide details of the proposed dataset. In order to prepare our dataset on Indian cows, we resorted to the Internet as our primary source for data collection. We collected several images from the Internet. In general, these images vary in resolution and external body pattern (shape and size)

of the animal shown in the image. We show in Fig. 3 typical raw images collected from the internet. We crop the images when there are other objects present in the image so that the primary animal in the image is the cow. We further resize all the images to 600x600 pixel resolution. The final version of the dataset contains 815 images of Indian cows and calves. Our dataset contains total of 1,114 animals annotated in 815 images. We show in Fig. 4 some of the processed images showing diversity in the proposed dataset.

Figure 4: We show few sample images from our dataset after processing. We crop these images and resize them to 600x600 pixel resolution.

Figure 5: Figure above shows sample images of cows and calves with different colors.
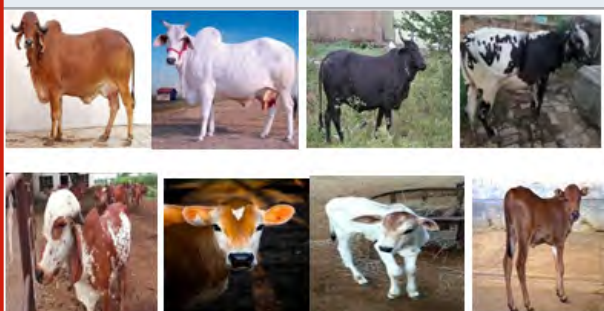
While preparing the dataset we make sure that our dataset has animal diversity. The animals in the dataset have different physical characteristics which makes this dataset truly versatile. In the present work following cow breeds have used to make the dataset: Gir, Red Sindhi, Rathi, Tharparkar, Hariana, Kankrej, Red Kandhari, Nimari, Malvi, Khillari cattle, Amritmahal, Hallikar, Kangayam, Baraguru, Kenkatha, Bachaur, Siri, Kherigarh. The cows in the dataset have different colors like, some cows have single color on complete body like, white, black, brown, red, some cows have different color patches like chocolate-brown, white with dark red, while some animals are pale red, reddish dun, grey-white, dark-grey in color, some of them are having different color marking like, brown color with red marking, black color with white marking etc.

Fig. 5 shows these color differences. Further, the animals also have different sizes and shapes of the horns such as backward curving, lyre shaped, some are peculiarly curved which gives appearance to the horn like half-

moon. Fig. 6 shows sample images of cows having different types of horns. The position of the animals in the images are different like front facing, side facing, few images have only the face of the animal and while few have full animal visible in the image. The bifurcation is given in the Table 1. The sample images of animals' position are shown in Fig. 7 and Fig. 8. We use the format of PASCAL VOC dataset for annotation while preparing this dataset. The format of PASCAL VOC utilizes XML file of each image to store the information of all the object annotated in the image. In Fig 9 we show typical XML code generated from image.

Figure 6: Above Sample images show cows with different shapes and sizes of horns.
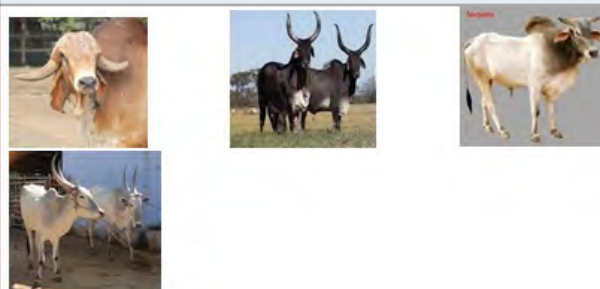
Table 1. Table shows animals' Position bifurcation in the dataset.

Animals' position bifurcation in the dataset					
Animal	Only face	Front facing	Side facing	Full body	Total
Cow	184	138	253	217	792
Calf	68	73	83	98	322
					1114

Figure 7: Sample images of cows with different positions used in the dataset.
Image (a) - Front facing cow image
Image (b) - Front facing cow image
Image (c) - Side facing cow image
Image (d) - Full body cow image

(a)   (b)   (c)   (d)
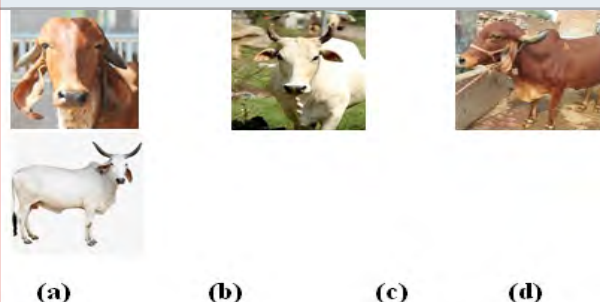
Figure 8: Sample images of calves with different positions used in the dataset.
Image (a) - Front facing calf image
Image (b) - Front facing calf image
Image (c) - Side facing calf image
Image (d) - Full body calf image

(a)   (b)   (c)   (d)
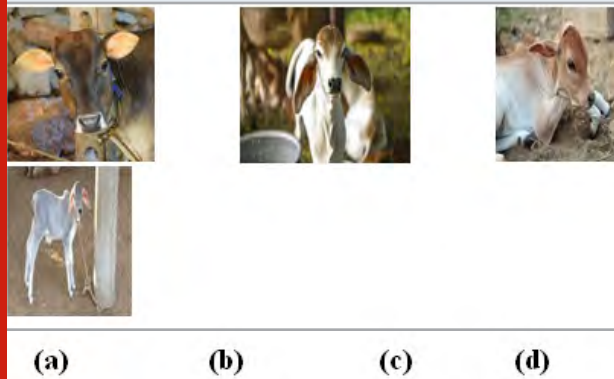
Figure 9: The figure shows typical XML code generated from LableImg tool.

We have used LabelImg tool for annotating an object in the image and generating XML code for images. The LabelImg, graphical image annotation tool, coded in Python which uses a popular C++ framework named Qt for writing GUI applications for graphical interface. It is very simple to use and saves the annotation in XML file of PASCAL VOC format. This tool allows us to draw bounding boxes around objects. The coordinates of bounding box are stored in the corresponding XML file. The XML file also contains information related to image file like, path of the image, class or label for each visual box etc. Fig. 10 shows user interface of LabelImg tool.

General Training Guidelines: In general, training state of the art model in deep learning requires huge amount of training data in the form of large dataset. When number of images available for training are limited the model may overfit the training data and will fail to generalize well on test data. This is a popular problem and studied quite well in the literatures [5]. Since the size of our dataset is not that big in comparison to many popular datasets, a powerful model like VGG [9], InceptionNet [8] and ResNet [6] may overfit the training data. However,

one can mitigate this issue with the help of techniques of transfer learning [17].The model learns how the meaningful features can be extracted from the image by training the model with existing datasets. After the successful training, the model can be fine-tuned on the proposed dataset. This particular approach has been known to avoid overfitting issues and help improve the accuracy for the test data when training dataset size is small. Further, one can increase the effective dataset size using data augmentation techniques which will further improve the model robustness [1].

Figure 10: The figure above show user interface for LabelImg tool.

CONCLUSION AND FUTURE WORK

This article proposes, the novel dataset on Indian cows. We expect that our work will enable the researchers to develop novel deep learning algorithms to analyze Indian cow breeds. The proposed dataset used PASCAL VOC format and contains 815 images with total of 1,114 annotations in total. We have made this dataset freely available for everyone to use. As our dataset is smaller in comparison to many of the existing datasets used for training CNN models, we discussed some of the issues associated with using this dataset such as overfitting. We also discuss recommended practices researchers use when utilizing such smaller datasets for training the models in state of the art deep learning techniques.

In future we will add more images to this dataset to improve the diversity of the dataset which will mitigate some of the issues that we have discussed. Further, there are many cow breeds available in India with each breed being significantly different than the other, for example, Gir, Malvi, Hallikar, Khillari etc, shown in the right part of Fig. 1. In future, we will also provide annotations corresponding to these sub-classes which will allow fine grained analysis of the animal.

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Hygiene and Safety: A Review of the Hotel Industry in the Era of COVID-19 Pandemic

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ABSTRACT

The entire world is affected by the Corona pandemic. Hotel industry is one of the industry which is getting the most affected by this pandemic. It is said that safety comes first therefore, unless the hotel doesn't provide a safe and secure environment to their guest, it will become difficult to get business. As soon as this lockdown ends the hotel industry needs to take up a wide variety of precautions for their guests as well as for their employees. This COVID 19 pandemic has raised the issues related to redesigning of safety measures and hygiene standards. The hotel industry needs to modify the operating systems to reduce the risk of spreading contagious diseases like corona. This study aims to review the initiatives taken by the various hotels during the pandemic and to look into the hospitality industry in a new normal. A total of thirty interviews were conducted with medical professionals and the hotel managers to know their opinion. Based on the study researchers suggested a new preferred techniques and standard for making a safe and secure hotel environment for the guests as well as for the employees. It also, suggested how artificial intelligence can be used in the hotel industry to give more safe and quick service to the customers. Critical analysis was done on the steps taken and new procedures adopted by various hotel groups during the COVID19.

KEY WORDS: SAFETY AND HYGIENE, HOTEL INDUSTRY, COVID19, ARTIFICIAL INTELLIGENCE.

INTRODUCTION

(National Clinical Management protocol COVID-19, 2020) The coronavirus disease (COVID-19) is caused by Corona viruses which spreads illness in animals and humans. This contagious disease is believed to spread from China, Seafood market in Wuhan city in Hubel Province in mid-December, 2019. This outbreak has now been transmitted around 214 countries worldwide. World Health Organization declared it as Covid-19 Pandemic on 11th, March, 2020. (Djeebet, 2020) Corona virus has governed the status of a pandemic which leads to a worldwide crisis and the most hard-hit is the hospitality industry which is much more affected than those of 9/11, SARS, or the financial crises worldwide in the year 2008. Most of the business of the world got constrained but the severest effect is on the Travel and Tourism Industry.

As per OAG Aviation Worldwide, the restrictions imposed on International Flights caused a high loss of around $ 880 billion. (McKinsey & Company, 2020) Hotels adopted a new cleaning process, procedures and touch less or contactless arrangements for the customers which include contactless checkouts via email and hotel Apps. Food and Beverage is being delivered by Robots including pre-packaged meal as well. The consumption of food and beverage is suggested to be consumed in the Guest's

Room itself and avoiding visit to Restaurant or Bar area. The total shutdown of facilities is strictly followed such as Gyms, Spa's, and Laundry facilities.

To provide a safe and hygienic experience to the travelers, tourist and visitors in hotels, many standard procedures and process have been adopted to kick start the business with a New Normal approach and try to stand again. (UNWTO World Tourism Organization, 2020) Against all the challenges the Travel and Tourism sector is facing, this is the toughest throughout the world, UNWTO calls for various support in the form of political and financial recovery measures. Proper coordination is held between international development and donor organization to provide an incentive for Travel and Tourism sector to recover. Tourism support channel is being implemented for wider recovery plans and actions for affected economies. For the upcoming couple of months it would be difficult to get International Tourist. Therefore, the industry is targeting the domestic tourists or local market.

This is a new area of research as it did not exist before 2019 hence, only the latest reviews were available. This paper examined the various steps taken by the hotels, analyzed recently written articles by various authors. Moreover, the current study analyzes the opinions and suggestions of medical and hotel professionals. The next section of the paper presents the initiatives taken by the various hotels during this pandemic and the results of structured interviews are presented. Lastly, research suggests a few recommendations which can be adopted by hotels post COVID19.

Literature review: This section provides the current scenario of the hotel industry during this pandemic and initiatives taken by various hotels and other health organizations:

(Covid 19 updates Oberoi hotels and Resorts, 2020) At Oberoi Hotels& Resorts every step is being taken to maintain cleanness, hygiene and health safety. The standards adopted are completely transparent to ensure that the guests feel safe and confident. The hotel has implemented 360 degree approach in all the aspects of safety and cleanliness standards in all the important vulnerable areas where there is maximum guest close contact points such as Bell desk , Front desk, Cash counter , Boutique ,Security, Housekeeping, Food and Beverage , Laundry, Material Receiving. Every area has a specific standard operating procedure and practices such as at the bell desk and the Doorman, the guest is welcomed by folding hands and greeting "Namaste'' by maintaining physical distance, checking the luggage and sanitizing it with sanitizer, the car gets sanitized by the fogging machine before entering the main porch, Cleaning and sanitizing the Reservation Desk using appropriate chemical in every two hours.

In fitness Centre maximum possibilities for outdoor exercise options has been observed. Tray for guests' personal items is sanitized. The important aspects of housekeeping services is checked and sanitized such as External areas, Main porch, Lobby, Cloak room, Restaurants, Swimming pool, Guest room. After every use the Restaurant tables and chairs is being cleaned and disinfected. At every 30 minutes the guest elevator touch points is being disinfected by the housekeeping staff.Guests are encouraged to view the menu on their own electronic device with the help of the QR code placed on the table. Fresh printed menu is made available on request. The adjacent table is kept vacant without any layout.

In the Kitchen various important procedures is being observed such as in every two hours Cleanliness of production and service areas with Suma Multi D2.3L and sanitizing them with Suma San D10.1 solution. The team members use hair covering nets and hand gloves .Every team member has been trained by the representatives from FSSAI .The laundry cleanliness and Hygienic practices are thoroughly maintained in the areas such as Laundry Checklist, Marking, Sorting and Washing, Linen and Uniform Room. Material receiving areas such as Purchase and Receiving and all the couriers are well sanitized. Always fresh vegetables, fruits and eggs are used and well sanitized by using 50 ppm chlorine solution.

(Hotel operations standard operating procedure Covid 19 and beyond) The Orchid hotel has made a very effective standard operating procedure to maintain and implement safe environment and hygienic practices for its valued guest and its employees. It has made provisions of all the minute and specific detailing of the steps to be followed in the various areas of the hotel operations such as Guest transportation, Entrance, Reception, Guest Rooms, Restaurants, Pool, Gym and Spa, Business Centre, Meetings and Check out points. Temperature check, hand wash and sanitizing various touch points, wearing of face masks and hand gloves, thorough cleaning of guest room, provision of alternate rooms for the guest and keeping a safe distance between guests in restaurant by keeping the adjacent table without layout is done. Strict adherence to WHO and FSSAI guidelines have been maintained like social distancing ,hygiene and cleanliness measures in the hotel to provide the best environment. The safety, cleanliness procedures has not only provided a safe and clean place to stay but also has boosted the confidence of the valued guest.

(ITC Hotels Responsible Luxury, 2020)ITC group of hotels stated that they are providing training to their associates with hygiene protocol, health and safety measures relevant to the current situation. All hotels of ITC are paying attention to maximum contact points, surfaces, and fixtures by increasing the frequency of cleaning with special sanitizing and disinfecting protocols. (Robots and safety certificates: foreign hotel business adapts to the new reality, 2020) in Tokyo, hotels are going to adopt a new robot staff service to keep the hotel clean and to take care of their guest. They want to create the most safe and pleasant environment for their guests. Therefore, they are using robotics services. They have appointed the

robots for high risk zone areas like lobby for cleaning to minimize the risk of its employees.

A manager of hotel New York Rudy Tauscher said that they will check the body temperature of the visitors and will provide them with sanitizer and stickers stating that they are checked and healthy. Stickers are given every day after checking the temperature of the guest. Further, he mentioned that it is new for both the guests and the hotel staff so they tried to make them understand and adapt with work until the situation changes. (Coronavirus (COVID-19) Update - Extended Cancellation Policy, 2020) Radisson Hotels India disclosed that they are following the guidelines released by the WHO and the Centre for Disease Control Prevention. The facilities like fitness center and pool may be non-operational for few days. Fitness centers and pools are a few major facilities which hotel offers to the guest.

(Scandice, 2020) Stated that importance should be given to the hotel staff and the guest by making the area secure and safe through implementing intense safety health standards of cleaning and strictly maintaining physical distancing among staff members and guests during the delivery of food, beverage, room service, and other products. (Chaturvedi, 2020) An international hotel chain Marriott came up with a project named "we care" in India. More than 200 touch points were identified where the new health and safety standard needs to be implemented to meet the challenges. They started usage of protection shield at the front desk, stopped operating buffet service. Mandatory mobile check-in ,check out, reduced banqueting by 50 % and focusing on to clinically clean from aesthetically clean was implemented. Here, there is a need of adopting hospital-grade disinfectant to make sure cleanliness at the highest standards.

(Pandey,2020)The hotel and restaurant post-COVID-19 would have a new normal and that would be the new trend in hospitality Industry. The standard operating procedure which is applied may not continue in future but definitely will teach a lesson to cope up with the need of the hour and guide the industry to strictly adhere the rules and guidelines of cleanliness, hygiene standards and to get well equipped to face any other pandemic in future. The researcher also provided with guidelines for the operation of kitchen in restaurant and hotel by following three important steps such as to make the staff and vendors free from Covid-19 by regular health check-ups. Secondly, he pointed out the strict course and norms for Food and Beverage Control from receiving, storing, and food preparation at the end and lastly he emphasized on Social Distancing.

(Huang, 2020).The researcher discussed the quarantine process and procedures and managing any suspected individual of Covid- 19 in the hotel. He suggested to work on full proof standard operating procedure and implement it to the staff through training. Lastly, he suggested to follow the various guidelines of the Local government body to deal with pandemic Covid-19. Apart from the secondary data primary data were also collected from medical and hotel professionals through structured Interview to know their opinion regarding hotel industry during COVID 19 and post COVID 19.

Results of interview: This section of the paper discusses various responses of medical profession and Hotel managers through Telephonic Interview. Two different questionnaires were made for interviewing with medical and hotel professionals. The first structured interview was conducted with 15 medicals professionals. Findings from the interview are asfollows: Medical professionals were asked about why to follow clinically clean, Hygiene, and Safety practices for its guests and employees Post Covid-19 Pandemic? Most of the respondents referred that the Cleanliness and hygienic practices should be followed strictly to safeguard their valued guest and the employees from the life-threatening Covid-19 Pandemic. The respondent emphasized that as the hotel deals with a large number of guests, their stay in the hotel it should follow the hygiene and safety procedures to stop cross-contamination as well as the spread of the corona. Safety of guest and employees are on the top priority of any hotel Therefore, there is a strong need of switching to the clinically clean procedure and providing a safe and secure environment to the guest as well as staff.

When it was asked for the suggestions regarding safe environment most of them responded to adhere the guidelines released by the Government bodies, Local Health Authority and various procedures, practices related to Hygiene, Cleanliness, and Safety. The respondents suggested various points such as before entering the hotel the guest's body temperature should be measured and entry should be allowed only with the face masks. Regular sanitization of the high touch point areas such as lobby, Guest common Toilet, and to provide clean air through a system of air filtration. To instruct and train the staff about the various principles of Hygiene and cleanliness practices that needs to be followed regularly and religiously. To immediately take action by informing the Government health and Hospital authority in case of symptoms found of Covid-19.

The second set of structured interview was conducted with 15 managerial level Hotel employees of mostly high rated hotels. The questions were asked regarding the redesigning of the Standard Operation Procedure of hotels which would help to provide a Safe and Healthy environment to its Staff and Guest. The most of the respondent agreed with the redesigning approach and were ready to provide an additional measure of hygiene. Suggestions were given to boost guest's confidence and appreciated the Government Authority's steps laid on the Standard Operating Procedures and emphasized that hotel from their end would implement the safety standards rigorously and by following these steps and procedures , the employees would also be more confident about their wellbeing and health.

Based on the question asked on Micro and Macro changes of the redesigning of the Standard Operating Procedure, the respondents remarked regarding breaking the tasks

into micro task by introducing new disinfectant products and procedures. Also emphasized on the all-round changes in the Standards throughout the guest course such as basic information being provided to the guest at the time of reservation, sanitization of guest's luggage during the welcome along with temperature checks, compulsion of wearing the mask for all the employees as well the guest at most of the time, at various important touch points installation and provision of sanitizer dispensers, cancellation of Banquet functions and events to avoid gathering and creating zero contact environment and place. Also disclosed the possibilities of use of artificial intelligence in the industry. How technology and robots could be used during this pandemic as well as in new normal.

Based on the question asked regarding the increase of confidence level among the staff members and guest by redesigning the Standard Operating Procedure, most of the respondent agreed as well as emphasized that the psychological aspect is the most important and crucial at this time when most of the people in the world are panicked and afraid in the on-going circumstances. The redesigning of the Standard Operating Procedure is welcomed by the guest who makes them feel more confident about the hotel and would thereby feel secure, happy.

Based on the question asked regarding any constraints faced by the hotel management during implementing the Redesigning of Standard Operating procedure, the respondents agreed to adapt to the new normal, during the initial phase of implementing the Standard Operating Procedure there might be fewer constraints but as these are lifesaving procedures, the staff will get habituated by the new normal and there is less or no constraints faced during implementation of the Standard procedures.

Based on the question asked whether the redesigning of the Standard Operating Procedure of the Hotel would bring the lost business in track, most of the respondents agreed with and hoped that the change and redesigning of Standard Operating Procedure in the hotel would boost confidence and trust among guest and employees unless and until the world gets freed from this COVID 19 by the invention of Vaccine.

Findings: Most of the hotels in India are following the guidelines issued by the FASSI and WHO strictly for the entire major areas of the hotel.Hotels have introduced new chemicals to clean and maintain various areas of the hotels .There is ambit of applying artificial intelligence in the hotel industry to provide safer, contactless, and quick service to the customer. Hotels have switched from aesthetically clean to clinically clean procedure. Hotels are training their employees about the principles of safe handling procedures of the various services which are provided to the guest such as food, accommodation. All the high touch points identified by the hotels be cleaned and sanitized properly. Hotels are expecting the industry to bounce back soon and targeting the domestic tourism.

CONCLUSION

It can be concluded that in the COVID19 pandemic standard operating process which are being used by the hotel industry may not remain for the future, however, educate for adaptation with the need of the hour and guides the industry to observe as well as stick to the cleanliness and hygiene requirements for maintaining a safe and secure environment for guests and staff. In a new normal artificial intelligence may replace many task which humans do in the hotel industry. By using the AI hotel industry can provide more safe, contactless, and quick service to the customers. Post-COVID 19 would have a new normal and that might be a new way of hotel industry.

Suggestions: The hotel needs to provide a clinically clean safe environment to the guest as well as its staff to build confidence among the staff and guests. The Standard Operating procedure of hygiene and cleanliness practices must be implemented strictly without any second thought as this will sail the cleanliness norms and practices intact. The new approach needs to be carried out clearly to reassure everyone that the hotel is doing all to maintain a safe and hygienic environment. The staff must be updated with the knowledge and principles of safe handling procedures of the various services, products rendered to the guest such as food and accommodation through proper training, In-room dining services can be given priority over services in restaurant or Banquets. Disinfection tunnel system can be fixed at the entry of the hotel to sanitize the guest before entering in the hotel. Mist spray machines can be used by the hotel to make the area disinfected and for purifying the air.

Artificial intelligence would play a very significant role in coming days within the Hotel industry. AI equipment is regularly making its way into the industry. Holographic ordering for the restaurants in which guests can see the 3D Menu via a mini holographic projector on the table can be used. Holographic can also be used inside the elevator to avoid contact with buttons. It is kind of digital button in the air. Keyless entry might also take place where hotels can use technology like QR code or face recognition machines. Flippy Kitchen the world's first autonomous robotic kitchen which can learn from its surroundings and acquire new skills over time can be used to make food items like burgers and pizza. Sally is the first world's first salad robot which can put together more than 100 types of salads on one press of button and the customer gets his favorite salad. It maintains more hygiene and provides fresh food. Ginger robotic waiter by Nepal, serves food to customers and even crack jokes, such kind of technology can be adopted by hotels all around the world. Talking tech may be used to address queries on the front desk and can be placed in hotel rooms. All the suggestions are the need of the hour to be safe and make the word the safest place to live.

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English Language Teaching in the 21st Century: A Paradigm Shift Towards E-Learning

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ABSTRACT

There is an increasing body of research finding advocating the use of blended learning in the teaching-learning process. On similar lines, scholars have explored the use of this methodology in language teaching as an alternative to the traditional method that was, mainly, based on direct instruction. It is therefore critical to understand what blended learning is and how it can be applied for learning English in the classroom. This paper highlights the possibilities offered by blended learning to language teaching and language acquisition. In this respect, this paper should help teachers in understanding what exactly to expect from blended learning if they use it as their method of instruction in language learning.

KEY WORDS: BLENDED LEARNING, FLIPPED, E-LEARNING.

INTRODUCTION

English is the most widely spoken language across the world in the 21st century. A quarter of the world's population, roughly around 1.75 billion people speak English at a useful level (Howson, 2013). Therefore, it would not be wrong to say that the English language, today, has acquired the status of a 'global language'. It has also emerged as a 'utilitarian' language with software and operating systems being developed in this language. With the greatest literary and non-literary resources being available in the English language, it has also gained the status of a 'library' language.

The ascent of the English language in India has its roots in a quote by Lord Macaulay, who, whilst establishing his aim for introducing English as a medium of instruction in schools, famously stated that it was in fact "to form a class of persons, Indian in blood and colour, but English in taste, in opinions, in morals, and in intellect" (Banerjee, 2016). The aim of the British was to colonise the minds and affect culture through language. For Indians, the language served as 'a window to the world'. Although it occupies the position of associate official language in India, it is widely used for inter-state communication, thereby, becoming a 'link' language (Sharma, 2018). The growth of the English language in India today is reflective of the need of its people to be able to fully participate in national and international life (Amritavalli, 2006).

In the present context, there are many opportunities and some challenges to English Language Teaching (ELT), particularly, motivating students to communicate and express themselves fluently in a language that may not be their mother-tongue. This is known as the mother tongue interference phenomenon, wherein a learner tends to transfer the acquired skills in his native or indigenous language (L1) to his second language (L2). Additionally, second language learners encounter phonetic difficulties while using the English language as they find it difficult to pronounce certain English words whose sounds are absent from their native languages (Rachana, 2017). Consequently, English language pedagogy must focus on the achievement of a basic proficiency such as acquired in native language learning (Amritavalli, 2006).

21st Century has transformed the traditional modes of communication in the wake of science and technological revolution and truly globalised the human learning experience. The increased accessibility to the vast knowledge across the world and the new avenues of information have started indicating an inevitable shift from the traditional teaching learning methods to the new approaches. This shift can be seen partly as a response to the changing teaching-learning environment and partly as a consequence of the globalised world, potentially fading the logic of the North-South divide, at least in the educational field.

Over the last few decades, there has been an incremental use of technology in the classroom. The NPE (1986) had laid special emphasis on the use of computers for improving quality of education (Shivam & Singh, 2015). One of the approaches for technological integration in the classroom is via blended learning. This pedagogical method has gained immense popularity, with different scholars investigating the implementation of this teaching methodology and one of its models, the flipped classroom, in various institutions (Eppard & Rochdi, 2017). Aimed as a preliminary initiative towards understanding the implementation of blended learning in classrooms, this paper presents current ideas, research results, and practices of blended learning to reveal its nature, types, benefits and success factors for implementation. The present paper seeks to propose the emergence of e-learning as a new educational paradigm.

Rabindranath Tagore once stated, "Don't limit a child to your own learning, for he was born in another time." Taking forward this thought, education today, no longer stands by the old "jug and mug theory" of learning, wherein the teacher was the full mug, pouring knowledge into the empty mugs, represented by students. Traditional teaching was teacher centred. The problem with traditional lectures was, mainly, a matter of pacing. For some students, the information presented in class may be known to them; other students may have trouble taking in information so rapidly, or they may lack the prior knowledge needed for understanding the concepts presented (Alsowat, 2016). English language teachers must, therefore, move away from the traditional approach and adopt a more communicative approach.

Aim of the Study: There is an increasing body of research finding advocating the use of blended learning in the teaching-learning process. On similar lines, scholars have explored the use of this methodology in language teaching as an alternative to the traditional method that was, mainly, based on direct instruction. It is therefore critical to understand what blended learning is and how it can be applied for learning English in the classroom. This paper highlights the possibilities offered by blended learning to language teaching and language acquisition. In this respect, this paper should help teachers in understanding what exactly to expect from blended learning if they use it as their method of instruction in language learning.

Research Questions: The main research questions are:
1. What are the definitions of e-learning and the related concepts (mainly blended learning and the flipped classroom)?
2. What is the educational philosophy of blended learning and the flipped classroom?
3. What is the educational framework for implementing e-learning in the English language learning classroom?
4. What changes would blended learning bring to the educational environment and English language learning experience?

Significance of the Paper: Language teachers are in the best position to benefit from this paper as they will manage to understand the best approach or strategies to employ while enhancing the skills of language learners. It can also serve as a guiding tool for planning of blended learning or flipped learning practices to enhance language acquisition.

Research Method: The paper relies on secondary sources and is primarily based on qualitative method of analysis. The paper is based on existing research and literature. In addition, the paper analysed theoretical groundings for the application of these new models of e-learning from previous studies. For this, the descriptive method of research has been employed. The paper proposes e-learning as a new paradigm in the field of education and, specifically, English language learning.

What is Blended Learning?: After realizing the nature of the challenges associated with English language teaching, blended learning has evolved as an alternative for meeting those challenges (Tawil, 2018). Blended learning, which is now a part of the academic vernacular, is essentially based on e-learning. In order to understand the nature of blended learning, it is important to first begin by grasping the meaning of e-learning.

E-learning has often been associated with various terms, such as computer-based learning, technology-aided interaction, and computer-based training. It has been defined in various ways as well. One such definition was given by Horton (2006), who defined e-learning as "the use of information and computer technologies to create learning experiences" (Rice & Gregor, 2016), while according to Abbad et al (2009), "E-learning is any learning that is enabled electronically". For Wentling et al (2000), the term e-learning refers to the attainment and use of knowledge that are predominantly facilitated and distributed by electronic means (Arkorful & Abaidoo, 2014). Koohang & Harman (2005) state that "E-learning is the delivery of education (all activities relevant to instructing, teaching, and learning) through various electronic media" (Koohang, Riley, Smith, & Schreurs, 2011).

Another definition states, "E-learning is the use of technology to deliver learning and training programs" (E-learning portal, 2009). These definitions focus on different aspects of e-learning. Some of these definitions

focus on the use of the web for delivery of educational experiences while others focus on the use of information and communications technology in learning. Despite these differences, all of them indicate that e-learning makes it possible for learners to broaden their knowledge base through the use of computer-aided technologies.

The definition referred to in this paper defines e-learning as a set of practices that uses technology-aided interaction to create, provide and enhance learning (Rice & Gregor, 2016). While e-learning continues to remain popular, it has also faced opposition on a few counts, such as the charge of depriving students of "real" experiences, leading to isolating students, failing to motivate students and resulting in increased dropout rates. To meet these challenges, teachers and universities are working on courses that provide both fully online and face-to-face instruction. Blended learning as an approach was invented with the intention to add to the already existing strengths of e-learning. Thus, it seeks to optimize elements of e-learning rather than replacing them (Parlingdundan, 2013).

Like many advances in educational practice, blended learning is defined and implemented in multiple ways. As more and more educators and institutions use it, many different meanings have evolved. According to Bonk and Graham (2006), "Blended learning systems combine face-to-face instruction with computer-mediated instruction (Parlingdundan, 2013). In line with this, for Stacey and Gerbic, blended learning involves "some combination of virtual and physical environments" (Bryan & Volchenkova, 2016). The Australian National Training Authority (ANTA) (2003) describes blended learning as the integrated combination of traditional learning with web-based online approaches (Shivam & Singh, 2015). Another definition by Welker & Berardino (2006) emphasizes that blended learning is an integration of e-learning tools such as virtual learning environment with face-to-face learning (Aji, 2017).

Thus, it is used to refer to any combination of face-to-face teaching with computer technology (online and offline activities/materials)' (Hockly, 2018). All these definitions reflect that blended learning is a combination of different methods of learning, different learning environments and different learning styles. The "right" blend can offer a richer and "optimal" learning environment. Using a few effective tools shall prove to be an efficient way to achieve a deeper approach to learning, foster autonomy and maximise social interaction in the classroom (King, 2016).

Models of Blended Learning: Staker and Horn (2012) categorized blended learning into four models: rotation, flexible, self-blend and enriched-virtual (see figure below) (Bryan & Volchenkova, 2016). The following section describes each model.

This typology was reduced to four from the original six models. The six original models were the face-to-face driven model, the rotation model, the flex model,

the online lab model, the self-blend model and the enriched virtual model. The face-to-face driven model was eliminated, and the online-lab model and the self-blend model were merged. In the face-to face driven model, the introduction of online instruction is decided on a case-by-case basis, meaning only certain students in a given class will participate in any form of blended learning. In the rotation model, the instructor decides the fixed schedule according to which the students shall rotate between different learning modalities, which may include working online, individual face-to-face interaction, group projects or small group activities. One of the modalities is online learning. The Rotation model includes four sub-models: Station Rotation, Lab Rotation, Flipped Classroom, and Individual Rotation (Parlingdundan, 2013).
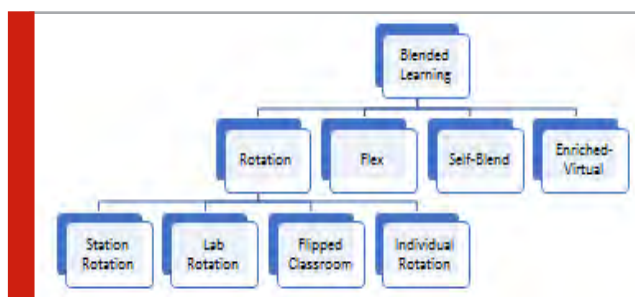
For the flex model, students cover most of the learning material online according to an individually tailored schedule, and the required face-to-face support is provided by the teacher, whilst in the online lab model, students add to their regular coursework by taking an online course on-campus. The self-blend model of blended learning offers students the opportunity to take additional classes, beyond the ones already offered at their school and in the enriched-virtual model, the study is, predominantly, online with occasional visits to the physical learning environment for face-to-face interaction (Bryan & Volchenkova, 2016).

As mentioned, there are different variants of the rotation model. The most interesting variant of the rotation model is the 'flipped classroom'. Flipped instruction is a form of blended learning in the way that it connects face-to-face teaching with online learning. Here, the student studies the preliminary or introductory content online (at a location of their own choosing), and activities, that support meaningful learning, are conducted in the classroom. Thus, the order of the traditional teaching-learning process is reversed (Szparagowski, 2014).

The Flipped Classroom as A Mode of Blended Learning: Flipped Classroom is not a recent concept. It is a mode of blended learning that involves a different process than that employed in a traditional classroom. The researchers often credited with first mentioning this inverted model of learning, Lage, Platt and Treglia, published the paper "Inverting the Classroom: A Gateway to Creating an Inclusive Learning Environment" in 2000. According to them, flipped learning occurs when events that have traditionally taken place inside the classroom, now take

place outside the classroom and vice versa" (Eppard & Rochdi, 2017). The concept of a flipped class, according to Jonathan Bergmann and Aaron Sams is "that which is traditionally done in class is now done at home, and that which is traditionally done as homework is now completed in class" (Bergmann & Sams, Flip your Classroom: Reach every student in class every day, 2012).

The Flipped Learning Network defines it as "a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter" (Piehler, 2014 as cited in (Ouda & Ahmed , 2016)).

Estes et al proposed a 3-stage model of the flipped classroom consisting of preclass, inclass, and postclass learning activities. Preclass activities can include readings, short recorded video or audio lectures, or some other form of computer-based instruction. Preclass work is mainly to introduce the information that needs to be learned. Students should be given information regarding what they are expected to do or know beforehand, rather than simply directing them to read a specific chapter or watch a video. The pre-class work acts as a base for the in-class activities, which may include quizzes given at the beginning of class, group learning activities, problem solving, case discussions, or other active-learning methods that apply to different learning types. Postclass learning activities in flipped classroom formats usually involve learning assessments, in the form of presentations, and further application of skills or knowledge (Rotellar & Cain, 2016).

Flipped learning encourages students to take responsibility of pre-learning at home (Jarvis, Halvorson, Sadeque, & Johnston, 2014). It also permits students to stop a video to take notes or go back and listen again to something that they have not understood. Additionally, it provides support to absentee students to be on par with the rest of the class (Kitano, 2015). Blended learning is a teaching methodology which combines the traditional classroom with on-line activities. It finds its best application in the Flipped classroom. In this pedagogical model, the role of the teacher has changed from knowledge-giver to that of a guide or facilitator as the responsibility of learning has, somehow, transferred to students who have direct access to the contents of the lesson before going to school (Capone, Caterina, & Mazza, 2017).

Theoretical Foundations

Bloom's Taxonomy: Bloom's taxonomy is an instructional framework that is often used to determine the outcomes of teaching and learning. This framework, which is depicted as a pyramid, classifies thinking skills into six hierarchically arranged sections that range from lower-level cognitive skills to higher-order thinking skills. This pyramid was revised in the 1990s. The revised six levels in Bloom's taxonomy are: remembering, understating,

applying, analysing, evaluating and creating (Stanny, 2016). This revised version of Bloom's Taxonomy is relevant to flipped learning as the task of learning can be performed as homework, through a video or any other appropriate resource, thereby, building upon the lower tier of Bloom's Taxonomy, remembering and understanding. During class time, students can be asked to demonstrate their new knowledge and focus on Bloom's higher tier, applying, analysis, evaluation, and creating. Thus, the assimilation of information, which demands complex thinking skills, occurs during class, under the guidance of an instructor or mentor. With the feedback from the instructor or the classmates, as well as viewing and learning from the work of others, the class transforms into a community of learners (Mehring & Leis, 2018).

In the words of Albert Einstein, "Education is not the learning of facts, but the training of the mind to think". In the flipped classroom, students practice remembering and understanding at home, by watching instructional videos, visiting course-related websites, listening to audios or at least reading the lesson. In class, teachers utilise that freed-up time by engaging students in activities that generate critical thinking (Bergmann & Sams, 2013/2014). Higher-order thinking skills train students for real-world application (Conklin, 2012). Language is an instrument for development of abstract thought and knowledge-acquisition. In English language classrooms, language should serve as a means of developing higher-order thinking skills (Burns & Richards, 2012) as higher-order thinking skills increase students' motivation as well as achievement (Brookhart, 2010).

Constructivism: On the basis of our earlier understanding, flipping a classroom implies a reversal of the traditional class wherein transmission of information takes place outside the classroom and assimilation takes place in the classroom (Eppard & Rochdi, 2017). The flipped classroom incorporates the constructivist learning theory as students "construct" their own knowledge (Mehring & Leis, 2018).

The foundation of social constructivist theory is based on Lev Vygotsky's theory of social constructivism. This theory contends that cognitive development of children takes place in the context of socialization. Vygotsky defines the "Zone of Proximal Development" (ZPD) as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem-solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978, p. 86 as cited in (Ozer, 2004)). Thus, the zone of proximal development indicates the difference between what a learner can do without guidance and what he or she can achieve with support and encouragement from a peer.

Accordingly, whenever a student is at the zone of proximal development for a specific task, scaffolding (or providing supporting to the student) will give the student the confidence to accomplish the task. With the

support of the mentor (guide/instructor/teacher/peer), the student will gain the confidence to accomplish the task independently (McLeod, 2012). Essentially, if flipped classrooms include collaborative learning activities and problem-solving tasks, then constructivism can be seen as providing a theoretical underpinning to this mode of blended learning (Jarvis, Halvorson, Sadeque, & Johnston, 2014). Basically, in a Vygotskian classroom, students are exposed to discussions, research collaborations, electronic information resources, and project groups that work on problem analysis (Ozer, 2004). Thus, students learn as a result of social interaction and collaboration with others. Blended learning and the flipped classroom provide multiple opportunities for collaboration and social interaction and hence, prove to be beneficial for language learning.

The Pedagogical Framework Of E-Learning For Elt
The Structure of The Elt Flipped Teaching Classroom
Model: Engaging the learners while teaching is very important as passive learners will not be able to practice all the language skills in the classroom

Hamad Alsowat (2016) has developed an 'EFL Flipped Classroom Teaching Model (EFL-FCTM). This model directs EFL (English as a Foreign Language) instructors to the practical procedures that can be implemented step by step in EFL classrooms. The suggested model (EFL-FCTM) has four phases beginning from outside the classroom activities and ending with assessment. Bergmann and Sams (2012 & 2015) have also provided various useful inputs and relevant guidance for flipping the classroom. McGrath et al. (McGrath, Groessler, Fink, Reidsema, & Kavanagh, 2017) have also compiled a list of seven steps in the 7C Model (Conceptualise, create, communicate, collaborate, consider, combine, consolidate) to demonstrate the stages involved in flipping the classroom. This paper presents different stages that include a combination of the procedures listed in the three mentioned works.

First: It is important to flip one's thinking and open one's mind to the endless possibilities of e-learning. The instructor chooses the lesson to be flipped. The instructor must conceptualise based on the students' access to technology, students' prior experiences, and the institution's technical support system. Also, the instructor has to assess the suitability of the lesson for flipped learning, as all lessons cannot be flipped. The instructor also needs to consider the learning objectives of the lesson. The learning objectives are planned keeping in mind Bloom's Taxonomy and are divided into lower-order thinking skills (LOTS) and higher-order thinking skills (HOTS). LOTS are stated to be achieved outside the classroom and HOTS should be achieved in class.

Second: The instructor creates or designs the learning content. For this, the instructor needs to set aside some time each week to explore the field of e-learning and to consider any technological barriers that may arise. As Bergman and Sams (2015), suggest, the best tool to use "is the one you can actually use". They also mention

that successful flipped classrooms usually make use of videos created by instructors themselves. Next, the instructor delivers the content through videos, audios, reading materials and/or by any means before the next class. For this, the instructor should, ideally, collaborate with e-learning designers, librarians and developers. This content should focus on LOTS. Students watch the videos, reads the materials, listen to the audios and the other materials assigned by the instructor outside the classroom. They focus on remembering the information provided and on understanding the main ideas.

Third: In the classroom, students are busy in developing critical thinking skills through active learning activities, discussions and collaborative learning. These methods encourage students' participation and engagement. The instructor acts as a facilitator and guides the students towards discovery and learning. Here, the instructor frequently communicates with the students to ensure reflection takes place. It is also important to utilise tools or plan activities that will enhance learning outcomes.

Fourth: For the closing activity, students have to do projects, presentations and assignments related to the lesson. The instructor evaluates these activities to ensure that the learning objectives have been achieved. While planning the assessment, the instructor can have various types and methods of evaluation. They can be done online or onsite, depending on the particular learning objectives. In the case of onsite assessment, the teacher may rely on regular tests, exams or performance observations. For online evaluation, the students may complete some assignments that they should submit online (Stein & Graham, 2014).

Fifth: At the end, the instructor evaluates every step of the model to generate a feedback for the whole lesson and depending on that evaluation, plan for the next lesson or unit.

Thus, while planning any of the blended learning models, the instructor needs to plan the content, learning resources, learning activities and assessment. The instructor also needs to provide some time to the students to become familiar with the blended learning platforms. It is important to note that the flipped classroom is adaptable to a teacher's style and circumstances. The teacher can personalize his/her version of flipped learning and play to their individual strengths as educators (Alsowat, 2016). The core idea of constructivism applied to learning is that the focus is on the learners. In this learner-centred environment, knowledge and understanding is socially constructed. From the above steps, we can surmise, that this teaching model adapts to the constructivist learning theory and constructivist learning environment as it is directed towards student-centred learning under the guidance of teachers (Xu & Shi, 2018).

Implementation in English Language Classrooms: It has been said that we cannot really teach language, we can only create conditions in which it will develop spontaneously in mind in its own way (Gomaa, 2010 as

cited in (Adas D. O., 2013)). The advantage of blended learning is that both face-to-face and technology teaching methods support each other and address the limitations of each by merging, so as to achieve the best results in language teaching. The four foundational skills of language learning are speaking, reading, listening and writing. While learning a language, it is necessary to master these skills to ensure proficiency in the use of the language. The relationship between the four language skills can be represented as (Ahumaraeze, 2015):

	Input	Output
Spoken	Listening	Speaking
Written	Reading	Writing

Blended learning enhances these foundational skills, which are all fundamental to increasing comprehension and enhancing the communication process.

Reading is an important skill to master while learning any language. The teacher must prime the students for the lesson. Approaches and methods need not be necessarily exclusive but maybe mutually supportive to develop fundamental competencies. Up to class eight, a teacher may conduct model reading for the first two or three lessons. Teachers can record themselves reading the lesson with correct intonation and pronunciation, and then share this through various platforms, online or on the school system, with the students. This resource can help students practice reading by giving them the opportunity to pause and rewind while listening to difficult words. It can also help develop their listening skills. During the next classroom session, the teacher could ask the students to read aloud in class. This also helps them gain confidence, as it builds when the student is encouraged to read and everyone else is quietly listening. Posing questions through google forms to check their comprehension will also help for further differentiated instruction and in-class activities.

Tech tools such as Curriculet, Actively Learn, StoryBots, Have Fun Teaching and Subtext can also be used for reading activities and for exposing students to different reading material, as these types of web-based programs allow teachers to freely use many works from the public domain. This also provides opportunities for 'Differentiated Learning'. Teachers can also insert, within the text, customizable questions, quizzes and notes to engage the students as they progress through the reading material. These technologies support teachers in customizing which extra material each student receives, personalized to his or her learning requirements (Bergmann & Sams, Flipped Learning for Elementary Instruction, 2015).

Listening: needs more than one instance in hearing because it is not only about hearing but also about understanding and interpreting the meaning of the conversation. Through blended learning, students can be exposed to varied learning aids such as recorded drills, conversation practice and various other media. Students can practice listening to vocabulary, sentence structures and dialogues in the English language (Aji, 2017). Training students to develop their listening skills by exposing them to different songs (age appropriate) would also prove to be a useful exercise. Exposure to well-known speeches could further develop their language proficiency and help them to structure their thoughts meaningfully.

The main aim of language learning is to be equipped with the target language skills that the learner can successfully apply in real-life situations (Aborisade, 2013). Public speaking is an effective way of sharing ideas and it is best cultivated in the face-to-face interaction in the classroom, as online learning exclusively does not harness this skill effectively. Regular practice is fundamental in all language learning and it is vital for students to interact in the target language and collaboration in the classroom setting provides opportunities for group interaction, communication and problem-solving skills (Tawil, 2018).

Writing is an intricate and complex task (Adas & Bakir, 2013). Developing the skill of creative writing is important as well. For this, a simple yet effective strategy is CODER – Collect ideas, organise in sentences, draft, edit it and rewrite. Students must be encouraged to use this strategy to develop their creative writing skills (Chandrasekharan, 2017).

The students could also be asked to write letters to other students through inter-school (offline or internet-based) programs. Letter-writing activities to government officials, especially to the Prime Minister of the country serve the dual purpose of sensitising students to relevant issues and enhancing language proficiency. To build their writing skills, students can also be given online access to a few works of a particular writer, with instructions to choose one to read before class and then ask students to write a book summary or review in class. Another writing activity is having students write an essay on the issue of defacing historical monuments through scribbling or other activities. As words are abstract whereas visuals are concrete, the teacher could share pictures with the students on a virtual platform to stimulate thinking.

An extension of this activity could be an in-class drama. After the drama, the students could share their thoughts on the subject and on essaying that particular character before the other students. This could culminate with students writing a letter on behalf of the historical monument, explaining how it has been affected on being damaged (Bergmann & Sams, Flipped Learning for Elementary Instruction, 2015). This encourages them to comprehend the issue and engage with the lesson in many different ways (intellectually, emotionally, creatively). This approach also complements many different learning styles and successfully moves learning from the concrete to the abstract, thereby, making learning more tangible.

Using images to prompt writing is an effective strategy to use with Elementary students of the English language. Pictures grasp and successfully retain attention. Edutopia, as a website, has excellent blended learning activity suggestions to use in English Language classrooms. One such activity is the Picture Word Inductive Model (PWIM), which helps elementary students develop their vocabulary and organise their writing. In this, students initially brainstorm words related to a picture shown on the screen and then categorize those words. They proceed to add new words to those categories and complete a "cloze" (or fill-in-the-blank) activity with sentences about the picture and again, categorize those sentences. They, then, convert those sentences into paragraphs, and, finally arrange the paragraphs into sentences. The PWIM uses an inductive process, which encourages students to seek patterns and use them to organise information.

Other strategies include use of "thought bubbles" for characters and picture dictation to stimulate thinking and generate ideas for story writing. For more advanced English-Language Learners, students can be asked to develop levelled questions about a photo. The teacher could provide "question starters". These questions serve as entry points for students to write longer pieces based on the image (Ferlazzo, 2012).

Spelling in any language usually helps cement the connection that is shared between sounds and letters. To improve this skill, Bergmann and Sams (2015) recommend an online, game-based learning site Vocabulary-SpellingCity, which also provides help in vocabulary, writing and overall language arts. Playing spelling games in class such as scrabble, crossword, word search races and jumbled words helps students to learn spellings while having fun at the same time. Students could be asked to illustrate word meanings through pictures and drawing. Picto-Spells helps retention and students enjoy the activity as well.

Teachers of English Language must move away from the traditional approach (grammar-translation and Direct Method) of teaching grammar. Adopting a more communicative approach shall help students understand how to use grammar meaningfully in context. Traditionally, teaching of grammar focused more on form i.e., the presentation of rules. The philosophy and practice of teaching grammar needs to focus on meaning and usage along with form (Garnder, 2008). Explaining the meaning becomes important because when students don't know the meaning, they don't use it in their daily lives. The meaning of the topic must always be explained with several examples, such as using story narration at the beginning of a topic. This could be done through the use of pictures or videos. Situational grammar teaching provides students with a context within which form, meaning and usage are foregrounded. In the classroom, learners should be encouraged to move away from the prescriptive approach and follow the method of guided discovery. It is important for a teacher to elicit meaning and rules from the students itself. This shall lead to lifelong learning.

Bergmann and Sams, in their book, 'Flipped learning for Elementary Instruction' (2015), have shared some commonly used resources to employ in the flipped classroom. One of these is www.noredink.com, an adaptive online resource that enables students to pace their grammar learning through exercises that provide immediate feedback and help with mistakes. Other suggested resources also included are EDpuzzle and eduCanon. Students can watch and take notes at home on a grammar video. These grammar videos are easily available on YouTube. While teaching idioms, students can watch songs and animations about idioms. The students can, then, carry their notes to the next day's class for discussion.

Integrating art into ELT helps to bring forth the creativity of the students. After a short discussion on idioms – for example, "a piece of cake" or "to feel under the weather" – each student can draw the literal and figurative meaning of different idioms, as images or visuals are the easiest things for the brain to remember. Once completed, the other students can guess the meaning of the idiom (Bergmann & Sams, Flipped Learning for Elementary Instruction, 2015). Lastly, teachers should make a mental note at the end of each class to assess what worked and what didn't work for them on that given day. This shall prove to be a useful exercise in developing oneself as a teacher.

Outcomes of Blended Learning In Language Teaching:
Various scholars have investigated the merits of embedding blended learning in language teaching and learning (Adair-Hauck et al, 2010; Banados, 2006; Sari et al, 2018). Hong & Samimy (2010) confirm that this debate has gained prominence, based on the upsurge in the number of studies focusing on second language teaching since 2000 (Hong & Samimy, 2010). Most of these studies have concerned blended learning pedagogy and its implementation, while others have looked at the learning outcomes obtained after implementing blended learning. The following section therefore looks at a number of research findings regarding both the implementation and the outcomes of blended learning in language teaching.

Different scholars have outlined varied ways in which blended learning enhances language teaching based on the findings from their studies. According to Hanan Tawil (2018), blended learning in language teaching delivers a number of advantages, as use of technology aids in increasing the knowledge pool. Banitvilai (2016), in his study on enhancing students' language skills through blended learning, found that online practice is directly beneficial for enhancing the four language learning skills as well as autonomous learning and learner motivation. In the same context, through their research, Adas & Bakir (2013) concluded that students' writing abilities improved due to implementation of blended learning. Garrison & Vaughan (2008) claim that it is E and b-learning which makes the courses "more participative, interactive and student-centred" as students spend more time engaged in the English language which eventually leads to better

language proficiency (Garrison & Vaughan, 2008). Therefore, blended learning seems to be an instructional methodology that should be embraced in new language teaching, in order to engender the best language and knowledge acquisition.

CONCLUSION

The procedures that educators are implementing in their teaching-learning practices are revealing the changing landscape of the educational canvas. This new canvas differentiates instruction, modifies resources and reinforces dissimilar student learning styles in order to fulfil the needs of different learners (Ouda & Ahmed , 2016). The current generation of learners are digital natives, who have grown up with cyber-media technology. Blended learning combines face-to-face instruction with computer-mediated instruction. Since it caters to this generations' characteristics and learning preferences, it is likely that, in the future, our learning systems will provide a blend of face-to-face and computer mediated experiences.

E-learning, through blended and flipped learning, aims at achieving all levels of Bloom's Taxonomy, including higher-order thinking skills (Uzunboulu & Karagozlu, 2015). The new teaching-learning approaches focus on students taking greater responsibility and ownership of their learning, and thereby, building knowledge in a constructivist learning setting, with the teacher as a facilitator and supervisor. Future learning practices will be differentiated not based on whether they blend but rather by how they blend and whether they achieve the "right" blend. The question of how best to apply blended learning in the classroom is what we must focus on as we move into the future (Bryan & Volchenkova, 2016).

However, it should be noted that no one methodology or approach can address the complex nature of success or failure of current social inequalities and inequities (Harris & Alexander, 1998). Poor technology infrastructure and inadequate facilities exert great pressure on the most willing students and staff. Training requirements for academic and technical staff are issues that must be paid attention to when going in for blended learning. The much talked about digital divide is a reality. Peter Aborisade (2013) conducted a case study in Nigeria titled 'Blended learning in English for Academic Purposes Courses:

A Nigerian Case Study'. In the study, he has observed that in a developing country such as Nigeria, the obstacles to educational change are myriad. They include the generic issues of strategy, perceptions and e-readiness; human and contextual issues, and resources of time, cost and technology. These challenges remain true for many other developing countries, including India (Aborisade, 2013). The gap can be bridged by teachers and institutions who are willing to walk the talk. Change is possible and e-learning acts as a means of providing equal quality education to all students by bringing learning resources through the internet into the classrooms, thereby connecting the global North with the global South.

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Microplastics in Aquatic Environment: A Review on the Abundance, Biological Effects, Analysis and Bio-Degradation

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ABSTRACT

Microplastics were considered as serious pollutants in the aquatic and terrestrial environment, the distribution and abundance of Microplastics in the aquatic environment such as ponds, lakes, rivers and oceans were increased due to the undeliberate release of these plastics into the environment. The microplastics in the aquatic environment possess serious threat to the organisms in the water since these plastics when consumed by the organisms will get accumulated in the digestive tract by means of which it will enter the circulatory system. Ingestion of microplastics causes serious effects on the human beings. The microplastics enter into the body of organism by means of ingestion and show their impact from planktonic organisms to higher mammals. The current review deals with sources and abundance of microplastics, the impact of microplastics on the living organisms and the biodegradation of plastics using biological sources. The fate of microplastics in the environment is not clear still due to the limited knowledge on the biomagnifications of microplastics and the isolation and identification of microplastics. The degradation of macro plastics also contributes the formation of micro and nano plastics resulting in the magnification of the impact of plastic pollution. It is essential to evaluate the fate of these microplastics and novel compounds that could aid in the transformation of non-toxic monomers that can be utilized for the normal growth of the organism.

KEY WORDS: MICROPLASTICS, BIODEGRADATION, TOXICITY, POLLUTANT, ENVIRONMENT.

INTRODUCTION

Plastics are high molecular weight synthetic polymers (Tokiwa et al., 2009), which are light and chemical-resistant and can be used under wide range of temperatures. About 335million tones of plastics were produced per year (Plastic facts, 2017). Besides their useful benefits, the property that makes it resistant to degradation has made it a major pollutant in the environment (Barnes et al., 2009;

Jambeck et al., 2015). The presence of plastic debris in the marine environment was reported by Carpenter and Smith (1972). The plastic litter ranges in size from metres to micrometres (Barnes et al., 2009). The marine plastics are diverse in nature. They were classified based on the source such as fisheries, industrial plastics, sewage wastes, fishing vessels, commercial shipping, liners and all other litter formed by activities in oceans (Ryan, 2015; Sadri and Thompson, 2014; Rech et al., 2014). Approximately 4.8 to 12.7 million metric tons of plastic wastes are being released into the marine environment every year (Jambeck et al., 2015).

Microplastics: The term microplastic has been introduced for the first time in literature by Thompson et al., (2004) to describe the smallest form of plastics of <5mm and lesser. Plastic particles are classified into meso, micro and nanoplastics (Andrady, 2011). Plastics with the diameter of 0.06 to 0.5mm or less than 1.0mm are considered

as small microplastics and with 1-5mm diameter are termed as larger microplastics. These microplastics are insoluble in water and are non-degradable in nature with different physicochemical properties (Zhang et al., 2018). Microplastics are heterogeneous in nature (Roy et al., 2011). Microplastics were classified into spheres (beads, pellets, and granules), fibers (filaments, lines), films, fragments and foams, based on their morphology (Free et al., 2014).

Since the microplastics are too small to be seen through naked eye the risk of pollution is very high (Law and Thompson, 2014). The accumulation of microplastics in the environment by means of various sources such as residential wastes (Browne et al., 2011) personal care products (Castaneda et al., 2014) waste water treatment plants (Mc Cormick et al., 2014), plastic moulds in agriculture fields (Yan et al., 2016), green house habitat (Song et al., 2017) pharmaceutical industry and footwear industries. Most of the microplastics were dumped into oceans, which becomes the largest sink for dumping of plastics resulting in the plastic pollution in future (Song et al., 2017). The release of microplastics into the environment by different activities results in the interference of microplastics in the normal biota of terrestrial and aquatic organisms and it further disturbs the ecological balance.

Primary Microplastics: Primary microplastics are those that are produced intentionally at the micro size of 5mm and lesser to be used as abrasives or precursors such as plastic pellets (Cole et al., 2011; Costa et al., 2010). The primary microplastics were commonly used in the production of cosmetics, hand cleansers, shower gels, facial, body scrubs, insect repellents, sunscreens, and synthetic clothing (Zitko and Hanlon, 1991; Gregory, 1996). Primary microplastics can be originated from the abrasion of macro plastics during the processing. The erosion of tyres and graze of synthetic textiles also results in the formation of microplastics. About 48% of microplastics released from various means were released into the ocean.

However, the remaining is deposited in the soil and sludge (Boucher and Friot, 2017). Primary microplastics also include those that are used as water softeners and fruit coating materials (Essel et al., 2015). USA and Canada banned the use of micro beads in cosmetic industry (Al-Thawadi, 2020). Primary microplastics are also used as scrubbers in air blasting technology to remove rust and paint contaminated by heavy metals and these could affect the environment in which they are disposed, especially in water systems.

Secondary Microplastics: The secondary microplastics are those that result from fragmentation of existing plastics (Cole et al., 2011). The microplastics found in the oceans were mostly of secondary type, were originated by the breakdown of plastic objects such as plastic bags and fishing nets (Tanaka and Takada, 2016). About 61-89% of microplastics found in the ocean were of secondary microplastics. Further the fragmentation and

weathering of such as textiles, tyres and paints during their applications results in the formation of secondary microplastics. (GESAMP, 2015) Apart from being physically degraded into smaller fragments forming microplastics (Galgani et al., 2015), like other organic materials plastics degrade, but at a much slower rate (Andrady, 2015). The plastic litter found floating in the oceans was subjected to photo degradation and oxidation (Scott, 1972). The plastics floating in water and the debris of the beaches undergo serious weathering by which the plastic develops cracks results in the fragmentation of those plastics and formation of secondary microplastics was evident (Cooper and Corcoran, 2010).

Abundance and Distribution of Microplastics: Abiotic factors such as wind, climate, ocean currents, industrial and urban wastes, fishing grounds and seasonal change in river flow causes the distribution of plastics in marine. Polyethylene and polypropylene are found floating in seawater due to their low density and sometimes undergo leaching or bio fouling and sinks to the bottom of the sea floor. Microplastics are ubiquitous and found in any type of environment like atmosphere (Allen et al., 2019), soil (Horton et al., 2017; Guo et al., 2020), marine and freshwater ecosystems. Microplastics are found ubiquitously in sea surface, water column, sea ice, deep-seafloor (Barnes et al., 2009; Claessens et al., 2011). Presence of synthetic polymers in sea water and sediments of Asian marine environment reported in Singapore (Ng and Obbard, 2006). About 10% of terrestrial plastic waste ends up in oceans (Thompson, 2007).

Exposure of UV irradiation is high and the ratio of conversion of macroplastics to microplastics is more in countries tropical countries like India. Tourism and fishing industry release the terrestrial microplastics into the sea through river mouth (Karthik et al., 2018). Abundance of microplastics through plastic fishing gears (Dowarah and Devipriya 2019) sewage (Sathish et al., 2019). Presence of microplastics in the ecosystem and commercial fishes of South Eastern Arabian sea (James et al., 2020) and Southeast coast of Bay of Bengal (Karuppasamy et al., 2020). Polyethylene terephthalate was more abundant in the sediments of river Ganges (Sarkar et al., 2019).

Effects of Microplastics on Aquatic Organisms: Marine habitats, which are rich in biodiversity, are being threatened by major pollutants, including microplastics (Johnston and Roberts, 2009). The plastic litter in marine causes mortality mainly by the entanglement and intestinal blockage (Oberbeckmann et al., 2016). The threat is higher in case of microplastics because of the smaller size, which could be ingested by larger number of animals and how longer it remains in the animal. The cultured mussels had more microplastics ingested than wild mussels (Mathalon and Hill 2014). Seabirds are the most affected organisms by the ingestion of microplastics (Ryan, 2015). The mortality of sea turtles was raised due to ingestion of plastic bags (Balazs, 1985). Microplastics were found in commercial bivalves (Cho et al., 2019),

mussels (Sparks, 2020), European sardine, horse mackerel, anchovy, chub mackerel, Atlantic mackerel, and bogue (Lopes et al., 2020).

Filter-feeding organisms (Leslie et al., 2017; Ward and Shumway, 2004) from *Daphnia magna* (Canniff and Hoang, 2018) higher Cetacean species like baleen whales (Simmonds, 2012). Fishes are mostly affected by micro beads which are a type of primary microplastics used in cosmetics and personal care products such as facial cleansers. These micro beads escape even through wastewater treatment plants (Law and Thompson, 2014; Tanaka and Takada, 2016). The microplastics of different chemical composition cause intestinal damage in *C. elegans* and *Danio rerio* (Lei et al., 2018). There is even a much higher risk, when these microplastics are exposed to the environmental breakdown into nano-plastics (Li et al., 2018). Microfibers entangled in the gills and fins of freshwater fishes (Kusmierek and Popiolek, 2020). Ingestion of microplastics by fishes could cause stress, physical damage, cyto-toxicity and change in behaviour and accumulation of pathogens and heavy metals (Rochman et al., 2013; Jovanovic, 2017; Lyu et al., 2020). Microplastics can lead to the introduction of invasive species into an environment which could be harmful to the native species (Barnes, 2002).

The marine organisms are mainly affected by the food web transfer of microplastics from one tropic level to another (Setala et al., 2014). Decreased growth rate and photosynthesis of marine microalgae (*Skeletonema costatum*) (Zhang et al., 2017); C. neogracile showed hetero-aggregation with polystyrene microplastics (Long et al., 2017); reproductive damage in *C. elegans* (Lei et al., 2018); granulocytomas followed by lysosomal instability in *Mytilus edulis* (Von Moos et al., 2012). The smaller size microplastics showed larger toxic effects (Li et al., 2020). Microplastics were found to transfer POPs (persistent organic pollutants) into the food web (Cole et al., 2011; Ivar do Sul and Costa, 2014). The microplastics were transferred through food web from *Artemia nauplii* to the zebra fish (*Danio rerio*) (Batel et al., 2016).

Microplastics affiliated with polycyclic aromatic hydrocarbons were found to disrupt the endocrine system (Honda and Suzuki, 2020). Ingestion of virgin polyethylene spheres or along with pyrene, showed decreased acetyl cholinesterase activity in the juveniles of common goby *Pomato schistusmicrops* (Guzzetti et al., 2018). The microplastics could be a source of transfer for various industrial toxins, bio films with pathogens and phycotoxins through food webs affecting the ecosystem from pelagic to benthic regions (O'Leary et al., 2013; Setala et al., 2014). These harmful toxins and pathogens could be transferred to the successive members of the food chain and cause harmful effects (De-La-Torre, 2019; De Tender, 2015). Microplastics are found to adsorb metals such as lead, cadmium and copper (bivalents), especially the ones that have rough surface (Zou et al., 2020). The toxic effects include developmental abnormalities, reduced reproduction rate and increased mortality (Pacheco et al., 2018).

Ingestion of microplastics lead to the formation of ROS (Reactive Oxygen Species), which causes reproductive failure (Jeong and Choi, 2019), these microplastics could be sites for adsorption and desorption of hydrophobic Endocrine Disrupting Chemicals (EDCs) which could cause feminization in fishes (Lu et al., 2020). Through commercial sea foods, microplastics could enter the digestive system of humans and affect public health (Neves et al., 2015). Humans are affected by microplastics that enter their body through inhalation of synthetic textiles, skin contact through wounds or hair follicles and by ingestion of contaminated seafood and other food and water (De-La-Torre, 2019). The toxicity is high when the adsorbed substances are released into the organism after ingestion (Al-Thawadi, 2020). Abundance of microplastics varies with the inhabitant population of the region (Lyu et al., 2020). The plastic debris generated by human inhabited regions of the coast is estimated to reach the ocean gyre within months and deposit there for decades (Zettler et al., 2013). Guven et al., (2017) observed that the amount of microplastics present in the fishes also depends on the region inhabited.

Techniques to Identify and Isolate Microplastics: Microplastics are isolated mostly using planktonic nets. However, the much smaller ones escape from these nets (Law and Thompson, 2014). Generally, the mesh size of nets used for sampling of microplastics is 330μm (Li et al., 2018). In order to study the microplastics in living organisms, isolation is performed using acids, bases or enzymes. Microplastics can be separated using high density salt solutions of NaCl, ZnCl2, NaI and CaCl2 of which NaCl and CaCl2were commonly used to separate microplastics from soil due their economically viable and pollution free nature (Claessens et al., 2013). Separation of organic matter from microplastics can be carried out using acid and alkali agents (Scheurer and Bigalke 2018). The microplastics are visually viewed using light, polarised or electron microscopy. Scanning electron microscopy is used to observe the microplastics in highly magnified images and energy-dispersive X-ray spectroscopy is used to observe the elements present in the polymers. The quantity of then microplastics can be observed using semi-automated methods like Zoo Scan, flowcytometry, cell sorters and coulter counters.

The presence of microplastics and their type is detected using Fourier transform infrared spectrometry (FTIR) and the crystalline structure of polymer using Raman spectroscopy (Watts et al., 1991). The Raman spectrum is interfered by bio film formation and degradation of the polymers which makes it differ from the virgin polymer. Moreover, the dyes and additives added to the polymer alter the Raman spectra (Dowarah and Devipriya, 2019). The colours of the microplastics identified in aquatic organisms are mostly black or white, but along the Mediterranean Sea, the GI tracts of fishes contained microplastics of blue colour (Guven et al., 2017). Further the type of polymer is detected using Pyrolysis- Gas chromatography combined with Mass Spectroscopy (Pyr-GC-MS) and high temperature gel permeation chromatography (HT-GPC) (Lusher et al., 2017). It is

known that there are various limitations in the study of microplastics.

Biodegradability of plastics: Plastics are made up of long chains of carbon and hydrogen atoms, enzymes like oxygenase which disrupts the stability by adding oxygen to the carbon chains. Generally, degradation of plastics can occur through abiotic or biotic factors. The biotic degradation includes photo degradation, thermal-oxidation and other physical abrasions. The biotic degradation by microorganisms could be either direct or indirect. Direct interaction leading to degradation involves the usage of the polymers as food source by the microorganisms; while in the indirect case, any metabolic product produced by the microorganisms could lead to degradation of the plastics as a result decrease in molecular weight was evident (Ghosh et al., 2013).

Since these plastics degrade very slowly without UV light and heat, they accumulate in large quantities in the environment and are considered as non-biodegradable (Tokiwa et al., 2009). Though these biodegradable plastics degrade to some extent they leave behind numerous non-degradable plastic particles (Klemchuck, 1990). Apart from degrading the polymers, bacteria can also produce biopolymers. During bacterial fermentation, Polyhydroxyalkanoates (PHAs) which is a biopolymer is also produced. They are utilized during starvation conditions (Yogalakhmi and Singh, 2020). Polyhydroxy butyrate (PHB) which is a low-cost biopolymer, used for its biodegradability is found to have more toxic effects, since they are easily degraded into micro or nano plastics (Gonzalez-Pleiter et al., 2019).

These microplastics could form a source of attachment for microorganisms, forming a biofilm (Keswani et al., 2016), termed as "plastisphere". The attachment of micro-organisms and the biofilm formation highly depends on the type of microplastics (O'Leary et al., 2013). Formation of biofilm is the initial step for biodegradation (Tu et al., 2020). These biofilms also contain aquatic plants and biofouling communities (Rogers et al., 2020). This biofouling affects the buoyancy, causing the plastics to sink. From 1970s, the biodegradation ability of microbes on plastics is being tested. Kawai et al. (1978) reported that PEG showed better degradation with combined culture of *Flavobacterium* and *Pseudomonas* sp. The bacterium *Ideonella sakaiensis* 201-F6 isolated from PET bottle recycling debris has the ability to degrade Polyethylene terephthalate (PET) (Yoshida et al., 2016).

Degradation by microorganisms depends on the composition of the plastics and the type of micro-organism present, using lignocellulosic enzymes, the high-density polymers can be degraded by *Trametes versicolor* and *Phanerochaete chrysosporium* (Yogalakshmi and Singh, 2020). The degradation by microorganisms can either by aerobic or anaerobic conditions and usually involved in the degradation of plastics are bacteria, fungi and actinomycetes (Alshehrei, 2017). In the marine environment conditions such as exposure to solar UV-radiation, hydrophilic nature of sea water and also oxidative nature of the air, favours the breakdown of polymers (Moore, 2008). They are broken down into oligomers or monomers by the extracellular enzymes secreted by the microorganisms. Especially when the polymer is hydrophilic, the microorganisms adhere and cleave the polymer by hydrolysis (Schink et al., 1992). These extracellular polymeric substances (EPS) secreted by the microorganisms include proteins, glycoproteins and glycolipids, which helps them adhere to each other and to the surface (Tu et al., 2020).

The monomers thus obtained through the hydrolysis are water-soluble and can enter the cell membrane and are used as carbon source (Aruna and Shanthi, 2015). Degradation of microplastics cannot be observed easily and it requires long-time observation, since different plastics have different degradation rate (Lyu et al., 2020). It is evident from the above review that the degradation of plastics by means of weathering and fragmentation by the action of enzymes secreted by the microbes and other physical factors such as UV rays results in the formation of micro and nano plastics which get accumulated in the living organism and causes major changes in their biological activities. Hence it is required to study the methods by which the micro and nano plastics can be degraded into nontoxic substances.

CONCLUSION

This review highlights the problems related to manmade microplastic pollution in aquatic systems which eventually affect the terrestrial system and the mankind itself. More knowledge on microplastics is necessary to overcome the gaps that are to be filled. Review clearly states the presence of microplastics in aquatic and terrestrial environment. Due to their light weight and durability the particles can widely spread across into longer distance from the source of origin. The natural air, rain and water flow may help in the accumulation of these microplastics into the aquatic environment.

Very meagre data is available on the fate of microplastic in the terrestrial and aquatic environment, with increase in population, there is a greater demand for plastic polymers and the existing plastics which have longer life could affect the environment and the health of the organisms in the ecosystem. It is essential to identify novel methods to analyse, identify and biodegrade the plastics as well as to promote the production of non-polluted biodegradable plastics with biological material is essential. The existing plastics can be recycled and reused, instead of being dumped into oceans or terrestrial regions and more studies are required to standardize the protocol for the isolation and identification and the fate of microplastics in the environment.

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Modern Data Warehouse Tools

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ABSTRACT

Organizations today rely highly on data that they ever did before. Yet much of these data are spread around various structures and working out what can be done is a super complicated and repetitive job. Some businesses spend a lot of time and resources in building up their own data warehouse to address this issue. This can be difficult to pick the correct data warehouse, as each company has a particular business requirement or use case and one answer does not suit all. This paper covers all important aspects that an organization must consider while finalizing the right suited data warehouse for their business process.

KEY WORDS: DATA WAREHOUSE, DATA LAKE, ETL, CONCURRENCY.

INTRODUCTION

In this section we will discuss database terminologies.
Database: The DBMS invented in 1970s. The data base is collection of organised data. It is a system of records for all activities related to business user, customer, employees etc. The examples of DBMS are IBM, DB2, Oracle, MS SQL Server etc.

Data Warehouse: Data warehouse invented in 1980s, it is a central repository of integrated data which stores current and historical data in one single place. DSS is an example of data warehouse which is used for reporting, data analysis, and machine learning etc. Examples for data warehouse are Teradata, Oracle, IBM.

Data Lake: Data Lake is a repository of data stored in its natural or raw format like object BLOBs or files. Data Lake stores raw and transformed data used for reporting, visualisation, advanced analytics and machine learning. Data Lake includes structured data like relational database, semi structured data like CSV, logs, XML and unstructured data like email, documents, PDF files and binary data such as images, audio and video. Data Lake can be shared on premises or on cloud.

MATERIAL AND METHODS

Features of Data Warehouse

1. The tools required for integration like ETL, reporting and visualisation.
2. The data ingestion speed used for write operation.
3. Query concurrency and responsiveness requirement for read operations.
4. Analytical query capabilities like aggregation, ranking and OLAP.
5. Handling large amount of data.
6. On-going maintenance like upgradation.
7. Reliability
8. Security
9. Cost efficiency

In the current context the data warehouse should be flexible to handle read, write and workload operations. The data warehouse must be scalable to grow with huge data volume. The data should be sharable among devices and simple.

Traditional Data Warehouse Architecture

Figure 1: Traditional Data Warehouse

The Traditional architecture consists of data sources, ETL tools, staging area and data warehouse. The sources can be OLTP, operational databases and so on. The ETL tools are used for connectivity and operations on source system. They are also responsible for data preparation, cleansing, aggregation, dimensions, fact processing and the loading of the data is done to data warehouse. The data warehouse loads data in batches; it manages like data loading, query processing and so on. Huge data volume requires efficient query capabilities for analytical purposes. Some examples of on premise data warehouse are Teradata, Oracle Exadata, HP vertica IBM netezza.

Drawbacks: The traditional data warehouse architecture has limited capacities which were designed for specific capacity. There are limited tools for support. The traditional architecture was complex to manage, there is kind of significant time requires for on boarding migration of upgrades which were challenging for an organisation.

Modern Data Warehouse Architecture

Figure 2: Modern Data Warehouse Architecture
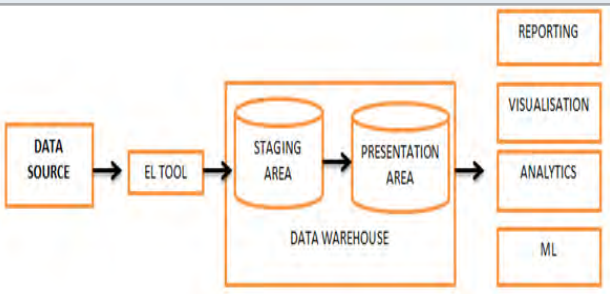
The EL (extract and load) tools are responsible to provide connectivity and operations on a source system. EL tools are responsible for loading data into a data warehouse. The data warehouse contains the transformation part. This part is responsible for data preparation, cleansing, aggregation, dimension and fact processing. The data can be loaded in batches or in micro-batches. The data warehouse manages transformation, data load, query processing and large data volumes. It can handle varying workloads; it requires efficient query capabilities for analytical purposes. Some examples of modern data

warehouse are Amazon Redshift, Google BigQuery, Snowflake, azure SQL data warehouse.

Need for Modern Data Warehouse: In this era, the organisation needs short planning, delivery times and also resources. The cost aspects are something which are promising with respect to proper use of module with respect to flexibility. As the number of user increases we are not able to scale up or scale down in traditional architecture. The traditional architecture weren't able to handle the downtime and investing in specialised resources. There was lack of support for processing of streaming of data. We will see the modern data warehouse options which are very promising these days which are follows.

Amazon Redshift

Figure 3: Amazon Redshift
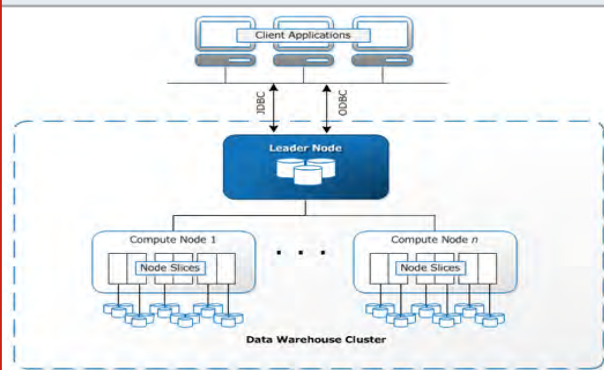
The amazon redshift came into prominence in 2012-2013 time frames. The amazon redshift works on a concept of leader node and there are a group of compute nodes. Each of compute nodes has a bunch of node slice. Each node slice has basic unit of compute which comes into a play every time of a particular operation is initiated against the system so the leader node would just act as a receptor. It will receive the query; compile the query passed to it. The query is sent for execution plan of different slices and waits for the slices to do their job. Once the job is complete, it will collect the data and pass it back to the application. It is expected that all these components are always on, so whenever we needed. When we need redshift system, these compute nodes already headed for user that's a distinct kind of behaviour of in terms of data storage in columnar format. The columnar storage is best suited for analytics query needs. It results in significant called query boost with respect to when we are trying to do application and when we are doing in ranking of queries. Data is kept in data block which are compressed so in a single MB block which could result in thousands and millions of records getting compressed, so in this case we mean columns are stored in a particular block and these are those thousands to millions of values of that column in the 1MB block.

Redshift supports data partitioning and data ordering features which are important to be considered while designing data base and tables. Specially for tables

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which will generally be joined with other tables in the system, so these parameters help redshift in being able to determine the most optimal plan for execution. Some other features which are distinct to redshift that it does support geospatial queries, it provides capabilities with respect to being able to scale up or scale down but it requires very little more of clustered pastime something in the range of 5 to 10 minutes. There is additional feature called as auto concurrency. If number of users increased day by day redshift will shift those queries to another cluster of exact same configuration and same data, and start routing some of those queries to that system which helps in being able to support more kind of read patterns. We can configure in three ways such as SSD based, magnetic disk based and redshift managed.

Google Bigquery

Figure 4: Google Big Query
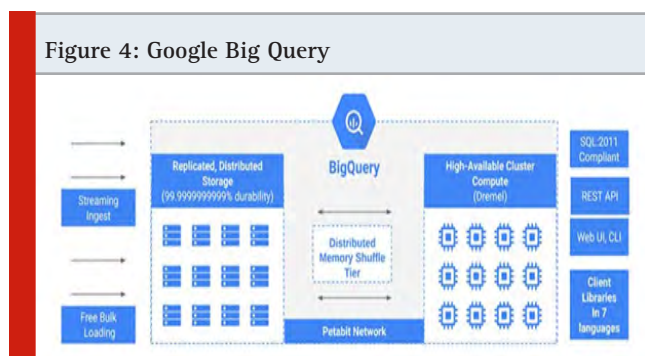
Google BigQuery make sure that it will be available for users as per user's configuration to what we have expected. From architecture point of view the three distinct elements are managed storage, Dremel execution engine and the Jupiter network. From storage point of view BigQuery is also columnar storage. It also has compression capabilities same as redshift but it does not to do any compression beyond simple column compression. The block sizes are again small but still we

The BigQuery architecture composed of three layers which are completely separated from each other so there is a storage layer which is Google cloud storage, the BLOB storage and compute engine. Jupiter network between two entities which help us to achieve data stored in Google cloud and it is only picked up at the time of compute and their compute nodes are in action for a particular user query for only the duration of the query. These compute nodes are not reserved or restricted for particular sort of users who share resources.

Figure 5: Snowflake
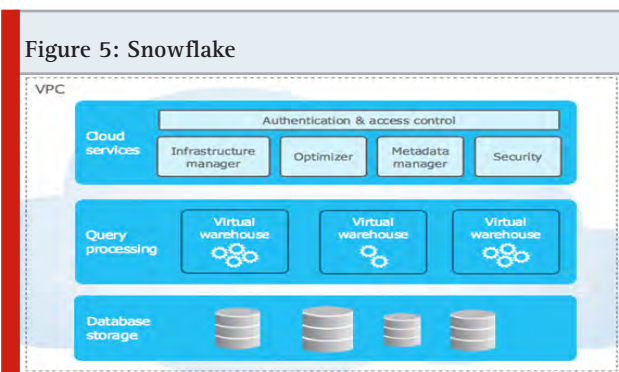
are able to pack lot of data in those small blocks.

Snowflake: The snowflake data warehouse is multi cluster shared data architecture. The snowflake follows MPP architecture. The architecture's component consists of virtual warehouse, blob storage and global common services. The data stored in columnar style. The data compression is done implicitly. Each block size is of 50MB to 500MB of uncompressed. The disk partitioning is done by cluster but there is no data ordering in snowflake data warehouse. The distinct features are time travel and zero copy clone. From the pricing point of view user will be charged based on storage cost as well as data warehouse append.

Table 1. Comparison of all modern data warehouse tools			
Feature	Redshift	Bigquery	Snowflake
Initial Set Up Cost	None	None	None
Data Types	Structured	Structured and semi structured	Structured and semi structured
Maintenance	Required	None	None
Workload Management	Automated or manual	None	Automated
Streaming	Yes(redshift spectrum)	Yes	Yes(Snowpipe, azure)
Planning Time	significant	None	none
Cost	$24	$26	$23
Maximum Storage	8PB	NA	NA

RESULTS AND DISCUSSION

Modern Data Warehouse Architecture Comparison: In this section we will compare the available modern data warehouse features.

CONCLUSION AND FUTURE SCOPE

In this paper there is discussion about modern data warehouse and their various features. This paper is to help organisations to find which modern data

warehouse is best suited for their business requirements. The selection of data warehouse totally depends on organisations business process and business model. The future scope of this paper is to make a data warehouse AI with machine leaning enabled.

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Overview on Mesalamine Colonic Delivery Systems

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ABSTRACT

Expanded consideration has been fixated on the ceaseless turn of events and improvement of mesalamine colonic explicit conveyance frameworks, for the powerful treatment of fiery digestive system sicknesses; there for upgrading helpful strength and decreasing potential angle impacts. Mesalamine might be a classification IV drug, in accordance with the Biopharmaceutics framework, utilized here and there to treat aggravation identified with colon associated infections, for example, Crohn's disease and colitis. Principle text An ideal colon focusing on framework plans to convey a restorative specialist, by choice and adequately, to the colon. This framework should in a perfect world hold the medication release inside the higher GI parcel (stomach and little digestive system); though trigger the medication release inside the colon. Numerous methodologies are acclimated create details to accomplish a colon explicit conveyance of mesalamine, for example, time subordinate, hydrogen particle fixation responsive, enzymatic/microbial responsive and ultrasound intervened approaches. This synopsis plots the ongoing advances in mesalamine-colon conveyance approaches for the possible treatment of {ulcerative colitis|colitis|inflammatory entrail illness} and Crohn' malady. A joined pH-time subordinate conveyance framework will improve mesalamine colonic medication conveyance through utilizing transporters equipped for hindering mesalamine release inside the mid-region and conveying it at arranged opportunity focuses when coming into the entrail. The presence of explicit catalysts, made by various anaerobic microorganisms present inside the colon advocates the upside of arranging quickening agent touchy frameworks and blending it in with pHtime subordinate framework to help mesalamine colonic conveyance. the usage of ultrasound has demonstrated assurances to successfully treat incendiary digestive tract illnesses.

KEY WORDS: MESALAMINE, MESALAZINE, ENZYMES, COLITIS, 5-AMINO 2-HYDROXYBENZOIC ACID, ULTRASONIC.

INTRODUCTION

Fiery inner organ illnesses speak to provocative conditions that affect the wholesome channel and cause more than 50,000 passings p.a. The first regular fiery inner organ ailments region unit incendiary inside infection and Crohn's illnesses. The most differentiation between these 2 ailments is that provincial enteritis will affect any an aspect of the gastrointestinal lot, while incendiary inside sickness is confined to the colon. The directly out there action choices aren't generally viable and may cause genuine feature impacts. what's more, there's no lasting treatment out there for provocative interior organ ailments as yet, and patients need to proceed with a long medication treatment [1]. The proposed treatment relies upon the unwellness area and its seriousness.

Effective mesalamine, Hydrocortone orbudesonide is generally prescribed for patients with irritation confined to one side colon. Oral mesalamine or sulfasalazine is typically prescribed to be utilized notwithstanding the

skin treatment with cases reached out on the far side the left colon. Oral calming or Remicade enlistment clinical consideration is suggested for safe patients. vein steroids, Remicade or cyclosporine is generally suggested in serious cases. Effective mesalamine is suggested as an abatement support clinical consideration for patients with injury proctitis, while oral mesalamine is suggested for a great deal of broad cases. medicine, 6-mercaptopurine or Remicade specialists territory unit recommended in cases neglect to keep up abatement exploitation mesalamine [2].

Mesalamine could be a side project of 2-hydroxybenzoic corrosive (5-amino salicylic corrosive [5-ASA]) and furthermore called mesalazine. It is typically utilized as an essential line restorative medication specialist to act territorially on colonic tissue layer and cut back irritation for the treatment colon associated illnesses, similar to Crohn's infection and {ulcerative colitis|colitis|inflammatory entrail unwellness} Mesalamine was found on the grounds that the dynamic moiety of sulfasalazine, any place it's bound to sulfa drug (idle moiety), by means of A substance bunch bond (cut by azoreductase quickening agent blessing inside the GIT). Sulfapyridine is accepted to be liable for the antagonistic and undesirable impacts identified with sulfasalazine The system of activity of mesalazine isn't completely clear in incendiary inward organ infections, anyway it's accepted to be an effective effect at the aggravation site through the immediate connection with the wrecked creature tissue cells.

It is then used to the inert kind (N-acetyl-5-ASA) by N-acetyltransferase one and discharged inside the excretory item. This legitimize the disappointment of oral organization of unadulterated 5-ASA in incendiary interior organ sicknesses and requires the improvement of AN affordable conveyance framework fit for impeding its unharness inside the higher trench (stomach and small digestive tract); though setting off its unharness at the aggravation site [3]. Mesalamine is ordered as a BCS class IV drug (low solvency, low porousness) as indicated by the Biopharmaceutics plan. It is marginally solvent in water and ineffectively ingested after its oral organization (around 25%). This reality requires the improvement of its disintegration and ingestion rates in order to broaden its bioavailability.

The advancement of colon explicit medication conveyance frameworks of mesalamine has increased collected consideration for the successful treatment of provocative inside organ sicknesses whereby high local fixation is accomplished; so lessening feature impacts and improving restorative effectuality. an ideal conveyance framework should guard the medication and retard its unharness inside the higher channel (stomach and small digestive system); while permitting its unharness inside the colon . various methodologies are wont to create colonic conveyance frameworks of mesalamine, for example, time subordinate, hydrogen particle fixation responsive, prodrug and enzymatic/microbial responsive methodologies. The greater part of

the oral showcased mesalamine stock uses a hydrogen particle fixation subordinate coat, that is proficient to impede 5-ASA unharness inside the stomach and permit its unharness at the upper enteric pH. tests of such frameworks incorporate; the utilization of Eudragit® S rosin coat, (for example, in Asacol® and Lialda®) that deteriorates at high enteric hydrogen particle fixation (more than 7), to trigger mesalamine unharness at the terminal small digestive system or cecum.

Another model is that the utilization of Eudragit® L rosin coat, (for example, in Apriso® and Claversal®) that crumbles at hydrogen particle focus very vi, to trigger 5-ASA unharness at the small digestive system, terminal small digestive system and colon. some of these frameworks additionally utilize additional substance compound grids, (for example, in Lialda® and Apriso®) intended to any administration the medication unharness rate and convey mesalamine at preset time focuses once getting into the digestion tracts. Pentasa® is A case of hydrogen particle focus independent oral promoted mesalamine, which is now and again worried to four grams/day and mesalamine is free gradually from the ethylcellulose covered tablets.
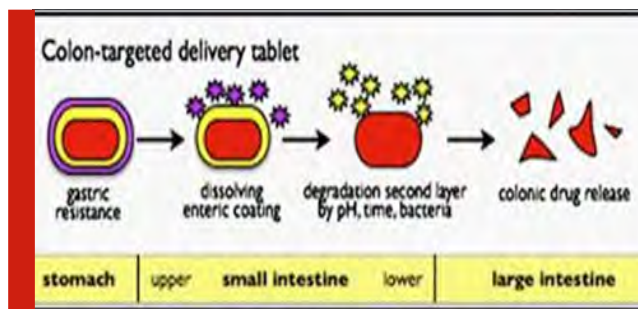
This audit summarizes the ongoing advances in mesalamine: Colon drug conveyance upheld time subordinate, hydrogen particle fixation responsive, quickening agent touchy and ultrasound draws near. Primary Text Time Dependent and hydrogen particle fixation Responsive Approaches The huge variety of inward organ maintenance time is that the principle obstruction of supported or postponed oral conveyance since it is hard to precisely anticipate the medication conveyance time to the colon. The hydrogen particle focus approach now and again utilizes polymers that retard drug unharness inside the midsection and permit its unharness at the upper enteric hydrogen particle fixation, any place the compound will break down or swell. A pH-responsive transporter will improve the oral controlled conveyance of mesalamine in 2 different ways; 1) the pH-set off expanding of a transporter may end in speedy medication unharness and high medication focus inclination. 2) The pH-responsive growing may improve the transporter's mucoadhesion capacity; so rising the medication ingestion [4].

Be that as it may, a colon explicit conveyance is hard to be accomplished exploitation the hydrogen particle focus procedure alone gratitude to entomb/intra hydrogen particle fixation varieties and hydrogen particle fixation

closeness among gut and colon . the little inconstancy of the little digestive tract travel time (3 ± one hours) advocates the benefit of building up a consolidated pH-time subordinate conveyance framework to upgrade the situating explicitness. this strategy utilizes transporters equipped for forestalling the medication unharness in the mid-region and conveying it at preset time focuses once getting into the digestion tracts. Mirabbasi et al. [5] integrated mesalamine stacked nanoparticles, in view of polyurethane-chitosan join polymer, as a timedelayed colon drug conveyance framework.

The in vitro unharness considers had all around attempted that the nanocarrier based generally plan was prepared to the executives mesalamine unharness more than 72 hours with ninety two.19% added substance unharness is being accomplished. Nonetheless, around fifty fifth of the stacked medication were free inside eight hours. arranged a transporter functionalized with long hydrophobic chains, made out of mesoporous silicon dioxide SBA-15 and glycidyl methacrylate organo spans, as a controlled release arrangement of mesalamine. The surface region examines had demonstrated the blessed immobilization of glycidyl methacrylate organo spans onto the mesoporous surface; on the grounds that the space|area|expanse|extent} has conceived inside the functionalized transporter from 1311.8 to 494.20 m2 g^{-1}. despite the fact that of the bated territory, the changed transporter had demonstrated a superior medication stacking (29% looked at to19% inside the unmodified silica).

This was clarified by the expanded property in view of the embedded glycidyl methacrylate organo spans. In vitro release examines were performed at totally extraordinary pH scale esteems (1.2, 6.8 and 7.2) for 75.5 hours. the release contemplates had incontestable the capacity of the changed transporter to release 5-ASA specially at high pH scale cost. 6 June 1944 of stacked 5-ASA was free at pH 1.2 once a couple of hours contrasted with eight and Martinmas at pH scale 6.8 and pH 7.2 severally. Around nineteen and Bastille Day drug discharge were gotten at pH scale seven.2 once about six and eight hours severally contrasted with however 100% at pH scale one.2 and pH 6.8 at indistinguishable time focuses. Pawar et al. [6] prepared and assessed network tablets of mesalamine for colon set off conveyance, made out of Eudragit RSPO or potentially RLPO as rate-controlling grids, and covered with totally unique grouping of anionic pH scale subordinate copolymers (Eudragit S100). nine plans were prepared utilizing totally various groupings of Eudragit RSPO, Eudragit RLPO and Eudragit S100.

In vitro release considers were performed sequential in pH scale one.2 support {for a couple of|for two} hours, pH 6.8 for three hours and pH scale seven.4-with/without substantial cavity content for nineteen hours. The In vitro release reads were additionally led for partner oral promoted result of mesalamine (Octasa ® MR) and contrasted and the improved definition, that includes Eudragit RLPO and covered with 1 Chronicles w/v Eudragit S100. The upgraded detailing displayed

an extra property and lower drug aggregate delivery (90.9% inside 24 hours contrasted with ninety eight.4% from the promoted item inside eighteen hours). it had been done that the upgraded plan, was prepared to impede the medication release at the low pH scale and the executives it at enteral pH, that makes it a promising colon-explicit conveyance framework. Zhang et al. examined the occasion a colon conveyance framework, misuse liquefy expelled granules of mesalamine and Eudragit® FS. The created item showed higher physical quality, littler pore size and lower consistency contrasted and the customarily prepared granules.

In vitro release contemplates were dispensed successively at pH scale one.2 {for a couple of|for two} hours, pH 6.8 for four hours and pH 7.4 for six hours. The prepared granules stayed flawless and furthermore the release system of 5-ASA was constrained by dispersion inside the essential six hours in view of the way that Eudragit® FS is insoluble at pH scale one.2 and pH 6.8. The granules size lessened little by little, when the Eudragit® FS started to break down at pH scale seven.4 shaping a gel-like layer round the grain the medication release got constrained by dispersion and disintegration. The medication release was found to diminish with grain size in view of the abatement surface region.

The medication release profile was discovered to be steady once one month stockpiling at 40°C/75% proportion and 60°C/without mugginess; as no alteration was found at each conditions contrasted with the underlying profile. The medication release was discovered to be raised with the medication stacking (10, twenty and half-hour separately) inside the main about six hours (at pH scale one.2 and pH 6.8), though bated at pH 7.4 and this was ascribed to the extra little pH scale climate inspired by 5-ASA broke up inside the granules. the release contemplates had conjointly indicated that the dissolve expelled granules showed a postponed and pHdependent 5-ASA release contrasted with the traditionally compacted granules. This was clarified by the higher consistency of the standard granules, which was affirmed abuse examining microscopy. Kumar et al. [7] explored the occasion of a multiparticulate oral detailing of mesalamine, covered with Eudragit S100, as a potential colon focused on conveyance framework. The medication was exemplified in gellan gum-beetle bean gum-sodium alginate globules by inotropic gelation technique.

A lower In vitro release was found for The Eudragit S100 covered details contrasted with the uncoated ones inside the essential 5 hours (at pH scale one.2 and pH 6.5). Gamma scintigraphic reads were performed for the upgraded definition in bunnies. The scintigraphic pictures found that the conveyance frameworks stayed flawless inside the midsection, next to no medication release had happened in the little gut and wide spreading of radiation had happened once the framework entered the colon. This wide alteration was credited to the corruption of gellan gum through the colonic microorganism. The in vivo investigations conjointly demonstrated that the detailing

span was more than twelve hours inside the colon. Patole et al.investigated the occasion of a consolidated pHmicrobial delicate conveyance framework upheld enteric covered hydroxypropyl methylcellulose cases packed with mesalamine-stacked alginate microspheres, which was prepared misuse partner emulsion crosslinking procedure.

The improved microspheres (on the reason of most capture effectiveness) were choose for exemplification and any examinations. totally various loads (10, twenty and thirty mg) Had been utilized partner enteric coat. The thirty mg coat definition was prepared to hinder mesalamine release in reenacted intestinal liquid for six hours, so it had been choose for testing in reproduced colonic liquid inside the presence of rodent colonic substance. The medication release was expanded fundamentally inside the presence of the colonic substance (around 92% free inside ten hours contrasted with sixty fifth inside the nonappearance of the colonic substance at indistinguishable time point). This had been clarified by the microorganism corruption ofalginate. In another comparable examination, Patil et al. [8] examined the arrangement mesalamine-stacked microspheres and completed that the reasonable incorporation of pH scale needy and independent polymers (Eudragit S-100 and Na alginate separately) was lucky to direct the medication release and achieve a colon set off conveyance.

Kar et al. [9] broadly used partner emulsification dissolvable dispersion technique to compose mesalamine microspheres, covered with 2-methylpropenoic corrosive copolymers, as a controlled conveyance framework for the expected treatment of provocative inward organ maladies. in vivo biodistribution of the streamlined microsphere definition was researched in the unpleasant individual of mice and contrasted and unadulterated 5-ASA goal. The improved plan showed a superior AUC0–t (around a couple of.6 times) in colon contrasted with the unadulterated medication goal. the absolute best mesalamine fixation was found inside the colon for the microsphere readiness once eight hours and insignificant amount found inside the various components of the upsetting individual.

In differentiation, the most elevated medication fixation was found inside the digestive system for the unadulterated medication goal once eight hours. Pawar et al. [10] built up a pulsatile controlled unharness framework, utilizing a pH-time subordinate methodology, to accomplish a colon-explicit controlled conveyance of mesalamine. during this work, they created Associate in Nursing enteric covered case, made out of a water dissolvable cap Associate in Nursingd an insoluble body, any place the medication definition (mesalamine covered with Eudragit L-100 and S-100 copolymers) stuffed inside the body and isolated from the cap by a gel plug. during this framework, the case enteric coat breaks up after arriving at digestive system and thusly the gel plug begins to expand during a period controlled way accounts the little enteric travel time.

At long last, the attachment launches and allows the plan conveyance to the colon, where the medication unharness is more controlled up to 24 hours by the pH-responsive coat. Parmar et al. created Associate in Nursing enteric covered bilayer (quick and continued unharness layers) tablets of mesalamine abuse HPMC K4M and HPMC K15M polymers for the supported unharness layer.The streamlined detailing was covered for different occasions (20, forty and sixty min) misuse Eudragit S-100. The In vitro unharness considers unconcealed that the hour covered definition was the sole one sure-fire in forestalling 5-ASA unharness inside the higher trench (stomach and small digestive tract).

This was added to the enough coat thickness accomplished for this definition. The in vivo unharness concentrates in bunnies had moreover affirmed this finding; as the plasma drug fixation was just discernible after vi long stretches of organization for the bilayer tablets and 0.5 hour for the standard quick unharness pill. The 0.5 lifetime of the created bilayer tablets was discovered to be twenty hours contrasted with one hour inside the quick unharness pill, that showed the continued 5-ASA discharge from the bilayer tablets. The roentogenographic pictures had moreover affirmed that the created bilayer tablet stayed unblemished inside the higher trench and required over four hours to accomplish the colon.

Diagram of the MMX mesalamine tablet. 5-ASA, 5-aminosalicylic acid. Reprinted with permission from Shire Pharmaceuticals Inc.
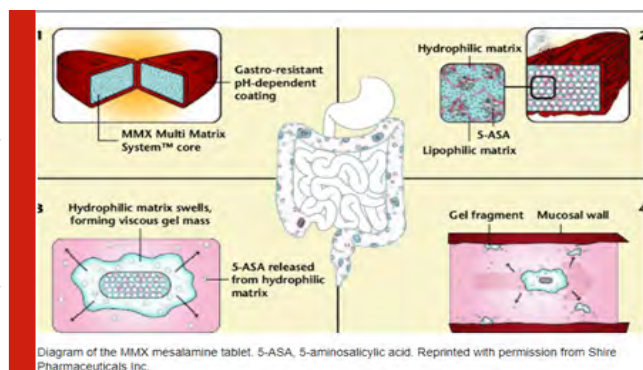
Enzyme sympathetic detain: Chemicals region unit organic impetuses that zone unit amazingly explicit and particular for their substrates. They assume a significant part in synthetic and organic cycles at spans the human cells. The ability to change state responses at low temperatures, in twofold compound conditions and at totally unique pH esteems, makes them suitable to be worried in drug conveyance and medication application frameworks [11]. The presence of explicit proteins, made by various anaerobic bacterium present inside the colon, as azoreductase, galactosidase, nitroreductase, glucoronidase and xylosidase, advocates the benefit of arranging quickening agent touchy frameworks for colon explicit medication conveyance . Jin et al. explored the occasion of pH–compound delicate microparticles, in view of mesalamine-stacked chitosan microparticles covered with methacrylic corrosive copolymers, as a chose conveyance framework for the treatment of incendiary inside sickness.

In vitro unharness tests were give out back to back in supports of pH one.2 (for a couple of hours), pH 7.4 (for three hours) and pH vi.8-with cavum content (for twenty hours). the release contemplates incontestable the capacity of the prepared particles to viably impede the medication unharness inside the recreated viscus and enteric cushions (the first five hours), and the executives the medication unharness at pH vi.8 within the sight of four-dimensional rodent cavum content. Around three-dimensional of the stacked mesalamine was released from the created microparticles contrasted with finish mesalamine unharness from the ordinary suspension at indistinguishable time purpose.Around 70th of the stacked mesalamine was released more than 20 hours inside the presence of the colonic substance. The pharmacokinetics contemplates found that a superior AUC0–t (around 72 µg•h/mL) and longer half-life (16 hours) was acquired for the created particles contrasted with the medication suspension (41 µg•h/mL and three hours individually). Those discoveries were affirmed inside the biodistribution examines; as a higher AUC0–t was found for the created particles in the colon contrasted with the medication suspension.

Just as, the most elevated medication focus was found inside the colon for the created particles though found inside the digestive tract for the suspension once eight hours of medication administration.Jaiswal et al. [12] utilized Associate in Nursing ionotropic gelation methodologyto plan twin crosslinked mesalamine microparticles, utilizing totally various proportions of chitosan and cellulose, as a potential catalyst delicate conveyance framework. Expanding and in vitro unharness examines were acted in recreated viscus (pH one.2), intestinal (pH vi.8) and colonic (pH seven.2) liquids. All definitions unconcealed low growing at pH one.2, higher expanding at pH 6.8 and more extraordinary expanding increment found at pH 7.2. The microparticles displayed a unimportant medication unharness during a couple of hours at pH one.2 contrasted with the upper pH esteems. A superior unharness was found at stretches three hours at pH 6.8 and an extra increment found at pH seven.2 all through eighteen hours.

More unharness considers were performed inside the presence of rodent cavum content, any place the whole debasement of the compound transporter by colonic proteins was found. Mesalamine has prior reputed to affect the parity of the colonic microflora [13], that goes about as an unharness trigger for sugar based generally frameworks. underneath these conditions, there is a possibility for the disappointment of the polysaccharidebased oral conveyance framework when giving the essential portion. Such disappointment has been previously reputed as a consequences of the upset microflora level [14]. To beat this drawback, Kaur et al. [15] built up a microbially set off mesalamine microshperes misuse regular polysaccharides (guar gum and thickener) and joined with probiotics in an exceedinglysingle portion type, any place gum and thickener go about as prebiotics. it completely was finished this created joined framework is unmistakably

prevalent contrasted and frameworks dependent on deferred drug unharness and misuse fake polymers as a pH touchy coat. Thakur et al. [16] additionally utilized the utilization of probiotics to give shower dried microparticles, comprise of mesalamine stacked eudragit S-100 inserted in probiotic biomass, as a consolidated focused on mitigating approach for the possible successful treatment of incendiary inside sickness.

The prepared detailing showed a controlled conveyance of mesalamine and incontestible the adaptability to scale back to scale back irritation and angle impacts identified with average treatment of provocative inside sickness. In another examination, Mohanta et al. [17] explored the co-organization of probiotics, with mesalamine (covered with gum and Eudragit S100) and shower dried changed apple polysaccharide minitablets, for the possible treatment of incendiary gut malady iatrogenic in rodents. The trial examines indicated that the most restorative effectivity was earned with the co-organization of the 2 arranged minitablets and probiotics contrasted with it, with the one organization of mesalamine minitablets, changed apple sugar minitablets or probiotics alone. Kandula et al. [18] blended CLX-103 as an exceptional prodrug form of mesalamine, omega-3 and soaked unsaturated fat, to achieve a colon focused on mesalamine conveyance with expanded security and helpful effectivity.

In vitro and in vivo investigations demonstrated that CLX-103 was biochemically steady in reproduced viscus liquid and went through impetus substance response inside the viscus setting to discharges mesalamine, that remained an all-inclusive measure of your time in the enormous gut contrasted with sulfasalazine. Cesar et al. [19] combined a compound prodrug of mesalamine, made out of chondroitin salt combined with mesalamine, as a potential colon focused on drug conveyance framework for the treatment of incendiary digestive tract sicknesses. The incorporated compound prodrug displayed a colon mucoadhesion sway as wanted, that makes it promising for focusing on mesalamine at the colon. Walz et al. [20] considered the impetus degradability of acetylated polyose, that was prepared as a potential exemplification material to achieve a colonic focused on conveyance of mesalamine. Anindya et al. [21] blended xylan-mesalamine form as a promising colon set off conveyance framework.

Xylan was disconnected from pineapple stem squander. The In vitro investigations demonstrated that prepared form was no-hit to hold mesalamine conveyance in reproduced higher GI liquid, while unharness it rapidly in reenacted colonic liquid with rodent substantial hole content. The in vivo examinations finished that the prepared plan showed a postponed mesalamine conveyance and lower bioavailability contrasted with free mesalamine, that makes it a good up-and-comer as a potential colon-explicit conveyance framework. In another investigation Souza et al. [22] reputed the no-hit improvement of mesalamine stacked microshperes, in view of xylan, abuse water-in-water emulsion method.

Ultrasound intercede Approach: A misrepresented consideration has been raised as of late toward the utilization of ultrasound at low recurrence (≤100 kHz), for the successful treatment of fiery digestive system illnesses, as a physical regard for encourage and quicken the medication conveyance technique additionally as increment tolerant consistence and acknowledgment; as a consequences of the blurred clyster dosing recurrence and required tissue layer presentation time [23, 24]. Ultrasound intervene GI conveyance approach was right off the bat reputed inside the mid-1980s by Kost and Langer in their application associated with transbuccal drug conveyance [25]. This methodology utilizes an intermittent recurrence ultrasound to trigger medication conveyance at lower someone or other by means of causing transient cavitation that produces microjets to improve drug penetration through channel tissue layer [26].

Schoellhammer et al. [27] supposed the occasion a hand-held gadget that utilization a periodic recurrence ultrasound, as a reversible and effortless technique to support mesalamine conveyance inside the treatment of injury colitis and Crohn' unwellness. This gadget was coadministered cursorily into the body part of geological locale pigs with a mesalamine clyster. it completely was discovered that a brief presentation was prepared to improve mesalamine conveyance multiple times contrasted with it with commonplace clyster treatment. In another examination, they researched the colonic conveyance of polymer particles in living mice and it was finished that ultrasound intervene approach has effectively expanded living thing conveyance of mRNAs and siRNAs to the mice colon [28].

CONCLUSION

Mesalamine might be a BCS class IV drug commonly utilized as an essential line mitigating drug specialist to treat fiery inside malady and Crohn's illnesses. The directly available medicines are not everlastingly viable and might cause genuine viewpoint impacts. The occasion of mesalamine colonic focused on conveyance has increased overstated regard for support the remedial effectivity and scale back potential angle effects.Several techniques are intended to create controlled conveyance frameworks of mesalamine, for example, time subordinate, pH responsive, enzymatic/microbial responsive and ultrasound intervene approaches. A joined deferred pH ward and quickening agent touchy medication conveyance framework upheld nanocarriers is planned as a promising oral conveyance framework to more expand the colon-particular conveyance of mesalamine in treating {ulcerative colitis|colitis|inflammatory inside unwellness} and Crohn' infection.

Such controlled medication conveyance framework will exhibit the adaptability to hinder the medication unharness at the higher channel (stomach and little digestive system) and convey 5-ASA, successfully and by determination, to the aggravation site; so diminishing angle impacts and dosing recurrence,

improving the restorative effectivity and staying away from drug debasement. The framework security, strategy effortlessness and wellbeing of materials used in manufacturing this procedure should act naturally tended to only; for the fruitful interpretation of such methodology into modern scale creation and clinical apply. the utilization of ultrasound intervene approach inside the rectally managed mesalamine is promising to incredibly improve the medication conveyance strategy and diminish issues identified with regular bowel purges conveyance, for example, understanding acknowledgment, dosing recurrence and required tissue layer introduction time.

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Integrating Ict in Teacher Education Programme – Status, Prospects and Challenges with Special Reference to Mizoram

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ABSTRACT

The use of information and communication technology (ICT) in education has revolutionized teacher education and use of innovative approaches in teaching methodology has changed teaching and learning process. Knowledge of ICT and skills to use ICT in teaching/ learning has gained enormous importance for today's teachers. Teachers are expected to know to successfully integrate ICT into their subject areas to make learning more meaningful. This knowledge development during teacher education programs has gained much importance with the notion that exposure to ICT during this time is helpful in increasing student teachers' willingness to integrate technology with classroom teaching. This paper focuses on issues relating to ICT integration as a core component in teacher education. The current status of ICT in teacher education institution in Mizoram have been reviewed. Prospects and challenges of ICT in teacher education have been highlighted and comments were given in line with Draft NEP 2019.

KEY WORDS: ICT, TEACHER EDUCATION, STUDENT TEACHERS, INTEGRATION.

INTRODUCTION

Recent developments of innovative technologies have provided new possibilities to teaching profession but at the same time have placed more demands on teachers to learn how to use these technologies in their teaching. Globally, educational systems are under great pressure to adopt innovative methodologies and to integrate new Information and Communication Technologies (NICTs) in the teaching and learning process, to prepare students with the knowledge and skills they need in the 21st century.

As per the report of Global Business Coalition for Education (GBC-Education), the Education Commission and UNICEF, more than half of South Asian Youths are not on track to have the education and skills necessary for employment in 2030. According to the data, South Asia lags behind several other regions in preparing the next generation of young people with the skills they will need for 21st century work. The projection worked out showed that India will produce 47% of young people not ready for the world of work which the industry will require by 2030. Apparently, teaching profession requires revamping of methods and approach to meet the challenges posed by new developments. There should be a shift from an emphasis on teacher-centered, lecture-based instructions to student-centered interactive learning environments.

The present paper is a report of the study taken up to find out the status, challenges and prospects of integrating ICT in the teacher education programme and information were collected from 3 (three) Teacher Education Institutions,i.e. Mizoram University, Institute of Advanced Studies in Education (IASE) and District Institute of Education and

Training DIETwhich are running Secondary Teacher Education Programme.

The following objectives were framed for the study:
1. To find out the status of ICT in teacher education in Mizoram.
2. To study the challenges faced byteacher education institutions in Mizoram.
3. To examine the prospects of integrating ICT in teacher Education programme in the light of draft NEP 2019

For collection of necessary data relating to objective number 1 & 2, interview with Teachers in charge of ICT in the select sample institutions was done. Draft NEP 2019 was the main source for examining the prospects of integrating ICT in teacher Education programme in the light of draft NEP 2019. The following were the findings –

Status of Ict in Teacher Education In Mizoram: The above table indicates that MZU is having 31 Computer sets, IASE 60 computer sets and DIET, Aizawl is having 50 computers. Regarding availability of Software/module there is a very limited number of software in all the institutions. Internet connectivity is available in all teacher training colleges, the students are having full access to it. Regarding the qualification of ICT teachers, they are all qualified teachers.All the institutions were running B.Ed course under Mizoram University which

offer one separate paper on ICT in Teacher Education in the Ist Semester.AdditionalComputer Courses like, CCC programme and Data Entry programme are offered both in DIET, Aizawl and IASE. The paper on ICT in Teacher Education offered has the following objectives -

1. Enabling he student-teachers to understand the social, economic, security and ethical issues associated with the use of ICT and identifying the policy concerns for ICT describe a computer system operate the Windows and/or Linux operating systems.
2. Enabling student teachers with the use of Word processing, Spread sheets and Presentation software.
3. Helping student teachers acquire the skill of maintaining the computer system and the skill of trouble shooting with the help of Anti-Virus and Other tools.
4. Acquainting students' teachers how to operate Internet with safety and elucidating the application of ICT for Teaching Learning, develop various skills to use computer technology for sharing the information and ideas through the Blogs and Chatting groups
5. Helping them to critically evaluate ICT related policies and plans
6. Making student teachers learn how to assess various problems and issues related to information and communication technologies and its integration in education.

Table 1. Facilities available in the Teacher Education Institutions					
Institutions	Computer Sets	Software	Internet Connectivity	Qualified Teacher	ICT Course
MZU	31 Computers	Limited software	Available	Yes	ICT in Teacher
IASE	60 Computers	Limited Software	Available	Yes	Education offered
DIET, Aizawl	50 Computers	Limited Software	Available	Yes	in IstSemester

Challenges In Using Ict In Teacher Education: Teachers have been polarized in their acceptance of the new technologies. While some teachers have enthusiastically integrated computers and the internet into the classroom, others have been cautious in their welcome and some have simply rejected the technologies.New role of teachers should be engineered accommodating the revolution ICT has brought in the field of teaching. From the responses of the teachers in charge/teaching ICT in the sample institutions, the main challenges they are facing is that in all the institutions unstable and slow speed of internrt connectivity in the campus. This creates problem for the students and the teachers as well. Thisisone of the reasons why the students lack interest in spending more time in the ICT laboratory.

Regarding computer sets, there were many computers which were not working and which were not repaired for a very long time and this create problems for the students as well as the teachers. Time allotted for activity

in the ICT course did not suffice the required time for the activity related to hardware. Regarding using of ICT in classroom teaching learning process mostly the senior teachers are facing problems in integrating ICT in their classroom teaching, on being ask the reason for this the responses given were that because of lack of confidence, lack of training, due to limited time for preparation of powerpoint at home and also due to lack of required resources.

Prospects of Integrating Ict in Teacher Education Programme in the Light of Draft Nep 2019.
Teacher preparation and continuous professional development: Most faculty members will require upgradation of their subject knowledge, which can just as well be done through online education. With regard to school teacher preparation through the four-year integrated B.Ed. programme, the considerations are similar to all undergraduate programmes. Online, open

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and distance education, can both be used, but extremely judiciously. Teachers will also need to be prepared to use education technology in classrooms.

Teacher preparation in the use of educational technology: To skill teachers at all levels in the use of educational technology, all teacher preparation programmes will include hands-on training in leveraging technology-based resources, including addressing common problems related to connectivity, maintenance of equipment and its safe operation, pedagogical strategies for utilising e-content (including conducting classes effectively in a flipped mode and leveraging MOOCs), and using appropriate tools to enhance teachinglearning processes (e.g. tools to assist CWSN and tools to help teachers reflect on their pedagogical styles by capturing classroom practices).

Use of educational technology for continuous teacher professional development: An online training platform - linked to appropriate mechanisms to certify trainees in specific areas - will be developed to empower in-service teachers at all levels of education to stay at the cutting edge of pedagogical techniques.

Specific technology related policy actions: The necessary interventions must include customised courses for faculty development programmes on a platform such as SWAYAM. Both for school teachers and for faculty in higher education, SWAYAM can cover the theoretical aspects of learning. At the same time, DIETs and and HRDCs will continue to provide academic support to school teachers and faculty in higher education, respectively.

Improving teaching, learning and evaluation processes: Availability of an adequate number of access devices (rapidly becoming smart phones or iPads and equivalents) and controlled access (for safety purposes) to the Internet can empower teachers as well as students to make use of these resources and even contribute to creating more. Integrating educational technology into the school curriculum: From age 6 onwards, computational thinking (the thought processes involved in formulating problems and solutions in ways that computers can effectively execute) will be integrated into the school curriculum. This is a fundamental skill in the digital age, and it can be effectively taught with well-designed paper worksheets.The school curriculum will promote digital literacy using these personal devices as well as available digital infrastructure (computer laboratories, tinkering laboratories, makerspaces, etc.). The school curriculum will offer optional subjects focused on programming and other advanced computer-based activities at the late upper primary and secondary stages.

Approach to the induction of technology: a positive yet cautious approach to the induction of technology at scale will be adopted, to ensure that the limited funds available and energies devoted to educational technology are deployed in an optimal manner.

Qualified support for educational technology with teachers playing a central role: Education technology is amongst the most powerful array of tools and methods that a teacher may potentially use in her/his work. Teachers will be completely empowered through adequate training and support to lead the activities and initiatives related to the use of appropriate technologies in classrooms, and for all other uses of technology in educational institutions.

Technology use and integration in educational settings: the focus will not just be on creating and delivering high quality content, but also on using technology to: support translation of content into multiple languages; assist differently-abled learners; improve the quality of pedagogy and learning processes through the use of intelligent tutoring systems and adaptive assessment systems; create new types of interactive and immersive content (e.g. using augmented and virtual reality); strengthen educational planning and management and bring greater transparency and efficiency to the examination system as well as to administrative and governance processes; assist in the management of education such as supporting teacher development programmes; and scale up the ODL system so that it can respond to the growing demand for education from all age groups, across school education, higher education, professional and vocational education, adult education, and lifelong learning.

Centres of Excellence in Educational Technology: Centres of Excellence in Educational Technology will be established at prominent Universities and other institutions to perform research as well as support functions for the uptake of appropriate technology solutions. These Centres of Excellence will be represented at the NETF and they will engage themselves in a two-way interaction with other members of the NETF for sharing of knowledge and knowhow.

General guidelines for technology-based interventions: Three main components will form an integral part of most technology-based interventions: hardware, software and data. In general, the following guidelines will be used. Exceptions to these guidelines, if any, will be carefully and publicly justified. As has already been said, the present system and methods of teaching seem to lack the required technology to prepare students for the demand of the 21st century and the projected picture shows a very grim figure.

The draft policy which is in relation to the use of technology in education, if implemented, will need a fresh approach to preparation of teachers. Most faculty members will require upgradation of their subject knowledge, which can just as well be done through online education. With regard to school teacher preparation through the four-year integrated B.Ed. programme, the considerations are similar to all undergraduate programmes. Online, open and distance education, can both be used, but extremely judiciously. Teachers will

also need to be prepared to use education technology in classrooms.

CONCLUSION

Rapid changes in technology will ensure that ICT will proliferate in the classroom. The latest ICT trends include internet, mobile learning, tele–learning and social networks. Anytime anywhere communication is happening and we must be prepared for the changes this will bring to our classrooms, as well as to our society in general. ICT require a modification of the role of teacher, who in addition to classroom teaching, will have other skills and responsibilities which will pave the way for quality education. Teachers are expected to become specialists in the use of distributed learning techniques, the design and development of shared working spaces and resources and be virtual guides for students who use electronic media.

ICT helps the teacher to appreciate and adopt emerging communication technology and innovative practices. It enables the teacher to update the new knowledge and skills to use the new digital tools and resources. Quality of education is improved through diversification of contents and methods, innovation and sharing information in education. Thus, every teacher must be prepared to have the skills of using ICT for teaching.

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Impact of Social Media Marketing on Consumer Buying Behavior with Special Reference to Jodhpur City

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ABSTRACT

Internet has brought revolutionary changes in our daily lives. It has changed the way we live, work and think. Social Media is playing important role in every aspect of society. Now marketing techniques has also changed and social media marketing techniques are being used by small as well as big companies. In this paper an attempt has been made to evaluate the impact of social media marketing on consumer buying behavior in Jodhpur city. 100 social media users response were recorded to know the clear picture. ANOVA and Correlation statistical tools used to analyze the impact. It can be helpful in further research in marketing by social media and its impact on consumer behavior.

KEY WORDS: MARKETING, SOCIAL MEDIA MARKETING, CONSUMER BUYING BEHAVIOR, MARKETING TECHNIQUES. INTERNET MARKETING.

INTRODUCTION

Internet based Marketing is significant and it is among the best instrument and method in the field of Marketing now a days. It is now realized that ihow idifferent showcasing apparatuses and methods can be expanded number iof selling articles is the principle point of each agent. Almost icertainly it can raise the benefit of a different organizations example. The primary point of this study is to inspect how social media marketing can influence the last buyer conduct among individual who for ithe imost part utilize ionline networking sites iand furthermore to discover the anticipated connections among different internet based life advertising exercises, customer exercises and conduct of the buyer.

Today, we are living in 21st century; it is extremely hard for the purchasers to invest energy in buying the item due ito busy schedule. Presently buyers are securing adherents and supporters giving data by internet based marketing howito buy the merchandise online without sitting around inactively to go actually. Through Social Networking Sites shoppers can get data about organizations as well ias for the products also. Indeed, even online networking is helping customers to purchase item through commitment that implies buyers and different partners like organization, buyers, society, specialists are members rather than watchers. So Consumers can adjust their perspective before buying any iitem through the web.

Social Media: It is inamed as the assortment of online correspondence of different data sources which might be inetwork based or singular, associations, intercommunications, substance sharing, sites and a lot more among various clients. While different internet based life masters characterize the iterm Social Media and their definitions on the different focuses. It's an on-line medium controlled by the net for social correspondence. It is a two-way correspondence medium. A imedium ithat grants creation and trade of data, a medium that iis bolstered by web innovation administrations.

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Today many social networking sites are found on web world. The most famous are Facebook, Youtube, Twitter, Whatsapp, Instagram etc. Around the globe millions of people spend their time on these sites. So it is a great opportunity for the business to promote their products and services through these channels.

Benefits of Social Media Marketing: There are many benefits one can have through social imedia imarketing:

Increased exposure: Smart phone has reached to the millions of people in the world. It has become the important part of everybody's life. So exposure is increasing.

Increased Traffic: Many researches have proven that traffic is increasing day by day on social networking sites. Day by day new potential consumers are increasing tremendously.

Develops Loyalty: Out of the imany social networking sites, people prefer according to their test. When ithey like particular site and develop the sense of loyalty then it also help for the trader to grab the buyer.

Reduced Marketing Expenditure: Social Media iMarketing is very cheap and user friendly.

Increased Brand Recognition: Social Media is also helping in brand recognition.

Review of literature: Some relevant literature reviewed to get the evidence and analysis regarding the issue. Pietro et al., (2012) investigate the reach out of web based life, especially Face book, impact purchasing choice. They discover joy in utilizing web based life for purchasing choice. The study uncovers about consumer's proposals and suggestions on stock on Face book, delight in finding the data on brands what's more, items, and mentality in the use of different apparatuses gave by online life for the purchasing choice of items. The examination additionally gathers a decent relationship between the perspectives on shopper towards purchasing aim of client and internet based life.

Dehghani et al., (2013) their investigation examinations the information legacy on customer's activity and notoriety of brand. Information legacy on the web based life happen once an individual watches conduct of others and settle on a comparable choice that other individuals have just made. The information course are frequently utilized for one among 2 consequences for customers, Knowledge falling makes the brand show up high or low in Customer Intention on buying and moreover may affect shoppers trust on brand. The investigation focuses on clients who have trust on brand picture. These sort of clients are affected by choice taken by others.

TeenaBagga et al., (2013) the examination investigations the internal and external variables of consumer's web based purchasing conduct. An organized structure was utilized and an overview was led with two hundred iexamples. Surveys were sent through the mail and furthermore posted through online pages and were replied by the respondents themselves. The measurable examination discovered seven main considerations that administer the consumer's purchasing conduct. These seven variables were: might want for Social Correspondence, site Attributes, on-line Advertising, Recreation, Accommodation, protection issues and information Search.

Balakrishnan et al., (2014) this examination finds the impact of online life towards brand picture and purchasing assessment of more youthful Generation. 200 polls were disseminated to college understudies of colleges in Malaysia. The reaction rate was 75 percent. 3 speculations and 2 suggestions were tried utilizing multivariate examination and mean. The outcome indicated that the web interchanges, online networks, electronic informal, and on-line exposure are fruitful in advancing the brand picture and purchasing goal of shoppers through web based life stages. These discoveries inform the chiefs to reach the more youthful age buyer web based life is the top of the line device. This examination gives data to worldwide venders in applying internet based life exercises to advertise their item.

Marta Zembik (2014) in his investigation clarifies that Social media contains web journals, open gatherings, online networking destinations, that is utilized for correspondence of some data. The information gave iin internet based life is gainful for association/firms and buyer. Buyer profited by the item data posted by others, proposals by different buyer. Firms profited by the data gave by the buyer in internet based life about their items, getting the criticism on their item advertise, data about the imminent buyer, buyer needs and segment attributes. This article accentuation on how online life data is fundamental for organizations and buyer in their dynamic procedure.

Prof. Assoc. Dr. Elenica Pjero et al., (2015) the specialists led the investigation in Albania reality segment. Their article directed on Social Media and its ability to impact purchasing conduct of client. The scientists talked about the development and flexibility of Social Media systems by various buyer on the planet. The scientists made a multifaceted investigation on the effect of Social Media on customers and purchasing aims. The examples are chosen from buyer of Social Media on the whole measurements and the outcome delineates the huge conduct of shoppers.

NimaBarhemmati et al., (2015) in their investigation found that Social Network Marketing is turning into the most effective model in publicizing. This investigation focuses on how Social Network Advertising impacts the customer purchasing conduct among shoppers who use person to person communication locales. The examination additionally breaks down the connections between client commitment, online life selling exercises and customer buy conduct. A study was led among

fifty iunderstudies of Malaysian National College. The outcomes demonstrated positive connections between purchaser commitments of internet based life and their purchasing practices.

Objectives of the study:
1. To analyze the impact of social media on consumer buying behavior in Jodhpur city.
2. To know the user's preference of social media platform while buying.
3. To give suggestions based on the study.

Social media and consumer buying behavior: Social Media Marketing is in trend now. Shoppers are searching for audits and suggestions. In this manner, it's fundamental to have an unmistakable online nearness on different internet based life stages. The most recent pattern in promoting is the presentation of the web based life. Online life has the ability to impact possible buyer from the beginning until the phase of a buy and past

also. Internet based life is a gigantic impact on customers when they are endeavoring to manufacture mindfulness about a specific item. At the point when individuals iface an issue, they begin looking for ian ianswer. Be that as it may, a large portion of the occasions individuals don't know which item or administration will tackle their issues.

Glad buyer will in general approach lauding the items with likes, offers, surveys and remarks via web-based networking media. Advertisers are making social space more straightforward by sharing surveys, remarks, likes, tweets and pins of their glad buyer to produce brand trust and increment transformation rate.

RESEARCH METHODOLOGY

100 samples of the people who use social media, took from across the Jodhpur city. Correlation and ANOVA statistical tools used to analyze the collected data.

Limitations
- Limited irespondents
- Just ione icity ihas ibeen itaken ifor ithe istudy

Scope of the Study: Social Media is playing important role in our lives. Now a days user base are increasing at all platforms. It's a great tool for marketing, so ithere is a big scope for further research to know more about the relationship of social media and consumer buying behavior.

Gender		Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	Male	48	47.5	48.0	48.0	
	Female	52	51.5	52.0	100.0	
	Total	100	99.0	100.0		
Missing	System	1	1.0			
Total		101	100.0			

Age		Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	18	1	1.0	1.0	1.0	
	19	1	1.0	1.0	2.0	
	20	5	5.0	5.0	7.0	
	21	2	2.0	2.0	9.0	
	22	8	7.9	8.0	17.0	
	23	8	7.9	8.0	25.0	
	24	10	9.9	10.0	35.0	
	25	19	18.8	19.0	54.0	
	26	18	17.8	18.0	72.0	
	27	8	7.9	8.0	80.0	
	28	7	6.9	7.0	87.0	
	29	5	5.0	5.0	92.0	
	30	3	3.0	3.0	95.0	
	31	2	2.0	2.0	97.0	
	32	3	3.0	3.0	100.0	
	Total	100	99.0	100.0		
Missing System		1	1.0			
Total		101	100.0			

Usages in one week (In hours)		Frequency	Percent	Valid Percent	Cumulative Percent	
Valid	3.50	3	3.0	3.0	3.0	
	7.00	17	16.8	17.0	20.0	
	10.50	2	2.0	2.0	22.0	
	14.00	18	17.8	18.0	40.0	
	17.50	7	6.9	7.0	47.0	
	21.00	18	17.8	18.0	65.0	
	24.50	7	6.9	7.0	72.0	
	28.00	9	8.9	9.0	81.0	
	31.50	2	2.0	2.0	83.0	
	35.00	6	5.9	6.0	89.0	
	38.50	3	3.0	3.0	92.0	
	42.00	5	5.0	5.0	97.0	
	45.50	1	1.0	1.0	98.0	
	49.00	2	2.0	2.0	100.0	
	Total	100	99.0	100.0		
Missing System		1	1.0			
Total		101	100.0			

RESULTS AND DISCUSSION

Ho: There is positive impact of social media on consumer buying behavior

H1: There is no positive impact of social media on consumer buying behavior.

We get the correlation value. 408 at 95% confidence level which states that there is a relation exists between

people who use social media and their buying behavior. Therefore we failed to reject the null hypothesis H0.

Ho: All social media types are equally preferred by consumers for buying decisions

H1: All social media types are not equally preferred by consumers for buying decisions.

		Descriptive Statistics				
			Bootstrap^a		95% Confidence Interval	
		Statistic	Bias	Std. Error	Lower	Upper
Socialmediausage	Mean	20.6850	-.0098	1.1694	18.3750	22.9250
	Std. Deviation	11.30135	-.06258	.73829	9.79933	12.60868
	N	100	0	0	100	100
bought anything in last 6 imonth	Mean	1.0600	.0069	.1335	.8003	1.3200
	Std. Deviation	1.34705	-.00327	.13365	1.06298	1.58908
	N	100	0	0	100	100

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Correlations

			Socialmediausage	bought anything in last 6 month
socialmediausage	Pearson Correlation		1	.408**
	Sig. (2-tailed)			.000
	N		100	100
	Bootstrap^c	Bias	0	.002
		Std. Error	0	.088
		95% Confidence Interval	Lower	1	.224
			Upper	1	.569
bought anything in last 6 month	Pearson Correlation		.408**	1
	Sig. (2-tailed)		.000	
	N		100	100
	Bootstrap^c	Bias	.002	0
		Std. Error	.088	0
		95% Confidence Interval	Lower	.224	1
			Upper	.569	1

In above Analysis of Variance, when we compare the different means. We get the F Value 1.431 which is less than the if table value(1.431) at 5% level iof isignificance, hence again failed to reject the null hypothesis. It means that all social media types are equally preferred by consumers for buying decisions.

	ANOVA				
social media	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	43.556	2	21.778	1.431	.310
Within Groups	91.333	6	15.222		
Total	134.889	8			

Findings and suggestions
- After analysis of data it has been found that there is a irelation between the users who use social media and their buying behavior in Jodhpur City.
- It has been noted that people from the Jodhpur who took part in the survey, also prefer the social media sites like Facebook, Instagram, and Whatsapp equally.
- Based on the study it can be suggested that there is relationship between the social media uses and consumer buying behavior, so social media marketing can be helpful in grabbing the new customers.
- Many top social media sites like facebook, whatsapp and instagram etc. are equally popular among the users, so any site can be used by the sellers but with the effective marketing techniques.

CONCLUSION

Social media, which includes the content, visuals, promotions, discounts and influencers, has the ability to influence the buying behavior of consumers. The effects of social media on consumer behavior cannot be ignored by brands and businesses. The study revealed that consumers who are influenced by social media are more likely to spend more on purchases. Moreover, the influence can be so high in some cases that more than

29% of consumers more likely to make a purchase on the same day of using social media.

Policy Implications: This study can be a roadmap for the new research in Jodhpur or another city in the field of marketing by social media and its impact on consumer behavior.

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Trends in Agricultural Exports of India

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ABSTRACT

The production of agricultural sector has been increasing after green revolution, hence, the agriculture sector made India as the seventh largest agriculture product exporter. Basmathi Rice and Non-Basmathi Rice, Meat, Goundnut, Milk, Sugar Cane and Wheat are the major crops yielding and are the highest outputs and India's exports. The agricultural sector has been playing a key role in the composition of Indian exports but, unfortunately the share of Indian agriculture exports have been slowly declining in recent years. The changing scenario of Global agricultural trade in the post liberalization era is as much challenging for India. Thus India could not gain much from trade liberalization even though the increasing rate of economic integration of the Indian economy with global processes. With this background, the present paper is confined to study the trends in Agriculture-Export of India in terms of export quantity, export growth rate, export per cent in GDP and the impact of exports on the growth of GDP after the post liberalization period (1990-91 to 2019-20) i.e., thirty years in three sub decades in a comparative analysis.

KEY WORDS: AGRICULTURE EXPORTS, POST-LIBERALIZATION, MAJOR CROPS, GROWTH RATE, PER CENT IN GDP, IMPACT ON GDP.

INTRODUCTION

Agriculture sector plays a significant role in the Indian economy. This sector made India as self-sufficient in grain production. It has a major contribution in geographical area and occupation. And it is the largest contributor of India's GDP even after a decline in the agriculture share in India. Agriculture is the primary source of livelihood for about 58 per cent of India's population. The Indian food industry is poised for huge growth; it is increasing its contribution to the world food trade every year. The Indian food and grocery market is the world's sixth largest market with retail contributing 70 per cent of the sales, the Indian food processing industry accounts for 32 per cent of the country's total food market, one of the largest industries in India and is ranked fifth in terms of production, consumption, export and expected growth. The some of the milestones of Indian Agriculture sector are: during 2017-18* crop year, food grain production is estimated at record 284.83 million tonnes.

In 2018-19, Government of India is targeting food grain production of 285.2 million tonnes. Milk production was estimated at 165.4 million tonnes during FY17, while meat production was 7.4 million tonnes. India is the second largest fruit producer in the world. Production of horticulture crops is estimated at record 314.7 million tonnes (mt) in 2018-19 as per third advance estimates. Total agricultural exports from India grew at a CAGR of 16.45 per cent over FY10-18 to reach US$ 38.21 billion in FY18. In FY2019 agriculture exports were US$ 38.54 billion. India is also the largest producer, consumer and exporter of spices and spice products. Spice exports from India reached US$ 3.1 billion in 2017-18. Tea exports from India reached a 36 year high of 240.68 million kgs in CY 2017 while coffee exports reached record 395,000 tonnes in 2017-18. Food & Grocery retail market in India was worth US$ 380 billion in 2017.

Government of India Initiatives for the development of Agriculture sector: Some of the recent major government initiatives in the sector are the Prime Minister of India, launched the Pradhan Mantri Kisan Samman Nidhi Yojana (PM-Kisan on February 24, 2019 and the Transport and Marketing Assistance (TMA) scheme to provide financial assistance for transport and marketing of agriculture products in order to boost agriculture exports. The Agriculture Export Policy, 2018 was approved by Government of India in December 2018.

This new policy aims to increase India's agricultural exports to US$ 60 billion by 2022 and US$ 100 billion in the next few years with a stable trade policy regime. The Government is planning to triple the capacity of food processing sector in India from the current 10 per cent of agriculture produce and has also committed Rs 6,000 crore (US$ 936.38 billion) as investments for mega food parks in the country, as a part of the Scheme for Agro-Marine Processing and Development of Agro-Processing Clusters (SAMPADA). And the Government has also allowed 100 per cent FDI in marketing of food products and in food product e-commerce under the automatic route.

Objectives and Methodology of the Study: The main objectives of the present study are to analyse the trends in India's agriculture exports in the post-liberalization period through the estimation of growth rates and to observe the impact of agriculture exports on the GDP of India. The objectives are as follows:

Product	Major Market	Product	Major Market	Product	Major Market
Floriculture	USA, Japan, UK, Netherlands & Germany	Mango Pulp	Saudi Arabia, Netherlands, UAE, Yemen, Arab Republic & Kuwait	Guar Gum	USA, China, Germany, Italy & Netherlands
Fruits & Vegetable Seeds	Pakistan, Bangladesh, USA, Japan & Netherlands	Pickles & Chutneys	Russia, USA, Belgium, Netherlands & France	Jaggery & Confectionery	Portugal, USA, Bangladesh, Pakistan & Nepal
Fresh Onions	Bangladesh, Malaysia, Sri Lanka, UAE, Pakistan & Nepal	Other Processed Fruits	USA, Netherlands, UK, UAE & Saudi Arabia	Cocoa Products	Nepal, Netherlands, Malaysia, Yemen Arab Republic & UAE
Other Fresh Vegetables	UAE, Bangladesh, Pakistan, Nepal &Sri Lanka	Buffalo Meat	Malaysia, Philippines, Saudi Arabia, Jordan & Angola	Cereal Preparations	USA, UK, Nepal, Sri Lanka & UAE
Walnuts	Spain, Egypt, Germany, UK & Netherlands	Sheep / Goat Meat	Saudi Arabia, UAE, Qatar, Oman & Kuwait	Alcoholic Beverages	Jamaica, Thailand, UAE, Angola & Bhutan
Fresh Mangoes	UAE, Bangladesh, UK, Saudi Arabia & Nepal	Poultry Products	UAE, Kuwait, Oman, Germany & Japan	Miscellaneous Preparations	UAE, Iran, USA, UK & Indonesia
Fresh Grapes	Netherlands, UK, UAE, Bangladesh, Belgium	Dairy Products	Bangladesh, Algeria, UAE, Yemen, Arab Republic & Egypt	Milled Products	USA, UK, Indonesia, Maldives & UAE
Other Fresh Fruits	Bangladesh, UAE, Netherlands, Nepal, Saudi Arabia	Animal Casings	Germany, Portugal, France, Spain & Italy	Basmati Rice	Saudi Arabia, Kuwait, UK,UAE & Yemen Arab Rep.
Dried & Preserved Vegetables	Russia, France, USA, Germany & Spain	Processed Meat	Seychelles, UAE, Hong Kong, Germany & USA	Non Basmati Rice	Nigeria, Bangladesh, South Africa, UAE & Ivory Coast

1. To study the trends in India's agriculture exports in terms of quantity and volume.
2. To ascertain the per cent of share of agriculture exports in GDP.
3. To examine the impact of agriculture exports on the GDP of India.

To see the trends in agriculture exports period in terms of quantity and volume in three sub decades of in the post-liberalization period, the annual growth rate, average annual growth rate and compounded annual growth rates are calculated. In order to calculate the growth rates of exports quantity the following formulas are applied:

- Growth rate = (Ending Value - Beginning Value) / Beginning Value]
- AAGR = (Growth Rate in Period A + Growth Rate in Period B + Growth Rate in Period C + ...Growth Rate in Period X) / Number of Periods
- CAGR = (End Value/Start Value)^(1/Years)-1.

And to calculate the impact of agriculture exports on the GDP of India the following simple linear regression equation is adopted.

• Regression: Y=a+bX

Research Hypothesis:
1. Ho1: There is no positive and significant growth in agriculture export quantity during the three sub decades of the post liberalization period.
2. Ho2: Exports of agriculture sector has no positive impact on the GDP of India in three sub decades of the post liberalization period.

Research Design: The present research study adopts the analytical research design technique which uses empirical evidence to examine the variation and relationship within and between the variables.

Sources of Data: The data examined were national aggregates that were collected from secondary sources. The major sources include agriculture and processed food products export development authority (APEDA) exports statistics, Ministry of statistics, National bureau of statistics, the CEIC data and other online information.

Method of data Analysis: The method of analysis of the study was used the Microsoft excel to find out the growth rates and econometric software eviews10 to estimate regression analysis.

Model Specification: The impact of Agriculture exports on the domestic economy was examined by the following simple linear regression equation:

$$Y=a+bX$$

Where Y = Dependent variable (GDP of India)
a = Intercept
b = Slope
X = Explanatory variable

In the above said equation the parameters give the information furnished below.

Coefficient of determination (R2): It determines the proportion of variation in the dependent variable as a result of the variation in the independent variable.

T – Statistic: This is the ratio of the departure of an estimated parameter from its national value and its standard error. It is used for hypothesis testing.

F – Statistic: It is applied to test the overall significance of the regression equation.

Exporting Commodities: The entire data of the study was based on the following agriculture commodity exports of India to all countries in the world in three annual decades. These commodities are: Basmati Rice, Buffalo Meat, Fresh Onions, Guargum, Processed Vegetables, Alcoholic Beverages, Fresh, Mangoes, Sheep/Goat Meat, Wheat, Mango Pulp, Groundnuts, Jaggery & Confectionery, Cereal Preparations, Pulses, Walnuts, Non Basmati Rice, Processed Fruits, Juices & Nuts, Other Fresh Fruits, Fresh Grapes ,Fruits &, Vegetables Seeds, Floriculture, Animal Casings, Other Fresh Vegetables, Miscellaneous Preparations, Cocoa, Products, Other Cereals, Dairy Products, Poultry Products, Processed Meat, Milled Products, Natural Honey, Cucumber and Gherkins(Prepd. & Presvd).

Trends in Agriculture Exports of India after the post–liberalization period: The present study analyses the agriculture sector exports in terms of quantity, volume, its per cent and the impact on the GDP of India after the post liberalization period in three comparative decades i.e., three phase periods 1) Phase I (1990-91 to 1999-2000) 2) Phase II (2001-02 to 2009-10) and 3) Phase III (2010-11 to 2019-20 (E).

Table: 3.1

Time Period	Average Exports Quantity (Billion Tones)	Average Growth Rate(%)
Phase I (1990-91 to 1999-2000)	62411.13	0.76
Phase II (2001-02 to 2009-10)	10840.63	0.15
Phase III (2010-11 to 2019-20)	22489.51	0.08

Figure: 3.1
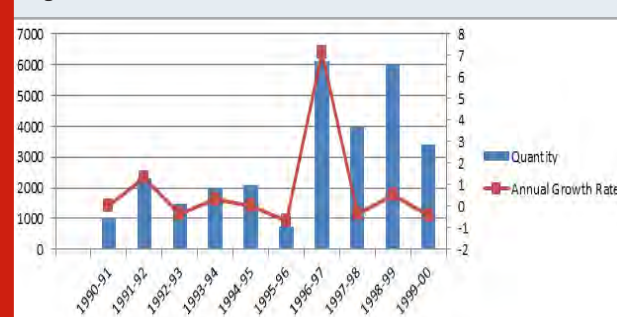
Table 3.1 shows the quantity of agriculture exports and their annual growth rates of three decades after post liberalization period. The quantity of exports is fluctuated in every sub decade. It is observed that the quantity of exports is declined first in the year 1992-93 after post liberalization period (Figure: 3.1), it showed that

the annual growth rate is in a negative value as -0.35. Thereafter it had declined in the years 1995-96, 1997-98 and 1999-2000. The stable growth in the agriculture production during the years 1990-91 and 1992-93 as 9,045 million tonnes in 1990-91 and 9736 million tonnes in 1992-93 may cause of the negative value of the exports in the year 1992-93.

As usual it had happened in the years 1995-96., 1997-98 and 1999-2000. In the next sub decade during 2000-01 to 2009-10 the export quantities are negative in the year 2005-06 and declined continuously in two years 2008-09 and 2009-10 (Figure: 3.2). In this phase the growth in the exports are very slow because the increase in the production is very constant in nature as 14,705 (mt) in 2000-01, 14,628 (mt) in 2001-02, 15,405 (mt) in 2004-05 and recorded continuously year after year 15575 (mt), 16095(mt), 14707 (mt), 14334 (mt) up to 2009-10 – 16,221(mt) are calculated.

In the last decade 2010-11 to 2019-20 (E) (Figure: 3.3) the agriculture sector showed a very low growth rate rate with a declining export quantities since 2013-14 to 2015-16 continuously because there was no record growth rate in the production of agriculture sector as it has accounted as 216378 (mt) in 2010-11, 16363 (mt) in 2011-12, 15735 (mt) in 2012-13 and 16092 million tonnes in the year 2013-14 and 2019-20 (E). Hence, the hypothesis (HO1) is partially rejected.
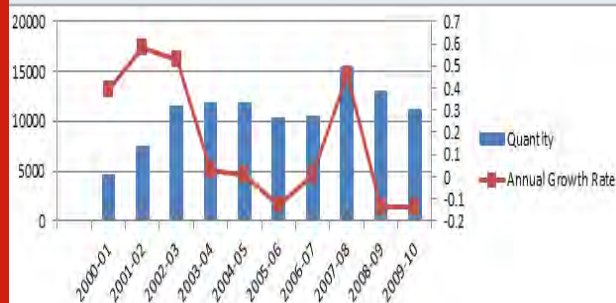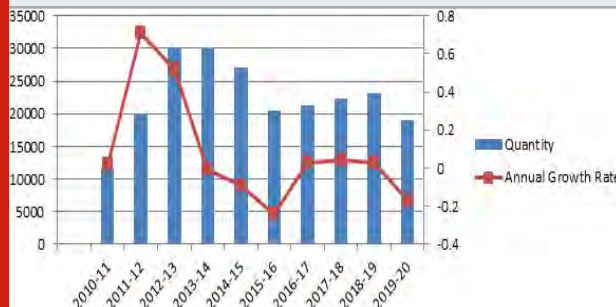
Table: 3.2

PERIOD	AAGR (%)	CAGR (%)
Phase I (1990-91 to 1999-2000)	0.12	0.13
Phase II (2001-02 to 2009-10)	0.08	0.09
Phase III (2010-11 to 2019-20)	0.05	0.05

Growth Rates of Agriculture Export

The above table reveals the information about the AAGR and CAGR of the three phases. In the first phase the AAGR is recorded as 0.12 and it has declined in the next phase to 0.08 and 0.05 in the last phase. The CAGR has also shown the same information of the declining rate of the growth of export quantity from first decade to last decade as it is decreased from 0.13 to 0.09 and to 0.05.

Table: 3.3

Descriptive Statistics	Export Quantity (US$ Bn) 1990-91 to 1999-2000	Export Quantity (US$ Bn) 2001-02 to 20009-2010	Export Quantity (US$ Bn) 2010-11 to t2019-2020
Mean	62411.13	10840.63	22489.51
Median	2190.555	11394.29	21787.04
Minimum	601019.0	15428.40	30172.96
Maximum	189254.2	2946.870	5588.542
Std. Dev.	2.66312	-0.700536	-0.264299
Skewness	8.11004	3.256531	2.730149
Kurtosis	22.72875	0.845337	0.146764
Jarque – Bera	0.000012	0.655296	0.929246
Probability	624111.3	108406.3	224895.1
Sum	3.22E+11	78156396	2.81E+08
Sum Sq. Dev.	10	10	10
Observations			

Figure: 3.2

Figure: 3.3

Table: 4.1

TTIME	Average Export Volume (US$ Bn)	Average Per Cent in GDP
Phase I (1990-91 to 1999-2000)	1.40	0.358
Phase II (2001-02 to 2009-10)	4.48	0.449
Phase III (2010-11 to 2019-20)	16.53	0.624

Descriptive Statistics:

The descriptive statistics of three decades is explained in the above table (Table: 3.3), it is observed that the mean of the agriculture exports in the first decade was 62411.13 billion tonnes (bt), in the second decade it was 10840.63 (bt) and in last decade it is 22489.51 (bt). It gives the information as the agriculture export quantities are much higher in the first decade but declined in the next decade but shown the slight increase in the last decade. The standard deviation of the variable in the first decade is 1892.2, in the second decade 2946.870 and in the last decade 5588.542.

Figure: 4.2
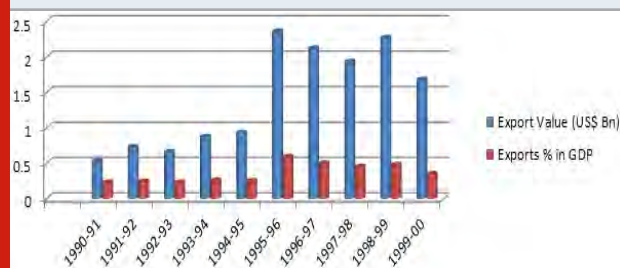
Figure: 4.1
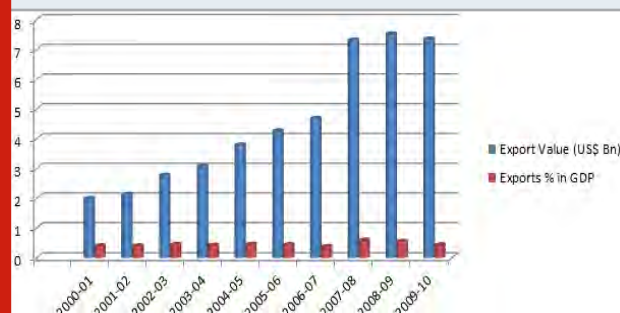
Figure: 4.3

Table: 5.1

Variable		Phase: I (1990-91 to 1999-2000)	Phase: II (2000-01 to 2009-2010)	Phase: III (2010-11 to –2019-20)
C	Coefficient	248.6632	192.1864	2242.630
	Std. Error	28.65523	117.4504	877.2397
	t-Statistic	8.677760	1.63619	2.556462
	Prob.	0.0000	0.1404	0.0338
Export Value (US$ Bn) (Independent Variable)	Coefficient	89.52188	172.8486	6.165572
	Std. Error	18.25677	23.77628	47.70796
	t-Statistic	4.903489	7.269792	0.129236
	Prob.	0.0012	0.0001	0.9004
R²		0.750345	0.868529	0.002083
Adjusted R²		0.719138	0.852095	-0.122656
S.E of regression		40.04339	155.3415	546.0179
F-Statistic		24.04420	52.84988	0.016702
Prob (F-Statistic)		0.001189	0.000086	0.900361
D-W Stat.		1.340830	2.181753	0.154

Agriculture Export Volume and Per Cent share in GDP:

The above table reveals the information about the volume of agriculture exports in US$ Billion and its per cent in GDP of India in three sub decades. In phase I the average export volume is 1.40 US$ Billion. It has increased in the next decade as to 4.48 US$ Billion and continuously recorded as 16.53 US$ Billion in the last phase of the decade. It had also shown the per cent of agriculture export to GDP in three phases as 0.358, 0.449 and 0.624 continuously at increasing scenario. The three figures (4.1,4.2,4.3) given below indicate that the per

cent share of agriculture export in the GDP of India. It is observed that it has increased in the first decade, showed a constant increase in the second decade the decreasing nature in the third decade.

The impact of Agriculture Exports on the GDP of India:

Table: 5.1
Dependent variable: GDP (US$ Bn)
Method Least Squares
Observations: 10 in each phase.

The agriculture exports of India are showing a positive and significant impact on the GDP of India in three decades after post liberalization period. The regression analysis of least squares is showing the impact with results. It is observed that the result of the regression analysis reject the null hypothesis HO2 in the first two phases i.e., the P- value is low (<0.05) (Table: 4.2) but in the last phase is was accepted the null hypothesis as the impact of agriculture exports have no significance as the P- values is > 0.05. It is indicated that the change in agriculture exports lead to change in the GDP of India in the first two phases but not lead much change in the last decade.

It is also proved with the value of coefficient, the coefficient of determination (R2) indicate that if there is a 1 per cent change in the agriculture exports lead to change 89 per cent increase in the GDP. It is evident that the 1 US$ agriculture export value lead to increase 89 US$ change in GDP in phase I. It is continued as in the second phase the impact had led to increase as to 172 US$. But in the last phase the impact is deceased in drastic value to 6 US$ in GDP. The F- Statistic value is explaining about THE overall significance of regression equation as the impact of the agriculture exports on the growth of the GDP is 24.04420 in the first phase, 52.84988 in the second phase and 0.016702 in the last stage. Hence, the hypothesis (HO2)is partially rejected.

CONCLUSION

The agriculture sector of India had been playing a pivotal role in the Indian economy. The agriculture sector exports have shown different accounts after the post liberalization period. The entire study has focused on the entire changing scenario of agriculture exports during the post reforms era in three sub decades, in the view of export quantities and growth rates, per cent share in GDP and the impact on the growth of GDP. The statistical results of all study variables have proved

the different changes relations in three decades. First of all the average quantity of exports have fluctuated drastically in three sub decades, but when looking in the growth rates the first decade has shown the high growth rate in the quantity of exports, but declined in the next decade in a large per cent and stated to increase in the last decade.

It observed that the volume of the export has shown continues increase in three sub decades and it per cent share in the GDP of India has also increased in study phases. It may cause by the volume of Rupee to Dollar exchange rate. At last the impact of agriculture exports on the GDP of India is different in three sub decades as it is high in the first decade, decreased in the second decade but negative in the third decade. Anyhow the entire study has given information about the role of agriculture exports in Indian economy after the post reforms period. However the agriculture sector given the most priory in the economy the agriculture export sector facing many hurdles as weakness in export infrastructure like storage, port handling facilities lack of technology, fluctuations in domestic and international prices, currency exchange rates etc.,

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The Development of Language Policy and its Implementations: the Case of Ethiopia Since 1991

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ABSTRACT

Ethiopia is a country in the north-eastern part of Africa and is exceedingly ethnically and semantically various, with more than 80 different languages spoken in its region. Over the span of its long history, Ethiopia has treated distinctive social and cultural issues inside the region. One of the essential issues that worry Ethiopia today is the subject of language. Amharic has kept up the predominance in governmental issues, business and social communication in the historical backdrop of language arrangement in the country. Ethiopia, in the distinctive routines, all the more explicitly until Ethiopian People's Revolutionary Democratic Front (EPRDF), had been predominantly Unitarian that favored Amharic as a national language. Amharic had been viewed as a language of national image and solidarity: primary education, common administrations and social orders, exchange and business and so on all utilized Amharic as a medium of instruction, cooperation, exchange and communication. For intellectual quest of inquiry to discover how human language and power, right are interrelated, it is palatable to raise assorted sociolinguistic aspects that may help people explain such relationship in a flamboyant way. In the midst of the propositions which have got a remarkable attention, nowadays, is language policy, language planning and the practical implementations. The paper is a comprehensive attempt to unpack language policy of the Democratic Republic of Ethiopia (EPRDF) since Post Mengistu Haile-Mariam's Regime. The paper thus focuses on the advancement of language policy and its implementations in Ethiopia 1991 until the present day.

KEY WORDS: ETHIOPIA, LANGUAGES, LANGUAGE POLICY, AMHARIC.

INTRODUCTION

Ethiopia is one of the countries which are different from the rest of African nations in that it was ruled and colonized by any external power with the exception of a multiyear attack from 1936 to 1941 by Italy and with the fable of the Queen of Sheba. According to Wagaw (1979), Ethiopia "may have had its root in the early time of Sabean movement to Africa". This movement had

made the country unique in its features. Not only these, Negash (1996) added, Ethiopia is one of only a handful couple of nations in the world having amazing history and with its claim contents sofar effectively being used. Alemu D. S and Tekleselassie, A. A. (2006) states that the nation's present instructive status, in any case, is remarkably frustrating Africa in regular base.

Ethiopia has also been named having a long history of 3000 years and then some. At different occasions, its ruling classes had assumed their jobs in molding the geological, social, authentic, and religious and so on - all parts of the nation. Thus the vast majority of the norm today is, as it were, the inheritance of our previous history. Our stresses and difficulties are what to do with the pervious.

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Ethiopia has treated differing social and social cases in its domain. One of the basic issues that stress Ethiopia today is the theme of language. Being a multilingual and multicultural country, Ethiopia shares the issue of language use and language decision for different purposes. There are more than eighty tongues in Ethiopia that can be incorporated under various language families (like Omotic, Nilotic, Semittic, and Cushittic). All these isolated dialects are taken as resources for the speakers of that language. Each language is utilized as a method for relationship for the framework that dialogs it. Close to the use of these dialects for correspondence purposes, they can be utilized in guidance, various leveled association and the esteem course of action of the nation.

What do we mean by a language policy?: The idea of language policy is fundamentally identified with choices standards, guidelines and rules, areas as well as domains of dialect which is the privileges of that language speakers' inquiry. According to Calvet (1998), they will regard language approach as the cognizant decision made in the space of connection among language and public activity all in all. There is moreover a dynamically express the case in a predominant significance. This particular concept lights up language approach and its dialects as:

I. The government is expected to acting out, to decide in legal ground, formal action, official activities or different intends as to:

1. identify in what ways are language utilized in open settings
2. develop language aptitudes expected to national needs, or
3. set up the privileges of people or gatherings to look after dialects.

II. Ruler guideline of the dialect incorporate ventures as to encourage comprehensible correspondence, enlist work force, ensure fair treatment, cultivate political cooperation, and give access to open administrations, procedures and archives.

The clarifications gave so far obviously call attention to that language strategy is the duty of the legislature. Researchers declare state that there is a requirement for the ownership of specialist in the definition of language policy (Columas,1994 and Calvet, 1998). Another concept illuminated by the space of usage of dialectic approaches and is stressed over choosing tongues which recommends as vernaculars must be utilized by languages of the nation, and increasingly broad correspondence, and others are picked by officials systematically. Language approaches are stressed over spaces use, and areas of vernaculars furthermore recommend what language should be used in preparing, instruction, association, etc, and to what degree and where should be settled by language courses of action.

Policies of language and its kinds: Arrangements of language change from spot to put and once in a while according to the political presentation of governments and the possibility of the overall population that exists. A few governments have open as well as unequivocal dialect methodologies, named as plain approaches, having made help in definitive files, for instance, and the constitution. Another one need to disguise to their language policy, and thus, don't express their language strategies in composed authoritative reports or others. Such approaches are alluded to as secretive language strategies. Undercover language approaches are otherwise called accepted, customary law or conventional, and for the most part it is the semantic the norm that is taken as the true or regular low.

According to Getachew & Derib (2006), language policies are likewise delegated either promotive or resilience (tolerant) contingent upon the help and consolation in a given legislature, utilization and advancement of the dialects. By spaces of utilization, it implies if (a) language (s) ought to be utilized in decision making places, learning centers or/and in the organization, and so on. Resilience approaches, then again, permit the utilization of a specific or a few dialects however without consolation of utilization and advancement by giving budgetary or faculty support. Another qualification is among language approaches is among equalitarian and confined approaches. Few language approaches treat 'regardless of whether a little minority' as in every case absolutely equivalents to any language and spot all dialects on equivalent footings. In any case, confined strategies as they infer, are not as open as equivalent for all languages.

According to Sengupta (2009), he first focused on the four modalities of language strategy, in light of the use of language (s) in that specific network. They are disconnection or separation: the types keeps up which ought to be no formally perceived language (s). The second one is official multilingualism: it ought to be a similar acknowledgment for the different dialects consumed in the network. The third is language defense: that is a special open language by restricting or precluding acknowledgment from claiming different dialects in specific circles of language utilization. And the last is language support: that intends to do the whole dialects similarly fruitful in the utilization. The above mentioned distinctive kinds of language policies, as expressed prior, are the indications the administration's philosophies in a certain nation for the discourse network in regards to on the language (s) use.

Language Policy of Ethiopian People Revolutionary Democratic Front (EPRDF): The new constitution of the Federal Democratic Republic of Ethiopia allowed every single ethnic gathering the privilege to build up their languages and to set up mother tongue primary education frameworks. This is a stamped change to the language strategies of past governments in Ethiopia. Properly, Ethiopia (1991), the Transitional Period contract in its second article has started the momentous ideological move by expressing the accompanying: Nations, Nationalities and people groups reserve the

option to self-assurance. As needs be every country, nationality and individuals has the option to safeguard and watch its personality, build up its way of life. The ensuing geopolitical reorganization, that presented the government arrangement of organization and the confirmation of the 1994 constitution, has likewise continued changing the historical backdrop of the nation with respect to language approach by representing the accompanying explanations in the constitution's Article 5:

a. Every single Ethiopian language will appreciate equivalent condition of acknowledgment.
b. In the federal, official language will be Amharic
c. Individuals from the representative may decide on specific dialects.

In such manner the present government has advanced the decentralized utilization of neighborhood languages for official, managerial, legal executive and instructive purposes. The present government has clarified that it progresses in the direction of the improvement of the whole Ethiopian languages for different aims. The social arrangement of Ethiopia as expressed in the reality in the accompanying manner that get equivalent acknowledgment, regard and opportunity to improvement, providing a conducive environment in order to conduct findings of the languages in scientific manners, and providing the essential expert help to the different countries, nationalities and people groups while settling on their decision of language (Ministr of Youth, Sports and Culture, 2003). The selection of languages so as to utilize in different places is by all accounts settled, yet there is a need to pick languages for mode of guidance, organization and equity at different dimensions in various pieces of the nation.

Language Use in Education: Maybe, the most grounded appearance of the strategies is found teaching learning processes of the nation other than in different areas. The Education and Training Policy (2002) peruses: "Conscious of the academic favorable position of the child in learning in first language and the privileges of nationalities to advance the utilization of their languages, primary education will be given in nationality languages". The legislature firmly contends that individuals ought to attend in their mother tongue in light of the fact that,

1. Language is the reason for personality
2. Academically it is increasingly favorable
3. It gives individuals mental fulfillment and causes them create positive confidence.

Because of this arrangement, there are 21 languages, barring Amharic, which are at present utilized as medium of instruction in primary cycle. Some of them are Konta, Nuer, Dawro, SidamuAfo, Gedeo, Wolayta, Xahmta, Afan Oromo, Gamonso, Goffa, Kambata, Silti, Kafinoono, Tigrinya Hadiyyisa. Every one of these languages is additionally given as independent subjects in the essential training. Notwithstanding the first cycle

level, Tigrinya, Oromefa, and Amhargna have been educated as subjects up to graduate and postgraduate level. A few languages including SidamuAfo, Gamo, Tigrinya, Wolayta, Kafinoono, Afan Oromo, Hdiyyisa and so on, are utilized to prepare elementary school teachers (Getachew & Derib, 2006).

Reasonable of Language Use in Education: Education is a basic reason for improvement. In spite of the fact that there are people who can think in a L2 the vast majority think in the language of their mother language. Along these lines, child must be instructed in their own first language if the learning and encouraging procedure is to be intelligent and productive. Access for education can likewise be evenhandedly conceivable if citizens are educated in their very own native languages. A native language implies the language one uses legitimately. This is due to the degree conceivable, all individuals should be educated in their native language at the grade school level, and even past, are as per the following:

i. Language isn't just a mechanism of guidance for the general population, yet additionally a seal of personality;
ii. Learning in a first language empowers the students' to comprehend exercises effectively, and dodges issues related with language hindrances;
iii. Using a language for guidance empowers;
iv. Using native language fortifies character and empowers its clients to be glad for their way of life and character.

They become fearless and pleased residents. Such self-assurance combined with the securing of information and ability through tutoring makes produce fit and profitable residents conceivable (MoE, 2002). In any case, because of restrictions of asset and lacking earlier arrangement, youngsters in certain regions need to learn in the language of the greater part as opposed to their very own first language. The strategy pinpoints the issues by accommodating the utilization of native languages or mother tongue in elementary schools and it clarifies this plainly in the archive of (MoE, 2002) Article 3.5.1 and 3.5.2. as pursues:

Insightful of the academic favorable position of the youngster in learning in native language and the privileges of nationalities to advance the utilization of their languages, primary education will be given in nationality languages. Making the essential readiness, countries and nationalities can either learn in their very own language or can look over among those chose based on national and countrywide circulation. According to MoE (2002), recently addressed educational programs wound up operational, more than 20 languages have been utilized as modes of guidance for up to grade 4, 6, or 8 relying upon the genuine conditions in every area. The explanations behind the variety in the highest dimension of the evaluations in which first languages are instructed rely upon the overall improvement of the language. In locales where:

Tthe language is generally very much created and has adequate number of teachers that they prepared in that language, training in the native language is offered up to grade 8. This is clear reality in Amhara, Tigrai, and Oromia Regional States. Districts that utilization first language up to grade 6 resort to the utilization of English as medium of instruction from grade 7 up wards. In any case, it would be exhorted if guidance in English were to start in grade 9 rather than in grade 7 Minister of Education (2002). This is on the grounds that the English language capability of students at the levels of grades 7 and 8 isn't adequate for the learning and instructing process.

In addition, as the vast majority of the individuals who complete Grade 8 won't proceed with optional instruction later on, yet rather take momentary preparing of different sorts and join the work compel learning in native language places understudies will be in a favorable position. A simple two-year time of English would not empower one to get a handle on ideas and prepare for the set preparing program. Additionally, a two-year English language study won't be adequate to make students capable in the language. It is greatly improved for districts, which have the ability to do as such, to encourage students in their separate first languages instead of in English in Grades 7 and 8.

Some Facts about Using Languages as Medium of Instruction across Regions: To the extent the utilization of languages as mode of guidance is concerned, it is conceivable to take note of how they are being utilized at present across regions and city administrations.

a) Oromia-Afaan Oromo, Amharic
b) Harari - Aderigna (Harari language), Afaan Oromo, Somaligna, Amharic
c) Benishangul-Gumuze-Amharic
d) S/N/N/P-SidamuAfo, Wolaytigna, Hadiyyisa, Kembatisa, Gediogna, Dawro, Kafinoono, Siltie, Amharic, Kebena, Korotie, and so on (in Non-formal and lower classes).
e) Tigray-Tigrigna
f) Gambela-Agnuwak, Nu'eir, Mezenger
g) A remote place - Afar, Amharic
h) Amhara - Amharic, Awigna, Hamtagna, Afaan Oromo (in Oromia Zone)
i) Somali-Somaligna

Challenges of the Current Language Policy
Educational challenges: In spite of the fact that the present routine's language strategy has such a large number of notable angles towards education, it is additionally in this segment different disadvantages have come to occur. Subsequently we may take note of the accompanying significant downsides of the arrangement in the instruction part:

a. Despite the fact that utilizing nearby languages in lower grade level is ensured by the constitution, it is getting to be fanciful to address the multilingual urban areas – state Addis Ababa. Here the medium of instruction is Amharic however there is high potential outcomes for child whose primary language isn't Amharic, to live in the city.

b. The present language strategy is decentralized at any rate in local states level – there exists irregularity in execution of language as medium of instruction in primary level across regional states.

c. Creating instructive materials, and creating orthographies and contents for different minority languages in SNNPR state in which over 70% of the Ethiopian languages is among the observational difficulties.

d. Absence of prepared labor is a challenge which obstructs utilizing of neighborhood languages in primary level of education.

e. Absence of mastery and network support over the span of language arranging and utilizing minor political choices towards language use are causing clashes.

Administrational challenges: Usually different minority ethnic gatherings in huge numbers may live in a district other than their very own in which one noteworthy language has completely utilized for authority reason. For example Oromos, Awi, Waghimura in Amhara zone; Kunamas and Irbo in Tigray are instances of Ethnic gatherings which are living in different states and left their unique areas for financial or different reasons. Since the language predominantly utilized in such locales are not the same as their very own they will discover hard to completely utilize their own language in various managerial dimensions for correspondence. In addition some local states like: SNNPR, Benshangual Gumuz, Gambella, and Harari: are confronting an issue of choosing significant authority language in the provincial dimension.

This is on the grounds that from the different languages none of them are spoken broadly. Thus they upheld to utilize Amharic as the language for authority correspondence in the territorial dimension. The urban areas which are regulated Federal government: Addis Ababa and Dire Dawa are additionally confronting a few issues with current language approach since these urban communities are home to various ethnic gatherings. Here Amharic is the official language of the organizations by supporting the useful difficulty of perceiving every one of the dialects verbally expressed by the inhabitants in these urban communities. Along these lines in such situation the phonetic, social and ethnic personality of the occupants is likely under inquiry.

CONCLUSION

As can be seen above on how Ethiopia is politically advancing "pseudo populism" and "visionary" native language approach, which has should give route for the improvement of the vernacularism, there are as yet unsolved inquiries and difficulties of the strategy

and related language arranging. As an assumptive parallelism, "minority" societies, values and ethno-anti-extremism might be advanced, allowed and endured. Thought on the paper be up on rest, on opposite side, a non-resumeable decay of generally shared societies, values, frameworks, structures, practices, occasions and correspondence medium are broadly exacerbated from tip-to-tip round the "map" of Ethiopia. Subsequently the aggregate impact of this system will without a doubt unfavorably break down Ethiopia. In like manner, it quickens monetary disappointment and social and social character chaos of the different ethnic gatherings of the biggest constituents in the nation. This thusly won't realize national solidarity and improvement.

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Shareholder wealth Creation and Economic Value Added Using M & A – A Miniature of Indian Pharmaceutical Industry

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ABSTRACT

Aim of the study: This study attempts to analyse whether the sample companies have been able to enhance shareholders wealth post-recession considering their M&A. The study attempts to explain how traditional measures of financial performance are influenced by M&A and their relation to EVA. Methodology: The researcher has used ANOVA and Regression as analysis tools for the study. Findings: It was found that there is a significant difference between the means of EVACE, ROCE, ROE and EPS. ROCE and ROE are significantly correlated to EVACE. Moreover, there is an insignificant bearing of ROE, ROCE and EPS on EVACE. Managerial Implications, and Scope for future work / Limitations: It can be concluded that M&A's are a better way of creating shareholder wealth as compared to inorganic growth strategies. But due diligence process must be carried in accordance with the plan of strategic motives. The pharmaceutical companies need to enhance their financial performance to generate shareholder wealth; otherwise, it will lead to investor dissatisfaction. The same method of analysis can be used for different study period and on bigger sample size.

KEY WORDS: CORPORATE STRATEGIES, EVA, SHAREHOLDER WEALTH CREATION, FINANCIAL RATIOS.

INTRODUCTION

The corporate restructuring embracing merger and acquisition is the prevalent mode of business blends. These blends played an indispensable role in the growth of numerous top companies over the world. In the United States, the first merger wave arose between

1890 and 1904, and the end of World War I lead to the second wave which sustained over the 1920s. The third wave inaugurated in the latter part of World War II and continued (Arthur, 1963).

Around two-thirds of the huge public corporations in the USA have merger or amalgamation in their antiquity. In India, nearby 1180 proposals for amalgamation of corporate bodies entailing approximately 2400 companies were filed with High Courts throughout 1976-86. These formed 6% of the $40,600 corporations at the commencement of 1976. In the year 2003-04, 834 mergers and acquisitions worth Rs 35,890 crore were recorded. In 2008, the M&A deals were US$19.8 billion. The Indian Corporations sensed that western countries

are captivating Indian market this led to the numerous mega-mergers and takeover(Bhattacharyya, 1988).

Mergers And Acquisition In India: Economic reforms and deregulation of the Indian economy post-liberalisation economy have fetched in additional transnational players in Indian Industries. The entry of international players amplified competitive coercion resulting in structural changes in Indian Industries. To survive in the market restructuring strategy was adopted by Indian industries through M&A. Researchers believe that mergers and acquisitions followed specific patterns according to the economic conditions. These patterns were identified considering the nature and behaviour of M&A (horizontal, vertical, and conglomerate) and were grouped in waves. The waves of M&A are caused by the combination of three major things economic, regulatory and technological changes which can be termed as "shocks".

The first wave (1890 -1905) of M&A occurred when United States corporations tried to create monopolies in various industries. The second wave (1926-1929) saw the creation of oligopolies and vertical integration between the companies. The main factor that led to this wave was the large availability of a capital investment in the market caused by the post-world war economic boom. The third wave (1965-1969) of M&A has been pigeonholed by tending towards diversification between companies. The economic boom once again swamped the market with economical money and gave rise to conglomerate M&As. The fourth wave (1981-1989) was characterized by a large number of Hostile takeovers and became a common alternative for enterprise growth through acquisitions.

The Fifth wave (1992-2000) was driven by the globalisation, boom in the stock market with market deregulation on its peak. The burst in the bubble of stock market led to the end of the fifth wave in 2000. In the sixth wave (2001-2008) the target companies were overestimated due to massive conjectures and dearth of seeming risks. This whole scenario was the root cause of the Subprime catastrophe in year 2007 because it dehydrated the credit and the world was embarked into recession, and the end of the sixth wave of transactions. Every wave follows a specific trend and is related to the economic conditions as well as regulations set by the government (Martinson, 2012; Cordeiro, 2014; Anastasia, 2016).

The data presented in the below Table No 1 for the period 2008 to 2109, reveals that considerable development in the M&A activities in India after the recession. The absolute number of M&A deals in 2018 was estimated at 836, which is 25 per cent advanced than the total number of transactions in the preceding year. However, there is a significant upsurge in the number of deals in the year 2015, which is 67 per cent compared to the earlier year 2014. The worth of deals has publicized variation; after rising to 69,313 INR crores in 2016 compared to 22,203

INR crore in 2015. The highest M&A deals value was 72,815 INR crores in 2018.

Table 1. M&A in India (2008-2019)

Year	Number	Amount (Rs Crore)
2019	604	50,059
2018	836	72,815
2017	666	54,254
2016	691	69,313
2015	609	22,203
2014	364	16,318
2013	286	4,167
2012	284	11,669
2011	302	7,517
2010	337	9,451
2009	327	4,418
2008	373	7,987

Source: Bloomberg, 2019

Figure : Graphical representation of . M&A in India (2008-2019)
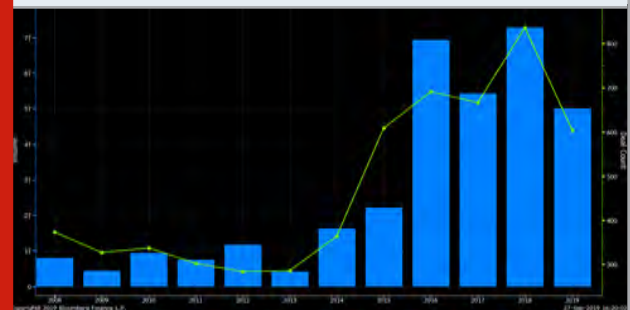
Source: Bloomberg, 2019

For an acquiring firm, a merger will make sense economically if it is beneficiary to the shareholders. The real owners of the company are the equity shareholders. They invest their money in equity shares of the business with the goal of accomplishing better capital appreciation along with stable and regular returns. When the combined present value of the merged firms is greater than the sum of their present individual values as separate entities, then the merger or acquisition will be termed as an economic advantage. As an example, firm a and firm b have an individual worth of VA and VB respectively, and worth of Vab in combination. If they merge, then the economic advantage will be realized if:

$$Vab > (Va+Vb)$$

The objectives are purely based on the financial stability and profitability of the business. The investment decisions are irrevocable and have long term effect on the business, so investors, consider the several factors like returns of

investments & market value of the firm which have an impact on the financial performance of the company. Shareholders wealth maximization is equivalent to maximizing the utility of their consumption over time in terms of returns. When seen from the perspective of the shareholder, the wealth generated by the actions of the company should be considered in the market value of the company. So, the wealth of shareholders is measured in terms of returns they receive and on their investments. These returns can be in the form of capital appreciation or dividends, or both (Pandey, 2010).

There are specific measures that investors consider, like accounting profitability measures, which include ROI, ROE, EPS, ROCE, and DPS, etc., and shareholder value measure includes EVA and MVA. The corporate strategies like mergers and acquisitions have a specific impact on financial performance and shareholder value. The fundamental question of whether mergers and acquisitions create value and enhance the financial performance, as well as shareholder value of the acquiring firms, has been of continuous interest to academicians and practitioners for many years. The capability to generate value through M&A respites on the principle that a firm can enhance or match its fundamental resources and skills via value-creating or synergistic blends with other corporations.

This study employs financial ratios and famous new value-based performance metrics; namely, economic value-added to measure the financial performance of acquirers. The objective is to assess financial success/failure in terms of shareholder value creation. Economic Value Added: this concept was defined and popularized by the US-based Stewart & Company (1991). It is considered the most accurate measure of the economic performance of the company. EVA is an approximation of actual economic profit. The amount by which earnings exceed or fall short of the required minimum rate of return investors could get by investing in other securities of comparable risk. The corporate segment in India progressively recognizes the significance of EVA as a consequence some Indian corporates viz., Samtel India Ltd, Ranbaxy Laboratories, etc., have commenced to calculate EVA. The first Indian company Infosys Technologies Ltd, reported EVA in annual report. EVA tries to gauge real economic profit as it contrasts the actual rate of return as against the required rate of return (Bhasin, 2013).

Calculation of EVA: When we are estimating EVA, the capital employed at the beginning of the year depicts the capital invested. The reason behind for considering beginning capital for calculation of EVA is that; a company will be able earn a return on its investment, after a minimum of one year. It should be noted that estimation of EVA entails some crucial issues., Therefore its each element has been discussed individually. EVA needs three different inputs for its calculation (Pandey, 2010). They enumerated below:

Where,

- NOPAT (Net Operating Profit after Tax)
- Weighted Average Cost of Capital (WACC).
- Capital Employed

Calculation of Weighted Average Cost of Capital (WACC):
The cost of capital is the expected return to equity owners (or shareholders) and to debtholders; so, WACC tells us the return that both stakeholders can expect. WACC represents the investor's opportunity cost of taking on the risk of putting money into a company.

- WACC = (Ke * We) + (Kd * Wd)
- Ke = Cost of equity, Kd = Cost of debt

Cost of equity by the CAPM (Capital Asset Pricing Model)
- Ke = Rf + β(Rm -Rf)
- Rf =Risk free rate, β= Volatility of the stock with respect to the market, Rm = Market return

Calculation of Cost of Debt
- Cost of Debt = (Total Interest Expense / Beginning Total Borrowings) × (1–t) × 100

Pharmaceutical Industry and its importance: Several factors influence the pharmaceutical industry. Among them, the major ones include the role of pharmacies, the growth of pharmacy benefit managers, and health maintenance organizations. There are many initiatives in regulating health schemes in several countries including India. All these factors strategically influence pharmaceutical companies, and in order to deal with these environmental changes' companies respond through mergers and acquisitions. The Indian Pharmaceutical sector being the huge and most progressive amid developing nations. The Indian pharma sector is 3rd largest in the world in consideration of volume and thirteen largest in value consideration. The sector is expected to expand with grow rate at CAGR of 12.89% over 2015-20 to seize USD 55 billion.

The Indian pharmaceutical sector claims 2.4% of the global pharma industry in value and 10% in volume. As the largest exporter of the generic medicine, India has exported worth USD 16.4 billion pharma products in 2016, and is inclined to achieve USD 20 billion by 2020. Many pharma firms have turned into mini giants of the Indian market; most of them are now dependent on exports. Corporations like Dr. Reddy's Laboratories, Cipla, Kopran, Cadila Healthcare and Sun Pharma have all gained US-FDA approvals; the primary standard to enter the US market. Utmost all the companies pursue the global tie-ups, in order to spread across new products, research, and have a debut pad for international market entry. In this industry, the market is influenced by doctors and pharmacists, who are the customers of the companies. They influence the choice of consumers, i.e., patients by prescribing medicines.

The customers (doctors) are, in turn, influenced by the medical representatives and market strategies of producers. Merger and Acquisition by Indian companies

are aimed at gaining new markets and new technologies. Enhancing the market size and thereby gaining higher economies of scale could be considered as the two critical motivations behind M&A in the pharmaceutical sector. According to KPMG report "The Indian Pharmaceutical Industry", (2006), it could be mentioned that domestic drug manufacturers in India are aiming foreign acquisition with the following goals in focus:

- Move up to the value chain.
- Enhance global competitiveness.
- Enhance respective production portfolio.
- Developing new markets.
- Increasing market share and revenues.
- Compensate the sluggishness they face in the domestic market.
- Acquire new assets, including research and contract manufacturing firms, in order to boost their outsourcing capabilities.
- Acquiring new products.

Research Objective: To analyze whether the sample companies have been able to generate value for its shareholders using both the measures of financial performance "EVA as well as accounting ratios. Furthermore, to analyse the result of EVA with traditional performance measures ROCE, ROE and EPS for evaluating the impact of ratios on EVA financial performance.

Literature Review: Firth (1980), examined the merger and takeover activity in the U.K by using a sample of U.K. takeovers. He analysed the impact of M&A's on shareholder returns and management and found evidence that was unswerving with the hubris hypothesis. The research indicated that it was only the acquiring company's shareholders, who suffered losses. The mergers and acquisitions were beneficial for the target company's shareholders and the acquiring firms' managers. Thus, we can say that, M&A's are more driven by the optimization of management utility reasons than by the optimization of shareholder wealth. A study carried out to investigate effect on wealth due to merger and acquisitions found that; mergers are value increasing dealings for target firms but value decreasing dealings for acquiring firms and concluded that takeovers are motivated by the agency (Malatesta, 1983). Thus, strategic motives have an effect on the financial accomplishment of the company.

Activity of merger and acquisition can mainly be explained by the factors, motivating a firm's growth and expansion. This is considered a faster and an efficient way of developing firm's asset base and productive capacity. (Vyas & Narayana, 2015). The merger and acquisition activity is condensed in definite time periods. The waves of M&A are caused by the combination of three major factors- economic, regulatory and technological changes (Harford 2005; and Zhou 2006).

Key intentions from the purchaser's perspective undertaking M&A deals are primarily identified with the choice rapidly to develop (rather than natural development through their own assets) and to get the admittance to elusive resources, specifically, human resources, auxiliary capital and client capital. Other extra intentions incorporate the accomplishment of collaborations, acclimation to changes, underestimated resources, botched issues, and tax savings, etc. From the merchant perspective, the key thought processes to sell the business incorporates the choice to transform equity into money, development augmentation, and top in valuation, proprietor's retirement, absence of admittance to capital (Tamosiuniene and Duksaite 2009). Key thought processes are gains from fortified market positions following the M&As (Coeurdacier et al., 2009).

As indicated by Gaphin (2010), at first, that is in the past decades, mergers and acquisitions were just money related exchanges meaning to control undervalued resources, and the objective was an industry or business totally different from the acquirer's centre business. Cash flow adequate only for debt repayment was the essential objective. Mergers and acquisitions lately are altogether different. Today, a typical merger or acquisition is very vital and operational in nature. This suggests that today, managers are not just purchasing underestimated resources as well as what they are purchasing are introduced client bases, better conveyance channels, more noteworthy topographical limits, hierarchical skills and an assortment of new talent.

All of these obtained factors in turn, offer more strategic opportunities to associations so they can increase an edge over their rivals' items products and services. Such associations are effective in consolidating business units trying to expand revenues and share prices. Singh and Mogla (2010) said that surveying the performance of mergers and procurement (M&A) can be done from bookkeeping information and market information. Market performance is the administration capacity to create the market estimation of the organization and is related to the market value in the stock exchange.

Sinha and Gupta (2011) found that the merger activity affects profitability positively while as deteriorated the liquidity pointing to the fact, that companies may have been able to leverage the synergies rising out of the transaction. Beholding to the findings of Krishnakumar and Sethi (2012) and Zollo and Meier (2008), it was suggested that both market measurement and accounting techniques must be used simultaneously to evaluate the performance after M&A in a more comprehensive way. Furthermore, according to Krishnakumar and Sethi (2012), event study is typically used in developed nations, whereas it may not work appropriately in developing nations such as India due to difference in the efficiency of the market. This echoes the scenarios of the corporations according to the shareholders' expectation and perception (Gunawan & Surakartha, 2013).

Sharma (2013), measured the post-merger performance of BSE listed companies and suggested that there was a marginal but not significant enhancement in the solvency and liquidity ratios whereas profitability ratios showed

significant deterioration post-merger. Haas and Hodgson (2013) stated that the result of full synergy logically can be seen in the financial performance of the fourth year after M&A because the synergy would be distributed amid all departments wholly by the end of the third year after M&A had been executed. Ahmed and Ahmed (2014), examined the post-merger financial routine of the acquiring banks in Pakistan and concluded that the financial performance of merging banks improved in the post-merger period but marginally.

Verma and Sharma (2014), studied the influence of mergers and acquisitions on the operation of Indian Telecom industry by reviewing pre- and post-merger financial and operating parameters. The research found that, companies have been able to leverage the synergies ascending out of the merger or acquisition, but couldn't upsurge the operating and financial execution. The adoptions of M&A's might have been mixed with the ambition of market integration, acquiring bigger size, empire building which led to worsening performance. Bertrand and Zitouna (2008) investigated the impact of horizontal acquisitions on the execution of the objective firms and inferred that both cross-border and homegrown merger and acquisitions have similar aftermaths.

Furthermore, they proposed that cross-border acquisitions have extra adequacy gains; it might be because of advanced innovation they are obtaining from abroad. In any case, profits are not heightened but increment in productivity shows the redeployment of efficiency gains at the creation stage. All things considered, recent investigations recommended that mergers and acquisitions create incentive for acquirers (Martynova and Rennebog, 2008). The value creation to any acquirer company depends on the kind of deal and qualities befuddled in the arrangement (Dutta and Jog, 2009). Saboo and Gopi (2009) compared the post-merger execution of firms associated with the homegrown and international acquisitions. They noticed that noteworthy contrasts exist in the monetary ratios of the firm post-merger relying upon whether it obtained a homegrown firm or a foreign firm.

Accounting proportions, for example, profit after tax, debt-equity ratios and profit for capital were studied and discovered that a large portion of the measures improved in one to two years post-merger in case of homegrown firms. While, similar proportions were negative for firms gaining foreign firms. Consequently, the result of the key accounting proportions of the procured firms represents that the effect of the merger was different for homegrown acquisition and cross-border acquisitions. The type of acquisition appears to play a pivotal part in the performance of the organizations.

For instance, Bertrand and Bestchinger (2011) claim that there are unpropitious effects accompanying acquisitions. Furthermore, firms that operate in developing markets have little leverage worth (capability of borrowing funds) due to truncated M&A experience and proficiencies, specifically for transnational acquisitions. The pharmaceutical concerns have restricted profits due to boundaries in product pricing, therefore, have to ponder other strategies of expansion and value creation. Merger and acquisitions enhance value of the firms by growing corporate control in the marketplace (Meena, 2014).

Objectives of the Study:
- To analyze whether the sample companies have been able to generate value for its shareholders.
- To analyse the both the measures of financial performance EVA as well as ratios.
- To analyse the result of EVA with traditional performance measures ROCE, ROE and EPS for evaluating the impact of ratios on EVA financial performance.
- Hypothesis Development:
- Hypothesis1

- $H0_1$: There is no significant difference between mean values of EVACE, ROCE, ROE and EPS.
- HA_1: There is a significant difference between mean values of EVACE, ROCE, ROE and EPS.
- Hypothesis 2.

- $H0_2$: There is no significant impact of ROCE, ROE and EPS on EVACE.
- HA_2: There is a significant impact of ROCE, ROE and EPS on EVACE.

RESEARCH METHODOLOGY

Sources of Data: This study is based on secondary data. To achieve our set objectives, required financial data of sample companies were collected from "Bloomberg Database". A database developed by Bloomberg L.P. The Bloomberg Terminal brings together real-time data on every market, breaking news, n-depth research, powerful analytics, communications tools and world-class execution capabilities in one fully integrated solution.

Sample Design: Some of the top Indian companies as per net sales are given in the money control with 38 acquisitions were selected as the sample for the study.

Figure 2: Net sales

Company Name	Last Price	Change	% Change	Net Sales (Rs. cr)
Cipla	500.60	-18.30	-3.53	12,374.01
Aurobindo Pharm	561.90	13.70	2.50	12,257.89
Lupin	752.00	-4.50	-0.59	11,356.32
Dr Reddys Labs	2,558.00	45.20	1.80	10,625.50

Source: moneycontrol

The sample of 38 acquisitions was selected by considering the availability of financial data for computation of EVA,

ROCE, ROE, EPS for the study period from 2009 to 2018 (post-recession period).

Data Analysis and Interpretation: Table No. 2 given below explains the number of mergers and acquisitions undertaken by the top Indian Pharmaceutical companies after the recession, including the recession year also. It is quite evident from the figures given in the table that the year 2015 has witnessed the highest number of M&As.

Principally, the concept of EVA respites on two principal proclamations: first, corporate is not really profitable lest it grosses return on invested capital that surpasses the opportunity cost of capital; and second, that wealth is formed when a firm's managers take positive NPV investment pronouncements for the shareholders (Grant, 2003).

The above table 3 illustrates the Economic Value-Added performance of sample companies for the post-recession years from 2009 to 2018. The table evidently discloses that there have been ups and downs in the EVA over the study period. A careful study of the results of Coefficient of Variation shows that Dr. Reddy has been able to add shareholder value consistently among all the with 6.44% variation followed by Cipla with 14.90% variation as obvious from their least estimates. It shows the two firms' capability to generate EVA steadily which means earning economic profits excess of their cost of capital.

Table 2. M&As of four Indian Pharmaceutical Companies after recession

Year	Aurobindo Pharma Ltd	Cipla Dr. Ltd	Reddy's Laboratories Ltd	Lupin Ltd	Total
2009	1	0	0	3	4
2010	0	3	1	0	4
2011	0	0	0	1	1
2012	0	1	1	0	2
2013	1	2	0	0	3
2014	2	1	1	2	6
2015	0	3	2	4	9
2016	0	0	2	0	2
2017	2	1	1	1	5
2018	1	1	0	0	2
Total	7	12	8	11	38

Source: Created from the information given in the Bloomberg, 2019

Table 3. EVA Calculations in millions (INR) computed from data available in Bloomberg.

Year	Aurobindo	Cipla	Dr. Reddy	Lupin
FY 2009	60.8009	3400.79	431.639	2651.66
FY 2010	1168.34	4033.73	-3611.7	3431.54
FY 2011	271.011	1743.99	1403	3762.82
FY 2012	-2352.4	2480.54	4646.57	3426.06
FY 2013	-210.77	4842.67	5616.07	8004.72
FY 2014	6871.51	1268.03	5260.61	10663.8
FY 2015	7136.67	-1335.5	5601.68	13325.5
FY 2016	3573.48	-4208.5	1435.5	5089.15
FY 2017	10274.4	-5417.5	-6623.4	1093.03
FY 2018	7992.52	-681.35	-8944.1	-13862
Average	3428.15	515.344	339.585	2154.86
Sd	4299.61	3458.40	5276.67	7288.05
COV	79.73	14.90	6.44	29.57

Source: Bloomberg, 2019

The upsurge in EVA escalates shareholders' wealth, Stewart (1994) has specified four mechanisms on which corporate business strategies ought to depend. Firstly, efficient utilisation of existing resources to magnify the operating performance, that will help in attaining higher interest rate on prevailing capital. Secondly, devoting additional capital in projects where earnings are higher than the capital cost. Thirdly, withdrawal (or shrinking) of capital from the non-paying projects that yield negative NPV. Lastly, to utilise an optimal capital structure for driving down the cost of capital.

Fundamentally, Economic Value Added on Capital Employed (EVACE) strives for signifying the association between 'EVA' and 'average' capital employed by company. Below Table 4 defines the performance of the sample companies grounded on EVACE during the study period. A vigilant investigation of the table discloses that the business concerns have been able to add value to their shareholders wealth post-recession with less variations. Lupin tops the list followed by and Cipla with variations 28.58% and 28.70% respectively. While the highest variation 36.14% was posted by Aurobindo.

We have selected three financial ratios ROCE ROE and EPS. These ratios measure the returns on invested capital in different products and projects; efficiency of using assets to generate profit and the last measure is relevant to the shareholders as it simply states how much earning each share has received.

Table 4. EVACE Calculations in millions (INR) computed from data available in Bloomberg.				
Company Name	Aurobindo	Cipla	Dr. Reddy	Lupin
FY 2009	0.268585	7.52349	1.156837	18.72933
FY 2010	4.71274	6.636839	-9.52812	16.37652
FY 2011	1.092917	2.874729	3.364185	14.42007
FY 2012	-9.24035	3.549473	10.61903	11.22947
FY 2013	-0.69308	5.813624	10.57461	19.40308
FY 2014	17.59339	1.944696	6.524057	17.71296
FY 2015	14.74795	-1.96413	5.995975	18.24727
FY 2016	6.224404	-5.4458	1.431049	6.166077
FY 2017	15.695	-6.43016	-7.42613	1.07593
FY 2018	10.35271	-0.69524	-9.96828	-13.5124
Average	26.85849	752.349	115.6837	1872.933
SD	9.780249	215.9335	33.63765	535.3566
COV	36.414	28.70125	29.07727	28.58386

Table 5. Return on Capital employed				
Years	Aurobindo	Cipla	Dr. Reddy	Lupin
2009-10	12.80	17.17	11.51	22.84
2010-11	13.79	13.22	11.38	20.71
2011-12	6.86	13.45	12.05	17.74
2012-13	12.25	15.01	13.45	23.56
2013-14	20.55	11.82	17.86	31.27
2014-15	19.52	9.68	11.90	26.97
2015-16	17.45	10.70	7.90	24.98
2016-17	14.87	7.12	6.09	22.07
2017-18	14.31	9.52	3.09	8.03
2018-19	10.49	9.65	7.90	9.55
MEAN	14.29	11.73	10.31	20.77
SD	4.12	3.00	4.17	7.28
COV	28.87	25.62	40.45	35.07

Source: Bloomberg, 2019

ROCE is quite common and relatively a useful performance measure. It pursues to associate the profits of the company with the entire capital employed by the company. It offers adequate understanding how proficiently the company is utilising the long-term funds. The rule of thumb for this ratio is "the higher

the ratio; the more efficiency of capital utilisation". The above table demonstrates the ROCE of the companies for the selected study period. It shows the intense ups and downs in the ROCE during these years. Yet, the mean ROCE throughout the study period marked at 20.77 by Lupin, followed by 14.29 by Aurobindo. On the other hand, the inflated variability in ROCE was specifically observed in the event of two companies, viz., Dr. Reddy and Lupin. The range of variation was observed to be minimum in the case of Cipla (25.62).

Table 6. Return on Equity				
Years	Aurobindo	Cipla	Dr. Reddy	Lupin
2009-10	32.50	21.07	15.14	33.23
2010-11	26.49	15.33	14.97	28.50
2011-12	-1.68	15.87	14.33	23.36
2012-13	18.26	18.36	17.45	29.38
2013-14	33.72	14.64	22.59	39.31
2014-15	32.36	11.15	16.83	29.95
2015-16	26.61	12.67	12.10	27.04
2016-17	22.31	7.87	11.69	23.54
2017-18	19.68	10.91	4.84	8.80
2018-19	14.34	12.63	10.43	9.35
MEAN	22.46	14.05	14.04	25.25
SD	10.71	3.85	4.73	9.68
COV	47.70	27.42	33.71	38.36

Source: Bloomberg, 2019

Table 7. Earnings Per Share				
Years	Aurobindo	Cipla	Dr. Reddy	Lupin
2009-10	9.709	13.69	50.15	15.08
2010-11	10.315	11.96	52.82	18.18
2011-12	-0.73	14	53.83	18.02
2012-13	8.52	18.77	74.54	28.19
2013-14	20.12	17.29	113.67	51.88
2014-15	26.005	14.71	98.6	53.41
2015-16	27.85	18.21	80.59	62.92
2016-17	29.16	12.13	83.05	69.63
2017-18	30.94	18.25	34.19	29.76
2018-19	26.11	23.45	76.98	34.03
MEAN	18.80	16.25	71.84	38.11
SD	10.98	3.60	24.21	19.86
COV	58.42	22.14	33.70	52.10

Source: Bloomberg, 2019

Table 8. Results of ANOVA – EVACE, ROCE, ROE and EPS

Sources of Variation	ANOVA Sum of Squares	df	Mean Square	F	Sig.	F-Critical Value	
EVACE	Between Groups	639.341	3	213.114	3.179	.036*	2.87
	Within Groups	2413.063	36	67.030			
	Total	3052.404	39				
ROCE	Between Groups	1046.331	3	348.777	7.637	.000*	2.87
	Within Groups	1644.127	36	45.670			
	Total	2690.458	39				
ROE	Between Groups	1210.123	3	403.374	7.098	.001*	2.87
	Within Groups	2045.884	36	56.830			
	Total	3256.007	39				
EPS	Between Groups	19749.161	3	6583.054	23.636	.000*	2.87
	Within Groups	10026.523	36	278.515			
	Total	29775.684	39				

Notes: SS = sum of squares; DF = degree of freedom; MS = mean square; *Significant at 5% significance level.

Table 9. Karl Pearson's Correlation matrix (EVACE, ROCE, ROE and EPS)

	Aurobindo			
	EVACE	ROCE	ROE	EPS
EVACE	1			
ROCE	.391	1		
ROE	.744*	.365	1	
EPS	.734*	.480	.347	1
	Cipla			
	EVACE	ROCE	ROE	EPS
EVACE	1			
ROCE	.903**	1		
ROE	.922**	.795**	1	
EPS	-.262	-.189	-.545	1
	Dr. Reddy			
	EVACE	ROCE	ROE	EPS
EVACE	1			
ROCE	.739*	1		
ROE	.629	.714*	1	.
EPS	.611	.663*	.433	1
	Lupin			
	EVACE	ROCE	ROE	EPS
EVACE	1			
ROCE	.927**	1		
ROE	.889**	.795**	1	
EPS	.039	.129	.132	1

**. Correlation is significant at the 0.01 level (2-tailed) *. Correlation is significant at 0.05 level (2-tailed)

The ratios return on equity measures the capability of the corporation in engendering profit per rupee of equity shareholders' funds. Going by pragmatism "the inflated the ratio of ROE, more significant is the efficiency of management and fund utilization. The above Table 6 provides the insights of the returns received by the corporations on the equity invested during the study period. The analysis of the ROE values reveals a non-fluctuating trend among two companies throughout the study period. The highest average ROE was reported by Lupin (25.25), trailed by Aurobindo (22.46).

Furthermore, Cipla and Dr. Reddy are at the same level in terms of ROE. This has divided the companies into the two groups, which reflects that Lupin and Aurobindo had capability to provide better returns to the equity investors in comparison to the other two companies in the sample. Though the latter group had not been able to provide returns but exhibited steady presentation in ROE as apparent from the least coefficient of variation of 27.24% (Cipla) and 33.71% (Dr. Reddy). Unfortunately, Aurobindo has the highest variation (47.790%).

Earnings per share are the profitability measure that indicates the profitability of the business on per equity share basis. There is no rule of thumb for interpretation of EPS. Generally, the elevated the EPS figure, the healthier it is for the firm. Earnings per share determine the lofty earnings and indestructible financial orientation; hence, a unswerving company to invest. Table no 7 provides a snapshot of the EPS of the selected companies for the study period. It is quite evident from the table that Cipla (16.25) has the lowest average EPS reported in the given period of study followed by the Aurobindo (18.80). At the same time, Cipla has the highest consistency in EPS (22.14%) among all the companies in the sample, followed by Dr. Reddy. The highest variation was reported by Aurobindo (58.42%).

The empirical outcome of ANOVA is recapitulated in Table 8. It is palpable from the below table that premediated values of 'F' are 3.179, 7.637, 7.098 and 23.636 for EVACE, ROCE, ROE and EPS, respectively. Meanwhile, the premediated value is soaring than the critical value at 5% significance level, the null hypothesis (H01) is rejected against the alternate hypothesis (HA1). Hence, it can be culminated that EVACE, ROE, ROCE and EPS of companies fluctuate significantly.

Table 10. Regression results of Aurobindo – EVACE as Independent Variable

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.918a	.843	.717	4.55101401000000	.843	6.711	3	4	.030	3.029

a. Predictors: (Constant), ROCE, ROE, EPS
b. Dependent Variable: EVACE

Coefficients

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-11.081	4.690		-2.363	.065
	ROCE	2.580	3.030	2.599	.851	.434
	ROE	.754	.380	.981	1.984	.104
	EPS	2.086	1.850	2.676	1.127	.311

a. Dependent Variable: EVACE

One of the purposes of the present study is "to glean the affiliation that subsists among EVACE and traditional means of corporate achievement". Hinging on the data, Table 9 reports the consequences of Karl Pearson's correlation. It is apparent that in the case of Aurobindo Pharma ROE and EPS are 'highly' allied with EVACE at 5 per cent significance level. The values of ROE and EVACE were 'exceptionally' correlated at 1 per cent significance level in instance of Cipla and Lupin. There is no significant rapport amid EVACE and traditional performance measure EPS in case of Cipla, Dr. Reddy and Lupin. On the contrary, EPS is significant but negatively correlated with EVACE when looking at results of Aurobindo. The outcomes of Cipla and Lupin displays significant relation amongst ROCE and EVACE, and ROE and EVACE at 5 per cent and 1 per cent significance level, correspondingly.
\
Moreover, in the case of Cipla & Lupin, ROCE and ROE are highly correlated with EVACE (5% level). Consequently, it can be approximately clinched: "ROE and ROCE changes in tandem with EVACE at an advanced degree". As a part of this study, ROE, ROCE and EPS are assumed as 'independent' variables while as EVACE is assumed as 'dependent' variable. The result of regression analysis of Aurobindo Ltd is reported in Table 10. The p-values for

all the ratios are higher than the significant value 0.05 which confirms acceptance of null hypothesis. Further, the value R-Square is .843 which means the variance of dependent variable is explained 84.3% so regression equation is best fitted.

The regression results of Cipla Ltd are reported in Table 11. The p-value for ROE is lower than 0.05, while as p-values of other two ratios is more than 0.05 which authorizes "the acceptance of null hypothesis at 5% level of significance". Further, there is significant effect of ROE on EVACE. Furthermore, to gauge the accomplishment of the regression analysis in forecasting the values of the dependant variables within the sample, R-squared is calculated. The value of R-square 0.960 illustrates that the regression equation is fitted best.

The outcome of the regression analysis of Dr. Reddy Labs is summarized in Table 12. EVACE is identified as dependent variable and ROCE, ROE and EPS as independent variables. The p-values for autonomous variables are more than 0.05, therefore null hypothesis is rejected at 5% level of significance. The R-squared estimates 0.662 discloses that the 66.2% of the variance of the dependent variable is enlightened by the independent variables.

Table 11. Regression results of Cipla Ltd – EVACE as dependent variable

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df 1	df 2	Sig. F Change	Durbin-Watson
1	.980ᵃ	.960	.928	1.308780493000000	.960	30.184	3	4	.001	2.342

a. Predictors: (Constant), ROCE, ROE, EPS.
b. Dependent Variable: EVACE

Coefficients

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig.
1	(Constant)	-24.120	3.924		-6.146	.002
	ROCE	.744	.720	.554	1.032	.349
	ROE	.981	.238	.828	4.122	.009
	EPS	.366	.189	.269	1.939	.110

a. Dependent Variable: EVACE

Table 12. Regression results of Dr. Reddy – EVACE as dependent variable

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df 1	df 2	Sig. F Change	Durbin-Watson
1	.813ᵃ	.662	.391	6.083200701000000	.662	2.445	3	4	.177	2.287

a. Predictors: (Constant), ROCE, ROE, EPS
b. Dependent Variable: EVACE

Coefficients

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig.
1	(Constant)	-10.470	12.529		-.836	.441
	ROCE	5.920	5.334	3.257	1.110	.318
	ROE	-.116	.800	-.070	-.145	.890
	EPS	.019	.126	.060	.153	.885

a. Dependent Variable: EVACE

Table 13. Regression results of Lupin – EVACE as dependent variable

Model Summary										
						Change Statistics				Durbin-Watson
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df 1	df 2	Sig. F Change	
1	.965a	.931	.877	3.6864322470000 00	.931	16.986	3	4	.004	3.082

a. Predictors: (Constant), ROCE, ROE, EPS
b. Dependent Variable: EVACE

Coefficients						
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	-20.248	5.587		-3.624	.015
	ROCE	.608	.569	.507	1.068	.334
	ROE	.533	.268	.407	1.985	.104
	EPS	-.088	.180	-.166	-.487	.647

a. Dependent Variable: EVACE

Table 13 represents the result of regression analysis of Lupin. EVACE being dependent variable while ROE, ROCE and EPS are assumed as autonomous variables. The p-values for autonomous variables are inflated than 0.05, hence the acceptance of null hypothesis of a zero coefficient at 5% level of significance. Furthermore, the R-squared estimate of 0.931 demonstrations fitness of the model.

Findings: The present study examined the shareholder wealth creation using inorganic strategies. In this regard, traditional measures of financial performance (ROCE, ROE and EPS) and EVA was analysed by using ANOVA and Regression analysis. According to the analysis of the data, Cipla has the highest number of M&A among all the companies, shows highest consistency among the sample companies in analysis of all financial ratios. At the same time, EVA is the lowest among all the companies because with the increase in the number of M&A cash outflow also increases and leads to a drop in EVA sharply after M&A. Lupin has the second-highest number of M&A and is more consistent in shareholder value addition revealed by the analysis of EVACE followed by Dr. Reddy Laboratories.

However, there could also be other reasons responsible for the drop of EVA like the operating efficiency as well as the changes in the cost of capital. Aurobindo with least M&A in number has neither added value to shareholders nor improved financial performance. It is quite evident form the analysis of financial ratios and potrays the highest variation, which means accounting profit is suffering. The variation in these ratios depicts that company has unutilised funds or idle capital available; because these measurements show the efficiency of capital utilisation.

The Empirical results of our study claim that M&A's have bearing on financial routine. The analysis of results revealed that higher variability in absolute figures of EVA, relative figures of EVACE and financial ratios was seen in Aurobindo Pharma. Aurobindo Pharma has lowest number of M&A in the sample companies. It is understood that uniformity in EVACE was marked by Lupin while in financial ratios Cipla recorded highest consistency. M&A is one of the better ways for shareholder wealth creation. It is evident from the outcomes of ANOVA that EPS, ROCE, ROE, and EVACE, and of the sample firms vary significantly. Further, the regression analysis depicted that traditional measures (financial ratios) do not impact EVACE significantly and EPS is negatively correlated to the EVACE.

CONCLUSION

The main motives of mergers and acquisitions is to create synergy and shareholder wealth. One of the significant financial goals of every company is to improve shareholder wealth. The investors are also looking for companies which could provide long-term yields on their investment. The financial ratios are the performance measures that help us to determine the returns of investments, but these measures don not theoretically correlate with shareholder value creation. To overcome the drawback, value-based measures are used to determine the wealth created by the companies like EVA. Economic Value Added is considered as the base on which company takes decisions associated with the choice of strategy, divesting, capital allotment or mergers and acquisitions. EVA is used to measure shareholder wealth creation.

The Indian economy is market-driven; therefore, several firms create wealth using M&A, whereas the most of

them destroy it. The pharmaceutical companies need to enhance their financial performance to generate shareholder wealth; otherwise, it will lead to investor dissatisfaction (Reddy et al., 2011). EVA governs the efficiency of earnings engendered by a firm to offset the cost of capital, i.e., whether the business concern is value creator or destroyer. The investor's wealth silently being tainted in insolvent plans which results in shareholders' treasure demolition (Sakthivel, 2010). It can be concluded that M&A 's are better ways of creating create shareholder value as well as destroying it.

Chen and Dodd (2001), recommended that "there are innumerable aspects interrelated to employees, clienteles, artefact quality, research & development novelties and community satisfaction, that distresses the firms' market value excluding financial aspects". The strategic decisions are irrevocable and have long term impact on the company's financial stability and success in terms of growth and expansion.

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Simulation of Hi-Technology Mask to Detect Various Diseases

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ABSTRACT

People all over the world are prone to many diseases that are known and unknown. However, suitable methods for detecting the diseases in early stage are limited. In todays world we need to figure the disease in early stage in-order to prevent the complications. This implementation of sensors in daily wearable things like mask helps the person to find the changes happening in the body due to different parameters like breathing, temperature and pulse rate. The abnormality in the human body can be detected using sensors. The features which are used for the assessment of diseases are researched and collected from various websites. The sensors which are listed to detect the changes in the body are quite accurate and some calculations are made in-order to achieve the accuracy. By placing the sensors in mask detection of temperature, heart rate becomes easier and the data can be acquired in mobile phone.

KEY WORDS: IOT, MASK, BIOMEDICAL DEVICE, PROTEUS, MICRO CONTROLLER.

INTRODUCTION

This assessment is a fundamental principle of the tools and programs to contribute to the welfare of human health. The diseases causing germs are identified by the symptoms. These symptoms are different for each disease. According to these symptoms, the types of disease and corresponding medications are prescribed. But some of the symptoms are identified only after the disease becomes severe. In-order to identify the symptoms in early stage these sensors are highly helpful. Covid-19 which is the most dreadful disease in current situation shows symptoms such as fever, drop in sp02

level and abnormality in breathing, which is a sign of severity in disease. In this case the use of temperature sensor, heart rate sensor will provide the change in body temperature and pulse. Through this the abnormality can be detected in early stage. Unlike covid-19, diseases like asthma, heart diseases which involves the variation in pulse, hypothermia etc. can be determined earlier. Implementation of these sensors together in mask, would help us detect and analyse the abnormalities in human body. This system would be body alarming device to give us the details about our body condition. This can be used in hospitals to test the patients just by wearing it, instead of using separate devices to check different parameters. This device would detect all the essential parameters for identifying the disease.

METHODOLOGY

The diseases are identified according to the symptoms. In-case of covid-19, the raise in temperature above 100F and drop in sp02 below 90 is a major sign. According to this criteria temperature sensor and heart rate sensor will detect these symptoms stage of asthma and other

respiratory problems. Normal breath rate of a person above the age of 12 is 12 to 16 per minute. If the breath rate exceeds that or is above 40 per min then it is the symptom of Pneumonia, bronchitis, asthma etc. The normal pulse rate of healthy person is between 60 to 100 BPM. When the heart beat rate falls below or above, it becomes the indication of heart disease. Unlike the person is involved in heavy physical activity. Placing the heart beat sensor in different parts of the body will give us fluctuating pulse rate.

Placing it by the side of ears will give us quite accurate result. pulse rate is obtained from carotid artery part of face, which is near the side of ear lobe. These results can be acquired by using these sensors separately, but it would be a lengthy process, expensive and time consuming. When we implement these in a single product, it would be of great advantage. By placing these in mask with high protection will acquire us promising multiple results. This wearable mask with these sensors would give the information about heart rate, temperature which are the two main essential parameters necessary for identifying the diseases. These data can be displayed in the app. This mask would not only prevent from spread of infection, but also detect the changes in the person's body who is wearing it.

Table 1. Data Sheet Of Diseases And Their Symptoms

s.no	disease	symptoms	Normal body specifications	parameter
1.	Covid-19	Raise in temp above 100F Drop in SpO2 value below 90%	Body temp: 97.8F–99F SpO2: >90 (greater than 90) Normal heart beat rate: 60 to 100 BPM	Temperature, heart rate
2.	hypothermia	Drop of body temp below 95F	Body temp: 97.8F–99F	temperature
3.	hyperpyrexia	Raise in temperature Body temp: 106F(41.1C)	Body temp: 97.8F–99F	temperature breathing
4.	Pneumonia, bronchitis	Breathing rate above 40/min	Normal breath rate: Birth to 1yr - 30 to 60 1 to 3 yr - 24 to 40 3 to 6 yr - 22 to 34 6 to 12 yr - 18 to 30 12 to 18 yr – 12 to 16	
5.	TTN transient tachypnea	Breathing rate above 60/min		breathing
6.	Asthma	1. Pulse 100 to 125 per min (children older than 5) 2. Pulse rate <140 (2 to 5) 3. Respiratory rate of 20 to 30 /min (older than 5 yrs)	Normal heart beat rate: 60 to 100 BPM	Breathing, heart rate
7.	Heart diseases	less than 60BPM more than 100 to 200 BPM	Normal heart beat rate: 60 to 100 BPM	Breathing, heart rate

Figure 1: Process flow using sensors and components
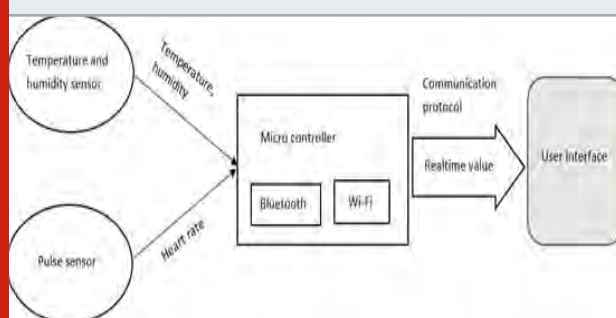
These signals can be sent to phone and can have a tract of the changes daily. The person can have the tract in history of changes of his body. By placing the heart rate sensor on the internal carotid artery, the pulse rate can be obtained. These data are collected from web sources and are listed in TABLE 1. By simulating using these sensors and below mentioned data the type of disease can be detected. The process flow is mentioned in Fig 1 and Fig 8. The temperature sensor not only detects the change in temperature (Liang et. al. 2011), but also the humidity and by using these parameters breath rate can also be detected. The count of breath rate can detect the primary.

Process flow of the Hi Tech Mask: The values or parameters like body temperature and pulse rate are detected through the temperature and humidity sensor, pulse rate sensor respectively. These signals are then passed to the microcontroller. The microcontroller converts these signals to actual values. The actual range for detection is fed in the microcontroller in the source code. By comparing the values obtained by internet data shown in TABLE 1 and calculated values (1) the symptoms can be predicted. These information are then passed to the user interface wirelessly. The micro-controller with Bluetooth and wi-fi can be used to transmit the information wirelessly. The suggestion for type of sensors and micro-controller is listed in TABLE 2.

Table 2. Data Sheet Of Sensors Used		
S.no	Name of the sensor	specifications
1.	Temperature, Humidity,	BME280: pressure sensor BME280 Pressure: 300...1100 hPa Temperature: -40...85°C Average current: 1.8 µA to 2.8 µA Humidity sensor: Response time (τ63%): 1 s Accuracy tolerance: $\pm$ 3 % relative humidity Hysteresis: $\leq$ 2 % relative humidity Pressure sensor: Sensitivity Error: $\pm$ 0.25 % Temperature coefficient offset: $\pm$1.5 Pa/K (equiv. to $\pm$12.6 cm at 1°C temperature change)
2.	Heart rate sensor MAX30102	MAX30102: Heart Rate Monitor and Pulse Oximeter Biosensor has Low-Power Heart-Rate Monitor (< 1mW) Ultra-Low Shutdown Current (0.7µA) Fast Data Output Capability
3.	Microcontroller ESP32	ESP32-WROOM-32: 32-bit LX6 microprocessors 448 KB ROM for booting and core functions 520 KB on-chip SRAM Wi-Fi: 802.11n up to 150 Mbps Bluetooth v4.2 BR/EDR and BLE Wi-Fi mode Operating temperature -40 + 85C Operating voltage: 2.2-3.6V Consumption: 80 mA type

Mask structure: These figures are designed using solid works software (Jiang et. al. 2007). The structure is designed in such a way that it consists of vent for placing the controllers and sensors. The material of mask is listed below. Three types of material are suggested and will consist of three layers of protection. The vent is shown in Fig 2. In Fig 2 the place for keeping pulse rate sensor is shown(a). Since the pulse rate is obtained from carotid artery part of face (near ear), the place of pulse rate sensor is designed in strap. The complete view of the mask is shown in Fig 2, Fig 3, Fig 4 and Fig 5. The 3D image was designed in order to get better illustration of the device (Swennen et. al. 2020; White & Shakeel et. al. 2017). The position of temperature sensor is shown in Fig 1 (b).

MATERIAL AND METHODS

Polyester: Polyester is preferred as second layer in the mask. Polyester has excellent shape characteristics. Polyester fabrics can be used for a long period after being washed several times. It lasts for longer period, flexible, non-deformable, anti-corrosion, insulating and is less maintenance (Baowu et. al. 2001). Polyester is suggested as second layer because of the following advantages.

Polyester material advantages
- good flexibility.
- The modulus of elasticity of polyester is 22 to 141 cN/dtex, and is 3 times greater than nylon.
- Synthetic fibre has good heat resistance and thermo-

plasticity.
- Good chemical resistance

Figure 2: Front view
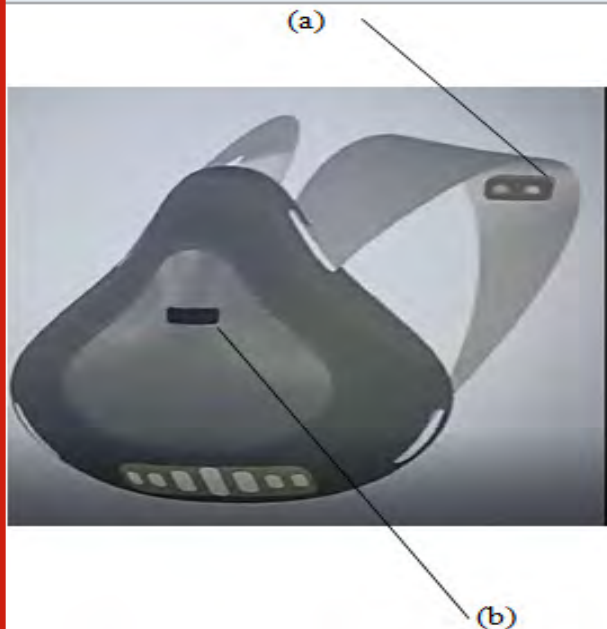
Figure 3: Side view
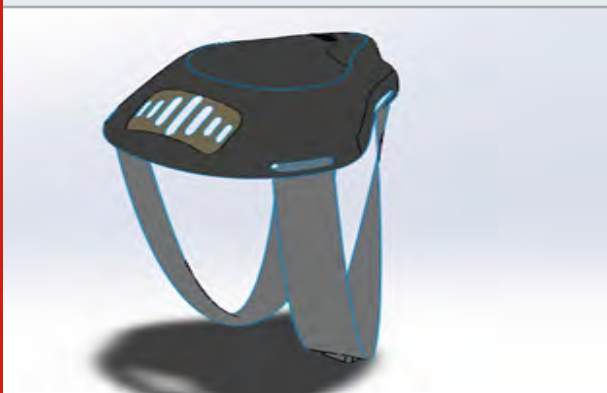
Cotton: Cotton is preferred for inner most layer of the mask. Cotton will keep you cool when the temperature is hot and provide insulation when the temperature is cool. Dermatologists prefer cotton as it rarely causes irritations or any allergic reactions. Cotton is breathable, soft, and super comfortable (Konda, & Guha et. al. 2020). It causes negligible irritation to skin and thus it is preferred as inner most layer.

Polypropylene fibre: Polypropylene fibre is preferred for the outer layer. This fibre is thermoplastic, resilient, light weight and resistant to mildew and many different chemicals (Demir et. al. 2015).
PP has the following properties:

- low heat resistance
- excellent chemical resistance

Figure 4: Top view

- low price
- light weight
- strong
- flexible
- has low thermal conductivity – 6.0
- has excellent electric insulation
- moisture absorption is 0 to 0.05%

Figure 6: N-95 FILTER

Filter: The N-95 filter, restricts 95% of the airborne particles. This filter is considered equivalent to respiratory regulators. It is a fine mesh of synthetic polymer fibre. This can be used for continuously more than 8 hrs. some are available in polypropylene fibre (Bałazy et. al. 2006). It consists of no-oil based particles. It is specially designed for industrial workers and medical professionals (Grinshpun et. al. 2009).

Figure 7: simulation result
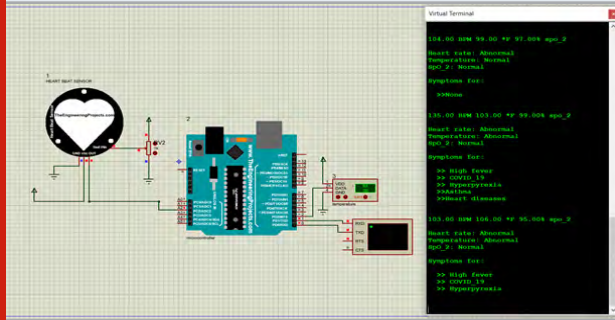
RESULTS AND DISSCUSSION

The simulation is done in Proteus 8 Professional (Xiao-dong, X. U. 2009). In this software, the desired components such as Heart Beat Sensor, microcontroller, Temperature sensor are used for the simulation as shown in Fig 7. The components used for simulation are already available via software. These components can also be replaced by other sensors like in TABLE 2. The simulation results are listed in TABLE 3.

The desired sensors and microcontroller are selected and placed in the schematic working area. Each sensor is selected and connected to the microcontroller. The actual values are provided and limitations are specified in the source code. Finally, the results are obtained by running the simulation. Some calculations are made in order to find the SpO2 value (1).

$$SpO_2 = 100 \times \frac{C[HbO_2]}{C[HbO_2] + C[RHb]} \qquad (1)$$

$C[HbO_2]$ is the concentration of HbO_2 oxyhemoglobin in arterial blood and $C[RHb]$ is the concentration of RHb. The arterial blood oxygen saturation level in human are 95-100%. If the level is below 90 then it is called hypoxemia. Covid-19 is determined when the SpO_2 value is below 90. Peripheral oxygen saturation (SpO_2) is an estimation of oxygen saturation level.

Flow chart of simulation: The process begins with fetching values from the sensors using microcontroller. These values are then processed with their respective modules to get accurate values. The calculated values are then displayed in the virtual terminal. The values are then checked if they are normal for an individual. If they are abnormal then control flows to the decision function. There the parameters, symptoms for possible diseases are compared and calculated, then it's passed to main program. These information and contents on the terminal are displayed in the mobile application through BLYNK service system (Todica, M. 2016). This entire process repeats itself with some interval. The flow chart of simulation is given in below Fig 8.

Figure 8: flow chart of simulation process
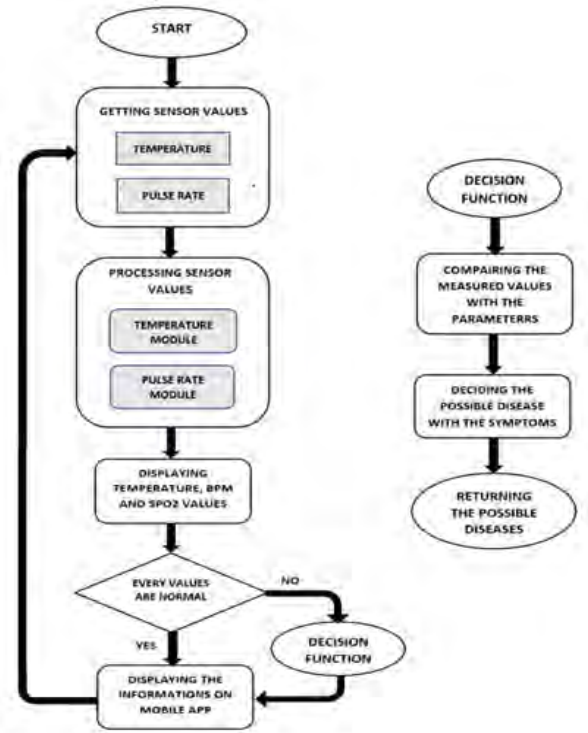
The simulation is done for three cases, in which different types of diseases are found related to the victim symptoms. It is displayed using virtual terminal. For the first case, there is increase in heart rate(104 BPM) , normal body temperature (99F)and spo2 level is above 90 which is normal(97%). According to this symptom, there are no possibilities of getting affected by diseases, thus the victim is safe. Similarly, for the second case there is increase in heart rate (135 BPM), slight raise in body temperature (103F) and spo2 level is normal (95%). Thus in this case the victim is likely to get high fever, COVID_19, hyperpyrexia, asthma and heart diseases. In the third case, the spo2 level is normal (95%), increase in body temperature (106F) and heart rate (103 BPM), which is abnormal. According to this, the victim might suffer from COVID_19, hyperpyrexia and high fever. These simulated results are verified to be quite accurate. These are diplayed in Fig 9.

Mobile app features: For recruiting the results in mobile app, BLYNK service is used here (Doshi et. al. 2017). BLYNK is a platform, which allows to quickly build interfaces for controlling and monitoring devices from IOS and android devices. It helps to control Arduino, raspberry pi and other microcontrollers too. The values which are calculated and processed on the microcontroller is sent to mobile app through cloud service or through LAN. The terminal where the live values and other information are displayed can also be viewed in the app. The values on the app is refreshed every pre-set number of seconds. This app is helpful in tracking the health condition of the person. They can have a record of it. This will be useful in analysing the body condition of the respective person.

s.no	case	Symptoms	result	Prone diseases	Normal body specification
		Table 3. The Results Of Simulation For Three Different Cases			
1.	Victim 1	Heart rate: 104 BPM Body temperature: 99F SpO2: 97%	Heart rate: abnormal Body temperature: normal SpO2: normal	NONE	Heart rate: 60 to 100 BPM Body temperature: 97.8F-99F SpO2: >90 (greater than 90)
2.	Victim 2	Heart rate: 135 BPM Body temperature: 103F SpO2: 99%	Heart rate: abnormal Body temperature: abnormal SpO2: normal	1) High fever 2) COVID_19 3) Hyperpyrexia 4) Asthma 5) Heart diseases	Heart rate: 60 to 100 BPM Body temperature: 97.8 F-99F SpO2: >90 (greater than 90)
3.	Victim 3	Heart rate: 103 BPM Body temperature: 106F SpO2: 95%	Heart rate: abnormal Body temperature: abnormal SpO2: normal	1) High fever 2) COVID_19 3) Hyperpyrexia	Heart rate: 60 to 100 BPM Body temperature: 97.8F-99F SpO2: >90 (greater than 90)

Figure 9: display of symptoms in virtual terminal

the information reaches out the concerned person. This application can also be improved on design and algorithms to improve the accuracy of the parameters and to get more information on the app.

Figure 10: Display of symptoms and diseases

Future Work: In future this can be implemented to connect all the masks of the same type under a network like a mesh network and the data of the abnormal individual can be detected and shared to other users under the same network. This will alert the users on the locality over a certain distance and thereby eliminating the spread of diseases and infections. This might also help the people in the locality to be aware and to seek the doctor for help. This can also be used to integrate the app with contact tracking application, such that

DISCUSSION

In this paper we have summarized the detection of various diseases in the early stage using the sensors present in the mask. The mask is suggested to have three different materials in three different areas. These materials are suggested on the bases of human body condition and sensors effectiveness. Polyester is proposed as second layer, cotton as inner most layer and polypropylene fibre

as outer layer. The simulation is done for three different cases and the results are shown. By Using this mask, the symptoms can be received in phone and the person can have a record of his health condition. This can also be used to sense the other person health condition by using the Bluetooth features available in the micro-controlled used. This is possible only if the second person wears this same mask.

CONCLUSION

A low-cost, daily wearable, efficient detector in mask is illustrated. It is based on the change in temperature, heart rate and breath rate the diseases are detected. This is a portable three- layer mask with suitable fibre material. A sensitive flexible sensor is used to sense the changes in human body and effective microcontroller system is used to extract information from the signal and the data is acquired in mobile phone. This will be portable and more efficient in acquiring the changes in human body. This will be a multi-purpose device which sense the major parameters responsible for diseases. This is mainly devised based on the current pandemic (covid-19). This will sense the infection quicker and will help in diagnosing it. The information of the victim health can be recorded by using the mobile app. The person can have a track of his health data.

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Study on Price Discovery of Selected Indian Agriculture Commodity with Special Orientation to Ncdex

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ABSTRACT

Commodity Future market has major economic implications by performing several economic functions. It includes price discovery function, hedging functions, price stabilization function, Liquidity function and finance function An efficient commodity futures market attracts number of investors in the futures market. The special feature of the futures market is price discovery and risk minimisation and there are many complications related to price signals, volatility spillovers, price discovery in spot and futures of Indian commodity market. This study empirically analyses both the market to understand which reacts first in India by assessing the relationship between spot & future prices of selected agricultural commodities such as Chana and Castor Seeds traded in NCDEX for 2016- 2018.

KEY WORDS: COMMODITY FUTURE MARKET: PRICE DISCOVERY.

INTRODUCTION

India Being an agricultural economy faces price risk. With the advent of derivative trading in commodities which provides producers and consumer not only with correct price signals but also with tools for managing price risk. Commodities have attracted quite a considerable interest as an investment avenue in recent years. Indian commodity derivative market has a very long history. However, the first organized commodity future trading was started in cotton in 1875 by Bombay Cotton Trade Association. The policies with regard to commodity future trading have taken several turns over the years where there were several years that witnessed a ban on trading. Commodity future market in india has been

restructured in 2003 and futures contracts trading has seen improvement in terms of volume and value flow with very rapid growth during that period. It elevated itself to compete in the international market with worldwide giants, such as NYMEX,CBOT, LME, etc.

Chana: The chickpea or chick pea (Cicer arietinum) is an annual legume of the family Fabaceae, subfamily Faboideae. Its different types are variously known as gram or Bengal gram, garbanzo or garbanzo bean, Egyptian pea. Chickpea seeds are high in protein. It is one of the earliest cultivated legumes, and 7500-year-old remains have been found in the Middle East.

In the list of food pulses chana takes third position thoughout the world which comprises 25% proteins, which is the maximum provided by any pulse and 60% carbohydrates. Chana is used throughout the world as an edible seed and is also used for making flour.in 2018, world production of chickpeas increased over 2017 levels by 16%, rising to a total of 17.2 million tonnes..India led production with 66% of the global total, while Australia, United States, and Turkey were secondary producers.

Chickpea is grown in September to November (Rabi Season) month in India. The maturity period of desi type chickpea is 95-105 days and of kabuli type chickpea is 100-110 days.. In India, it is harvested in February, March and April

Castor Seed: Castor is a plant that produces seeds (beans). Castor oil is produced from ripe seeds that have had their outer covering (hull) removed. Castor oil has been used as a medicine for centuries.Castor oil is used for constipation and bowel preparation prior to colonoscopy, childbirth, and many other conditions, but there is no good scientific evidence to support these uses. The hull of the castor seed contains a deadly poison called ricin. This is why the hull must be removed before use. Ricin has been tested as a chemical warfare agent. Weapons-grade ricin is purified and produced in particles that are so small they can be breathed in.

Castor plant is cultivated in 30 different countries. India, China, Brazil, Russia, Thailand, Ethiopia and Philippines are major castor seed growing countries which accounts about 88% of the world's production. In India it is a kharif crop, sowing in July-August and arrivals from December onwards till March. The chief producing state in india is Gujarat having a share of 86% of domestic production, followed by Andhra Pradesh and Rajasthan.

Review of Literature: Review of literature is the collection and presentation of earlier research works for the determination of precisely knowing important information relating to the present research and research methodology. Well structured review of literature is arranged orderly along with references with the specific format of referencing, apt use of terminologies and concepts and complete details of previous research works in relation with research problem under consideration for the present study. Most importantly, it is carried out for the drive of locating gaps in research, constructing research framework and procedures.

Reviews on Earlier Studies: Lokare (2007) studied performance of the selected Agricultural commodity future trading in India. The monthly future and spot prices of potato, caster seed, pepper, mustard and gur for the period from 1990-2005 and Cointegration and ADF were used to analyze data. The findings showed that there is a positive co-integration between the cash and future prices of pepper, mustard and gur.

Nath and Lingareddy (2008) investigated the impact of the invention of futures trading on spot prices of pulses for the period of January 2001 to August 2007. Simple percentages, correlations, regression analysis and Granger causality were used for analyzing the causal relationship. Results revealed that Futures trading had a positive and significant causal effect on volatilities in spot prices of urad while the same cannot be established for gram and there was a volatility spill over from urad to food grains. Sahadevan (2008) assessed which market influence the mentha oil futures on spot prices and daily spot market price for mentha oil futures traded on MCX

and NCDEX, in the year 2007. Johnson Cointegration and granger causality tests were applied and results showed that both prices were cointegrated. Price is discovered in future market and it is influencing the spot market prices.

Hernandez and Torero (2010) observed dynamic relationship between spot & future prices of agricultural commodities. The spot data for weekly (Friday) prices obtained from the Food and Agriculture Organization of the United Nations (FAO). International Commodity Prices Database were in U.S. dollars per metric ton (US$/MT) for the period of from January 1994 to June 2009 for corn and soybeans and from January 1998 to June 2009 for the two varieties of wheat were taken for the study. Granger causality test was used. The results showed that Price changes in futures markets led price changes in spot markets more often than the reverse, especially when examining returns and the causal link appeared to be stronger and more persistent.

Kumar and Pandey (2011) investigated the cross market associations of Indian commodity futures for nine commodities with international futures markets outside India for Soybean, and Corn, three metals: Aluminum, Copper and Zinc, two precious metals: Gold and Silver, and two energy commodities: Crude oil and Natural gas. futures contracts traded on MCX were used and data were collected from 2004 to 2008. Cointegration and vector error correction model were used. The results of long run cointegration between Indian futures prices and their world counterparts indicated that for all the nine commodities studied, the Indian markets were co-integrated with the world markets. The Granger Causality test results and variance decomposition of forecast error of VECM model indicated that there existed one-way causality from world markets to Indian market in utmost of the commodities. The impact of CBOT on Indian agricultural futures market is unidirectional and approximately 30% - 40% variations in returns of Indian commodity futures were explained by CBOT futures prices.

Bhanumurthy et al (2012) examined casual relationship with spot and futures agricultural commodity prices. The daily prices from June 2005 to December 2011 were collected for the study and co-integration, granger causality and error correction models were used. Results indicated that there was increasing integration of spot and futures market prices. Future prices Granger caused spot prices while the shock in futures prices appeared to have impact on the spot prices at least for five month period with a maximum impact at a lag of one month. Changes in rainfall affected both futures and spot prices with different lags. The results from the bivariate causality between the variables of interest, particularly with rainfall, supported the theoretical relationship between these two markets, which was clearly different from the conclusions of the AbhijitSen Committee. The results from the variance decompositions and impulse responses only support the direction as well as the extent of impact future prices have on the spot prices.

Efe-Omojevw (2013) studied the efficiencies of maize and wheat futures markets in India. The study used data obtained from the database of the Indian National Commodity Derivative Exchange (NCDEX) on the futures trading of the commodities for the period of January 2006 to June 2011. The daily price data was converted into monthly price data. Stationarity of the data was determined with a unit root test using the Augmented-Dickey Fuller (ADF) method. Augmented Engle-Granger (AEG) co-integration test of unit root was applied on the obtained residuals of the long-term equilibrium regression. The existence of co-integration means the price relationship between futures and spot can be adequately represented by an error correction model (ECM).

The presence of co-integration was an indication of interdependency between the price series and it supported the findings of unbiased-ness of the futures price in estimating the future spot prices. Consequently, the futures market was an optimal forecaster of future spot rates and was able to play the major role of price discovery. The convergence of the futures and spot prices was reinforced by the negative error correction terms that helped to minimise losses and gains in futures contract payments as contract maturity draws close. The futures markets were found to be weakly inefficient as they contained additional information that traders could use to make additional gains.

Chhajed and Mehta (2013) studied price discovery and behaviour of commodity markets in Indian Agriculture Commodity Markets. Nine agriculture commodities viz., wheat, chana, soybean oil, jute, mentha oil ,rubber, potato, crude palm oil and cardamom were considered for the study. average monthly spot and future prices trading on MCX and NCDEX during 2009-2010 were considered for the study. Granger causality test was used to test the causality effect of future market on spot market and vice-versa. The market behaviour was studied with the help of backwardation and contango. The result indicate that most of the commodities showed bi-directional causality between spot and future prices. The contango and backwardation helped in identifying the hedging opportunities in the market.

Aggarwal et al (2014) investigated price discovery and hedging effectiveness of commodity futures. The data used for the study was obtained from MCX, NCDEX, and NMCE for the period between 2003-2014. The daily closing price data on both the spot and the futures prices of pepper, soya oil, sugar, wheat and rubber were taken for analysis. Cross-correlations, co-integration and Granger causality were use and results indicated that future market influenced the price discovery for all the commodities and risk reduction was not effective there was a relationship between spot and futures prices and they were co-integrated for all agricultural commodities.

Haq and Rao (2014) examined effectiveness in the long-run for four different agricultural commodity futures

markets and also to determine short run and long run cointegrationand whether there is any pricing biases existed in these markets. For Channa, Chilli, Guar Gum, Guar Seeds, Jeera , Refined Soy Oil, Soy Bean and pepper the data set used was from March 2006 to Dec 2011, Barley from Mach 2007 to Dec 2011 and for turmeric the data used was from March 2009 to Dec 2011. ADF, Cointegration test and Vector Auto Regression (VAR) were used to analyze data and the results indicated that spot and future prices of agricultural commodities were cointegrated in long run and the markets for all commodities were efficient in long run. However, short run inadequacies and pricing prejudices existed.

Nirmala et al (2015) analyzed price discovery process in respect to cardamom, whether Cardamom future market serves as a price discovery mechanism for spot market prices and vice versa.The analysis involved use of econometric tools like Augmented DickeyFuller (ADF) test, Granger Causality test and Cointegration technique. The daily closingdata from 2012 to 2013 had been taken for the study.for analysis. findings suggested that, cardamom futures price movement could be used as price discovery vehicle for spot market transactions.

Ahmad (2015) studied the Malaysian crude palm oil futures before and after Shari'ah-compliance and there price duiscovery function. The data of crude palm oil futures and crude palm oil prices for the January 2007 until December 2011 period was collected and tested using ADF and PP Test. The results of the Augmented Dickey Fuller (ADF) and Philips Perrons (PP) unit root tests suggested that the CPO and FCPO series were stationery at first difference. Johansen's co-integration test indicates that FCPO and its underlying spot market for both periods were co-integrated, implying that there was a causal relation between the two markets. In period I, the estimated results of Vector Error Correction model (VECM) indicated a one-way causality direction from the CPO market to the FCPO market in the long run.

Research Gap
(i) The numbers of quality research in the field of commodity markets are limited..
(ii) There is a need to study the causal relationship between spot markets & future markets on various sectors of agricultural commodities
(iii) There is a need to study Price Forecasting

Objectives
1. To check Stationarity of Commodity Prices
2. To Estimate cointegration between future and Spot Prices markets
3. To Check the Cause and Effect relationship between spot & future prices markets

METHODOLOGY

Data Collection: Data is collected from National Commodity and Derivative Exchange(NCDEX) of daily closing prices from 2016 to 2018.

Period of Study: The study uses the sample period of 2 years from 2016 to 2018.

Scope of the study: This study observes the relationship between spot & future prices of agricultural commodities such as Turmeric and Chilly from 2016 to 2018 traded in NCDEX,

Hypotheses–

H_0: Time series data is non Stationery
H_0: There is no significant long-run and short run association between commodity futures and spot prices
H_0: Spot price does not granger cause future
H_0: Future does not granger cause spot

Statistical Tools for Analysis
a) Augmented Dickey Fuller Test.
b) Johansen's co-integration model and VECM Model.
c) Ganger Casaulity Test

Stationary of Commodity Spot and Futures Prices
H_0: Time series data is non Stationery
H_a: Time series data is Stationery

Since the probability value id greater than 0.05 null hypothesis is accepted. The above table shows the results of stationarity test on the n values of prices of series of spot and futures of Chana and castor seeds respectively. The result of the ADF test confirm that the data series of spot and futures prices is non- stationary at level form (p>0.05) and the data series of spot and futures is stationary at level form (p<0.05). Hence Johansen Test of cointegration is used to check long run equilibrium relationship between spot and future prices of sample commodities. As a result of cointegration is sensitive to lag length.

Long run Association between Commodities Futures and Spot Prices

			Level – Trend		Level- Trend and Intercept		Level None	
			t-Statistic	Prob.*	t-Statistic	Prob.*	t-Statistic	Prob.*
Chana Spot	Augmented Dickey-Fuller test statistic		-0.499435	0.9864	-0.889334	0.9544	1.359399	0.9564
	Test critical values:	1% level	-3.457515		-3.996754		-2.574633	
		5% level	-2.873390		-3.428660		-1.942153	
		10% level	-2.573160		-3.137757		-1.615818	
Chana Future	Augmented Dickey-Fuller test statistic		-1.808582	0.3758	-2.200914	0.4865	0.299631	0.7717
	Test critical values:	1% level	-3.457515		-3.996754		-2.574633	
		5% level	-2.873390		-3.428660		-1.942153	
		10% level	-2.573160		-3.137757		-1.615818	
Castor Seeds Spot	Augmented Dickey-Fuller test statistic		-1.877313	0.3427	-1.918973	0.6415	-0.094257	0.6502
	Test critical values:	1% level	-3.457630		-3.996918		-2.574674	
		5% level	-2.873440		-3.428739		-1.942159	
		10% level	-2.573187		-3.137804		-1.615814	
Castor Seeds Future	Augmented Dickey-Fuller test statistic		-1.715507	0.4222	-1.647683	0.7711	-0.226372	0.7512
	Test critical values:	1% level	-3.457515		-3.996754		-2.574633	
		5% level	-2.873390		-3.428660		-1.942153	
		10% level	-2.573160		-3.137757		-1.615818	

H_0: There is no significant long-run association between commodity futures and spot prices
H_a: There is a significant long-run association between commodity futures and spot prices

The table shows the result of Johnsen test of cointegration ,The result reveals that there is a presence of one cointegration equation between spot and future prices of Chana and Castor Seeds and this signifies the long run association .The trace results points out the number of cointegrating equations equation are less than or equal to one; whereas Maximum Eigen Value test results confirm the presence of one integration equation examine the

lead lag relationship or the long run and short run speed adjustment or convergence towards equilibrium between spot and future prices.

long-run and short-run adjustments (causality) between spot and futures prices

H_0: There is no long-run and short-run adjustments (causality) between spot and futures prices

H_0: There is a long-run and short-run adjustments (causality) between spot and futures prices.

Table 4.4							
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.043261	10.84271	15.49471	0.2213	10.43707	14.26460	0.1848
At most 1	0.001717	0.405632	3.841466	0.5242	0.405632	3.841466	0.5242

Trace test indicates no cointegration at the 0.05 level
*Denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Max-eigenvalue test indicates no cointegration at the 0.05 level

Table							
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.064672	19.33639	15.49471	0.0125	15.77859	14.26460	0.0286
most 1	0.014962	3.557806	3.841466	0.0593	3.557806	3.841466	0.0593

At
Trace test indicates no cointegration at the 0.05 level
*Denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Estimation of long-run and short-run adjustments (causality) between spot & futures prices Estimation of long run and short run adjustments between spot & futures

The t-statistics are given in [] brackets while the error term are given in () brackets .The coefficients of Chana future returns and castor seeds future returns are positive and statistically insignificant respectively, the results reveal that the relationship between Chana future returns and spot returns and castor seeds future returns and spot returns are positive. The sign of the error correction coefficient in determination of Chana spot returns is positive (0.01521),the t value is [0.91192]and f statistics is 2.354423 and castor seeds returns is positive 0.041934 ,the t value is [0.73464].And f statistics is 5.474049 This indicates that Chana and castor seeds spot returns do

not respond significantly to re-establish the equilibrium relationship once deviation occurs.

Presence of Short run Causality between futures and spot prices

H_0: There is no presence of short run causality between futures and spot prices.
H_a: There is presence of short run causality between futures and spot prices.

Since the probability value is more than 0.05, null hypothesis is accepted hence alternative hypothesis is rejected. The table reveals that results of Wald chi-square test that the joint value of all the coefficient of future prices of Chana and castor seeds at select lag length are not equal to zero ,which indicates the presence of the

short run causality between the spot and future market of commodities under study.

Direction of Causality–Granger Causality
H_0: There is no significant impact of commodity futures prices to spot prices
H_0: There is a significant impact of commodity futures prices to spot prices

Estimation of Direction of Causality-Granger Causality Estimation of Direction of Causality –Granger Causality

Table

Panel A : Normalized Co- integration Co-efficient

CHANNA(-1)	CHANNA1(-1)	CONSTANT
1.000000	-1.438321	1920.791
	(0.19532)	
	[-7.36378]	

Panel B : Coefficient of Error Correction Term

Error Correction:	D(CHANNA)	D(CHANNA1)
CointEq1	0.015214	0.096657
	(0.01668)	(0.02511)
	[0.91192]	[3.84893]
F-statistic	2.354423	3.919548

Standard errors in ( ) & t-statistics in [ ]

Table

Panel A : Normalized Co- integration Co-efficient

CASTOR(-1)	CASTOR1(-1)	CONSTANT
1.000000	-0.895942	-376.5728
	(0.04209)	
	[-21.2865]	

Panel B : Coefficient of Error Correction Term

Error Correction:	D(CASTOR)	D(CASTOR1)
CointEq1	0.041934	0.221188
	(0.05708)	(0.06194)
	[0.73464]	[3.57107]
F-statistic	5.474049	12.55270

The cointegration result indicates that causality exists between the cointegrated variables but it fails to show us the direction of the causal relationship .The pair wise Granger causality test is performed between all possible pairs of variables to determine the direction of causality .The results show that there are bidirectional causality exists only between castor future returns and castor spot returns.

Wald Test:
Equation: Untitled

Test Statistic	Value	Df	Probability
F-statistic	1.723210	(2, 234)	0.1807
Chi-square	3.446421	2	0.1785
Null Hypothesis: C(3)=C(4)=0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)	Value	Std. Err.	
C(3)	-0.082809	0.045552	
C(4)	0.079584	0.045157	

Restrictions are linear in coefficients.

Wald Test:
Equation: Untitled

Test Statistic	Value	Df	Probability
F-statistic	0.058046	(2, 234)	0.9436
Chi-square	0.116093	2	0.9436
Null Hypothesis: C(3)=C(4)=0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)	Value	Std. Err.	
C(3)	0.022544	0.076318	
C(4)	-0.009034	0.071519	

Restrictions are linear in coefficients.

Note: p values denote significance level at the 5% level of significance.

Null Hypothesis:	Obs	F-Statistic	Prob.	DECISION
D(CHANNA1) does not Granger Cause D(CHANNA)	238	2.72990	0.0673	Accept
D(CHANNA) does not Granger Cause D(CHANNA1)		1.24487	0.2899	Accept

Findings

1. The Johansen's co integration test reveals that there is a long run association that is equilibrium between spot and future prices of Chana and castor seeds.
2. The VECM results reveal that the co efficient of error correction term (coefficient of cointEq1) is positive in sign and is not significant. This implies that there

is a long run causality running from future prices to dependent spot prices which enable the spot market to adjust to the short run deviation from long run equilibrium path nearly 2.01% and 3.30% speed of adjustments in sample commodities ,that is ,Chana and castor seeds respectively .The speed of correction in the future market of Chana is 3.43%against spot market ,which indicates a highly informative future market .At the same time ,insignificant ECT of in future prices of castor seeds indicates futures market efficiency towards maintaining stable long run equilibrium.

3. Wald chi-square revels that the joint value of all the coefficient of future prices of Chana and castor seeds at select lag lengths are not equal to zero ,which indicates the presence of short run causality between the spot and future market of commodities under study ($p<0.05$).

4. Granger Causality tests disclosure that there is only a unidirectional causality from future returns to spot returns of commodities Chana and castor seeds ($p<0.05$).

Null Hypothesis:	Obs	F–Statistic	Prob.	DECISION
D(CASTOR1) does not Granger Cause D(CASTOR)	238	1.84703	0.1600	Accept
D(CASTOR) does not Granger Cause D(CASTOR1)		22.3142	1.E-09	Reject

CONCLUSION

The study was undertaken by the researcher to find out the efficiency of Commodity future in price discovery of agricultural commodities in India .It is Concluded that there is a long run association that is, equilibrium between Commodity spot and future prices of sample commodities. This indicates that There is no scope for long run arbitrage opportunity .The result of co integration In addition, VECM and granger causality test highlight that future market contributes largely to the price Discovery, suggesting that future market influence spot market in price discovery of Chana & castor seeds y .It is observed that the commodity futures are more effective in hedging in the case of Chana and Castor seeds .So it is revealed that the near month future contracts are suitable For hedging.

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Isolation and Identification of Endophytic Bacterial Strains Isolated from Andrographis paniculata and Tephrosia purpurea

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ABSTRACT

Ancient medication was solely depending upon ethano-botanical properties of medicinal plants and herbs in India. But, as the human civilization took a step ahead towards health-care practices then there is the need of organized information of bioactive compounds produced by plants that help them to treat particular health issue. Subsequently, scientifically proven pure form of bioactive compound came into picture for Specific health problems while earlier medicinal use of plant was generalized like one medicinal plant can cure wide range of health issue. Eight endophytic bacterial strains isolated from *Andrographis paniculata* and *Tephrosia purpurea* collected from Bilaspur District, Kota tehsil, Ratanpur town. Three from *Andrographis paniculata* Burm. F and five from *Tephrosia perpuria*. After morphological and biochemical tests, they are identified as genus of *Bacillus* sp., *Klesbsilla* sp., *Pseudomonas* sp., *Acinetobacter* sp., *Vibrio* sp., *Citrobacter* sp. And *Azotobacter* sp.

KEY WORDS: BIOACTIVE, ANDROGRAPHIS PANICULATA, TEPHROSIA PURPUREA.

INTRODUCTION

Now a day, purified form of naturally derived bioactive compounds along with certain kind of modification and in combination with one or more natural bioactive ingredients have widely used. Since 1956 plant derived bioactive compounds have been recognized and over seven thousand bioactive compounds added in the pharmacopoeia but among them only 120 bioactive compounds have been used in modern medication (Roy et al., 2016).

The endophytic bacteria, fungi, and actinomycetes thrive inside the plants communities and synthesize variety of bioactive compounds like phenols, alkaloids, flavonoids, steroids, terpenoids, polyketones, peptides, quinols (Li et al. 2008; Tiwari et al., 2013; Roy and Banerjee 2015; Liarzi et al. 2016; Salam et al., 2017). Endophytic bacteria have also been reported for their ability to produce antimicrobial agent (Yu et al., 2010; Zothanpuia et al., 2017), anticancer agent (Wei et al., 2015), plant growth promoting hormones (Glick 2012), phoSphate solubilization, nitrogen fixation and pesticides like azadirachtin (Kusari et al. 2012). The endophytic bacteria have pharmaceuticals, agricultural (Zinniel et al., 2002) and industrial applications (Hallmann et al. 1997; Kobayashi and Palumbo 2000; Zinniel et al. 2002).

Endophytic microbes smoothly live inside the plant tissues as symbiosis or mutualism and no harmful effect to the host plant have been documented to date (Rosenblueth and Romero, 2006; Lambers et al., 2008). Bacterial Species such as *Bacillus cereus* (Sunkar and Nachiyar, 2012), *Bacillus pumilus, Pseudomonas putida, Clavibacter michiganensis* (Kumar et al., 2016), *Pseudomonas* Sp. (Mercado and Bakker, 2007), streptomycetes Sp. (Li et al., 2008), *Arthrobacter* (Maggini et al., 2019), *Azorhizobium, Bradyrhizobium, Klebsiella, Enterobacter* and *Burkholderia* (Roy et al., 2016) have been document as common endophytic bacteria among medicinal plants. The present course of investigation has been done to evaluate the production of secondary metabolites by endophytic bacteria isolated from Medicinal plant inhabited in Bilaspur District of Chhattisgarh State.

MATERIAL AND METHODS

Sampling: Fresh and healthy plant of *Andrographis paniculata* and *Tephrosia purpurea* (Linn.) was collected from the Bilaspur District, Kota tehsil, Ratanpur town and brought to the laboratory.

Isolation of endophytic bacteria: Fresh stem and root part of the selected plant were used for the isolation of endophytic bacteria. For the isolation of endophytic bacteria, fresh stem and root part of the plant were surface sterilized. Plant parts were thoroughly washed with tap water, then soaked in 2% sodium hypochlorite containing 0.1% Tween-20 for 20 sec., later washed with 70% ethanol for two minutes, final wash was done with distilled water and allow them to dry. Afterward 1.0 g of each plant parts were crushed in distilled water using mortar and pestle separately. Crushed sample

(1.0 ml from each) was serially diluted using potassium phosphate buffer (pH-7.0). Aliquot (0.1 ml) of different dilutions were spreaded on Nutrient Agar Media (pH-7.0 ±2) for the isolation of endophytic bacteria and incubated at 30°C ±2) for 120 hours (Arunachalam and Gayathri, 2010).

Identification of Endophytic bacteria; Morphologically distinct colonies were marked out and their pure cultures were prepared on nutrient agar media and stored in refrigerator until used. Morphological and Biochemical characterization was done to identify endophytic genera as per described in Bergey's Manual of Determinative Bacteriology (1964).

RESULTS AND DISCUSSION

Present research work has been done to evaluate endophytic bacteria reside in Andrographis paniculata and *Tephrosia purpurea*. A total of eight endophytic bacterial strains isolated from *Andrographis paniculata* and *Tephrosia purpurea*. Three (EBI-7 to EBI-9) from *Andrographis paniculata* Burm. F and five (EBI-16 to EBI-20) from *Tephrosia perpuria* L. bacteria isolated from rarely found medicinal plant from Bilaspur district. *Tephrosia perpuria* L recorded (5.3 x 105cfu/g) number of shoot endophytes and (6.1 x 105 cfu/g) in roots. *Andrographis paniculata* Burm. f. recorded (2.8 x 105cfu/g) number of shoot endophytes and (3.6 x 105cfu/g) number of root endophytes (Table No.3). Among eight isolates EBI-9 is gram positive and EBI-7, EBI-8, EBI-16 to EBI-20 are gram negative Except EBI-7, all isolates were long rods, rods or short rods and EBI-7 was circular. The only one isolate EBI-9 formed endospores in broth media. Except EBI-8 and EBI-19 all other isolates are motile (Table No.1).

Table 1. Microscopic characteristics of isolated endophytic bacteria					
Isolates	Gram stain	Cell shape	Endospore	Motility	Tentative identification
EBI-7	-	Cocci or bacilli	-	+	*Acinetobacter* sp.
EBI-8	-	Short rods	-	-	*Klebsiella* sp.
EBI-9	+	Rods	+	+	*Bacillus* sp.
EBI-16	-	Rods or cocci	-	+	*Acinetobacter* sp.
EBI-17	-	rods	-	+	*Vibrio* sp.
EBI-18	-	Rods	-	+	*Pseudomonas* sp.
EBI-19	-	Short rods	-	-	*Klebsiella* sp.
EBI-20	-	Short rods	-	+	*Azotobacter chroococcum*
Note: EBI-Endophytic Bacteria isolates					

The diversity of the putative endophytic bacteria isolated from the hosts was assessed using phenotypic characterization methods in the present study. Colony morphology gave an indication of the variation among the endophytes. The isolates studied were chosen for their dominance as well as uniqueness or differences with others in colony morphology. The isolates EBI-7, EBI-8,

EBI-16 and EBI-19 tested negative for oxidase test, all the isolates except EBI-7 and EBI-16 could reduce nitrate, EBI-8, EBI-18 and EBI-19 did not produce hydrogen sulfide (Table No.2). The utilization of glucose, sucrose and lactose was studied using the fermentation broth with Durham's tube. All the isolates except the isolate EBI-12, EBI-15 and EBI-18 all isolates could ferment

glucose but EBI-8, EBI-16 and EBI-19 all isolates could not produce gas. All the isolates except the isolates EBI-9 and EBI-18 all isolates could ferment sucrose and except EBI-7 and EBI-16 all isolates could not produce gas. All the isolates except the isolate EBI-9, EBI-19 and EBI-20 all isolates could not ferment lactose and none of isolates could produce gas (Table No.3).

Table 2. Biochemical characteristics of endophytic bacteria								
Isolates	Oxidase test	Nitrate reduction	H$_2$S production	Catalase	Indole production	MR test	VP test	Citrate utilization
EBI-7	-	-	+	+	-	+	-	+
EBI-8	-	+	-	+	-	+	-	+
EBI-9	+	+	+	+	-	+	-	+
EBI-16	-	-	+	+	-	+	-	+
EBI-17	+	+	+	+	-	+	-	+
EBI-18	+	+	-	+	-	+	-	+
EBI-19	-	+	-	+	-	+	-	+
EBI-20	+	+	+	+	-	+	-	+

Note: EBI-Endophytic Bacteria isolates

Table 3. Carbohydrate fermentation test						
Isolates	Glucose		Sucrose		Lactose	
	Colour	Gas	Colour	Gas	Colour	Gas
EBI-7	+	-	+	+	-	-
EBI-8	+	+	+	-	-	-
EBI-9	+	-	-	-	+	-
EBI-16	+	+	+	+	-	-
EBI-17	+	-	+	-	-	-
EBI-18	-	-	-	-	-	-
EBI-19	+	+	+	-	+	-
EBI-20	+	-	+	-	+	-

Note: EBI-Endophytic Bacteria isolates

Table 4. Enzymatic test		
Isolates	Gelatinase	Urease
EBI-7	L-	+
EBI-8	L-	+
EBI-9	L-	-
EBI-16	L+	+
EBI-17	L+	-
EBI-18	L-	-
EBI-19	L-	+
EBI-20	L-	+

Note: EBI-Endophytic Bacteria isolates

The enzymatic activity of the endophytic bacterial isolates was studied in relation to gelatinase and urease. Endophytic bacteria EBI-16 only were able to produce gelatinase. Five of eight endophytic bacteria EBI-7, EBI-8, EBI-16, EBI-19 and EBI-20 were able to produce urease (Table No.4). Identification of endophytic bacterial strains was done on the genus level as described in Bergey's Manual of Determinative Bacteriology (1964). A total of seven bacterial strains namely *Bacillus* sp., *Klesbsilla* sp., *Pseudomonas* sp., *Acinetobacter* sp., *Vibrio* sp., *Citrobacter* sp. And *Azotobacter* sp. were identified. Identification of endophytic bacteria was done on genus level. *Acinetobacter* sp., *Bacillus* Sp., *Klesbsilla* Sp., *Pseudomonas* Sp., *Vibrio* Sp., *Azotobacter* Sp. were identified. Morphological and Biochemical characterization of eight endophytic bacterial strains were done and observed that except bacillus sp. All are gram negative, only bacillus sp. observed for endospore formation, *Acinetobacter* sp., *Klebsiella* sp., and *Bacillus* sp., shows motility (Table No. 1).

In an earlier work, Arunachalam and Gayathri (2010) studies endophytic bacteria from *Andrographis paniculata* to evaluate their antimicrobial profile against six human pathogenic bacteria and two fish pathogenic bacteria and got satisfactory. In an another study 24 endophytic bacteria were isolated from *Andrographis paniculata* and assessed for them to improve plant growth and observed 7.86 % in shoot and 10-120% in root growth (Gusmaini et al., 2013). Roy et al. (2016), isolated entophytic bacteria *Bacillus thuringiensis* from *Andrographis paniculata* Nees. Balamurugan and Prakash (2012) revealed that B. licheniformis and *K. pneumoniae* from *Tephrosia purpurea*, produces exo-polysaccharide (EPS) 210 mg/ml and 70.02 mg/ml respectively. However, very few literatures are available on the isolation of endophytic bacteria from Tephrosia purpurea.

CONCLUSION

Tephrosia purpurea and *Andrographis paniculata* is used in traditional medicines since many years. However, new

discoveries in this plant research leads to development and opening of many more areas to explore. The plant is now gaining importance to develop some more new research for the future development by understanding the gene level study. Therefore, considering its versatile medicinal uses, there is a scope for future research on *Tephrosia purpurea* and *Andrographis paniculata* and hence further pharmacological investigations are warranted. Endophytic bacteria are reported to enhance the growth of plant and may also increase the supply of nutrients to plants in turn helping in building the defense mechanism of plant. The present investigations were undertaken to find out the presence of bacterial endophytes in root and shoot tissue of this plant. By using nutrient agar eight endophytes were isolated and the characterization of these eight isolates showed that diverse species like *Bacillus* sp., *Klesbsilla* sp., *Pseudomonas* sp., *Acinetobacter* sp., *Vibrio* sp., *Citrobacter* sp. and *Azotobacter* sp. present as endophyte with both plants.

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Tools used for Distributed Agile Software Development

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ABSTRACT

The Agile software development is not just a framework for Scrum, Extreme Programming, or feature-driven development (FDD). The Agile software development is more than just practice, such as pairing Programming, Test-Driven Development, Standing, planning sessions, and sprints. The Agile software development is a general term for a set of frameworks and practices based on the values and principles expressed in the manifesto for agile software development and the 12 principles behind them. When you're dealing with software development in a particular way, it's usually good to base on these values and principles and use them to help figure out what to do right in a particular context. The communication barriers need to be overcome for creating an effective distributed agile team. Many distributed teams become unsuccessful as they work as if they are collocated and do not efficiently concentrate on the additional requirements they need to fulfill. In order to face the communication challenges, they need they make use of additional tools and practices and be committed for improving.

KEY WORDS: SOFTWARE, PROGRAMMING, STANDING, PLANNING SESSIONS.

INTRODUCTION

The Agile distributed software development methods uses the following practices to overcome the problems:

Improve Communication: A distributed team can only be successful if they find ways for bridging the communication gaps, Conference phone and projector can help for setting up a meeting across the locations. The complete team can interact easily using it, whether distributed or collocated. Video conferencing is much better option than voice conferencing. In order to work together remotely hands free headsets, web cams and application sharing software's can be used by the team members. For synchronous communication, instant messenger can be used. For asynchronous communication, e-mail can be an option. [1]

There has to be a change in the way the team members communicate. Usually the communication is informal (verbal) in collocated teams. The verbal communication has to be changed to formal (nonverbal) communication. The problem of non overlapping working hours can be solved by this approach. Communication can also be as an explicitly part of somebody else's duties on the team. By assigning a representative for a remote sub team to help to catch up with the missed hallway communication, this could be done. There needs to be a change in the meeting formats. As the issues which are related to the whole team only are discussed in the daily standup meetings, therefore these meetings may be overly long. The discussion of other issues may be after the meeting. In the meeting, only those team members must be present

who are involved in the project, the team members who are not involved can leave the room and get on to their work. [2].

Use Contact Visits: The Collocated project teams meeting for the first little iteration can do face-to-face communication. With the help of this, the team members know each other in a better way and build trusts and bonding. As many key decisions are taken at the beginning of the project, therefore face to face communication helps a lot. The Personnel bonds can be refreshed, when on periodic basis the whole team gets back together during the course of the project. The release and shipping of the final deliverable becomes much smoother by bringing the team together for the last couple of iterations.

Team Distribution: As the team is not available during the day due to significant time zone differences, it results in communication blackouts. In the time zone distribution, the workable hours shared by whole team is of three to four hours either in morning or afternoon hours for meetings, the best time used by the team is overlapping time. The team is distributed offshore and the time zone difference is large, in that case a team representative is hired who has worked with the distributed team and has a good understanding with them it will be represented as the core of the team and will be present at daily standup meetings. He will have vigorous discussions and meetings in the team room and will pass the results to the offshore team work can lead to exhaustion. [3]. Hubert Smiths has suggested in his article an alternative for coordinated office hours. Usage of nested scrum with multilevel reporting and multiple daily scrum meetings is suggested by him. The intention of all of these modifications is to assist teams regulate to new methods and projects and help reduce misunderstandings connecting different groups.

Focus on Team coaching: The challenges encountered by the distributed teams is more and they require more help to enable them to attach with the core practices engaged by agile teams. The key practices are discarded by many distributed teams as they seem to be too hard. One person from the team who can play the role of coach is very important in keeping the distributed team on the correct path. As it is important that a practice should be modified or replaced with something equivalent, thus many of the core Extreme Programming development practices serve to support each other. For example the pair programming may be amplified or replaced by code reviews and story cards might require whole information generally gained from conversations. To remind the team of the fundamental principles and assist them to adjust to the practices when the enticement might be to dispose of them is the role of the coach. [4]

Documentation: The distributed agile software development process can be improved if documentation of the complete project is done properly.For example if user stories are provided with use case diagrams in

worldwide reachable backlogs, it will help in reducing the misunderstandings and improve teamwork.

Background and Related Work

Use of tools: For formal/informal communication and project support, various tools have been suggested. If the whole team is not in the same room, then the agile teams cannot rely on sticky notes on a task board or a burn down chart on the wall for project tracking. The Likewise designs and diagrams need to be shared across multiple locations. The distributed team has to be provided with the tools it needs to maximize communication

The suggested tools categorized by their main function are given below:
Social networking tools
They facilitate group interactions which also include everything from email to video conferencing. [5]

- Communication tools: e-mails, instant messengers
- Software configuration management tools: repositories and description scheming tools.
- Bug and issue tracking databases: it gives information about the bugs found
- Knowledge centers: containing scientific references and frequently asked questions.
- Mutual development environments: Provide project workspaces and standardized work sets e.g. Essential solutions in distributed agile projects are project repositories and project management tools.
- Fowler says there are various ways to contain information, but among them wikis work well due to following reasons are given below.
- Simple to use
- Compatible with any browser
- Easy to set up.
- Its unstructured nature is its additional benefit
- As the project grows, own structures can be used by the team for keeping the information progress tracking during the iteration, some tools focus on documenting the outcomes of a planning meeting. The target of others is to support the actual planning meeting. This difference is unfortunately not highlighted in the relevant literature and marketing material.

In order to review the existing agile planning tools, first collection of candidate tools that are published online was done, which was mentioned by the interview participants (industrial agile developers) or described in the literature. Although reviewing of the tools showed some diversity, they could still be categorized by design goals, functionalities and supported platforms. The common features, advantages and limitations of existing agile planning tools are revealed by the categorization. [6] The Table 1 lists the basic categories and sample tools used in the study. Some tools are found sharing feature of more than one category.

Research Method: Out the tools available in the above table, I have focused on the Communication Tool used in Distributed projects by the different project managers

and their teams. I have taken information about it by personally meeting the CEO of an organization and gathering the desired information.

Table 1. Showing Category and sample tools

Category	Sample Tools
Wiki	MASE, PM Wiki, JSP Wiki, Media Wiki
Web-form based application	Rally, Version One, Scrum Works, XP Planner, Mingle
Board-based application	Card Meeting, Glue wiki, Agile Planner, MASE, Mingle, Danube
Plugins for IDE	IBM Jazz, Jira +Green Hopper, Project Cards
Synchronous agile planning tool	DAP, Card Meeting
Tabletop-based agile planning tool	APDT
Communication Tool	Skype for Business & WebEx Meeting with rich functionality Like screen share, remote screen control and recording the communication for Future references
Sprint & Product Charter tacking	Jira, Project Management Server.

Figure 1: Showing Skype for business
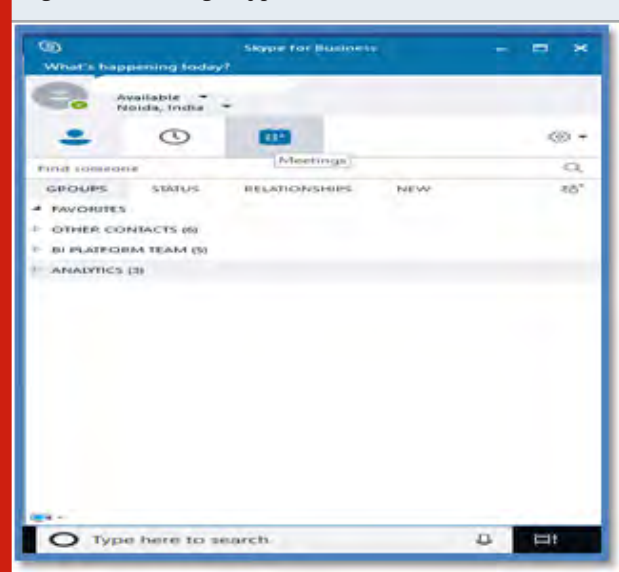
Communication Software Tool: Skype for Business

Sprint & Product Charter Tacking: The Jira web based tool is used in this product development for tracking

the sprint task and ongoing support on the released features of the product. All the Jira issues are segregated in different task group e. g. production support (Data Load issue, server issue etc), development based on sprint, ad- hock request and all these issue type having their own work flow.

Figure 2: Showing Sprint and Product Charter Tracking
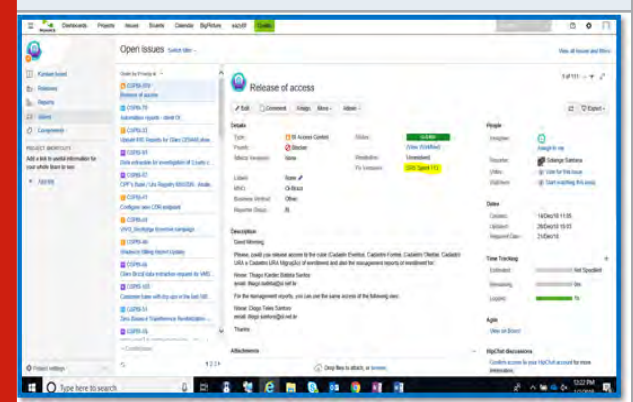
Figure 3: Showing Issue Type Scheme
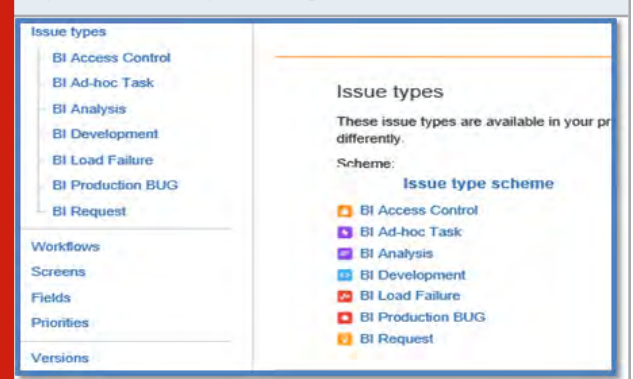
Figure 3: Showing Work Flow of BI Development
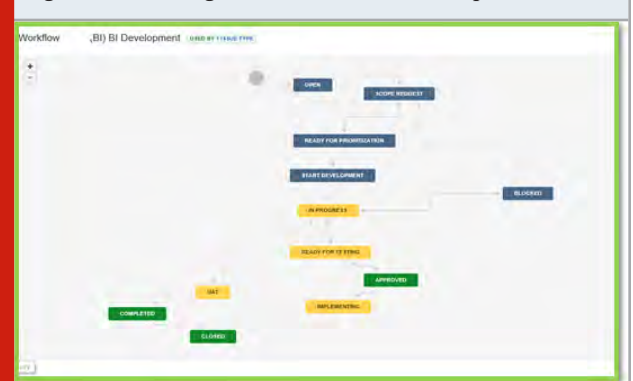
Issue Type: In Jira we have grouped the issue type as flowing category and all issue type are having their own workflow.

Work Flow: In Jira workflow can be defined on issue type and any new issue type created/ updated in back ground works get triggered.

Case Study of Nuance Communication Azure Big Data BI Platform

Product Detail: The Azure Big Data BI Platform is a Cloud based centralized Analytic and reporting product which fulfills all the all requirement of the different products line e. g. Mobile Communication, Auto relative and health care for multiple locations like India, Bangladesh, China, Brazil, U.K. and USA. The team members of this product are in all the location and working in centralized Azure Cloud Platform.

Figure 4: Showing Project Charter

Figure 5: Showing Sprint and Tracking
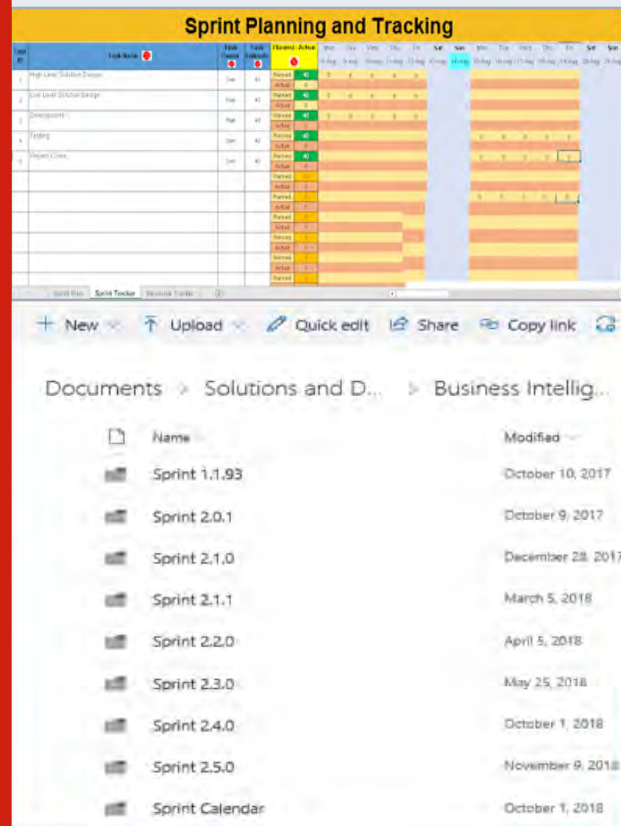
Figure 6: Showing Centralized Product Documentation
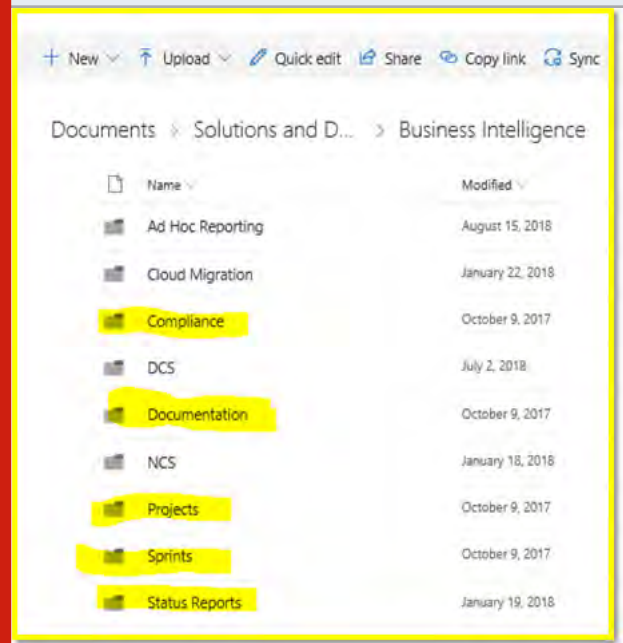
Figure 4.21: Showing Data Warehouse Architecture on Azure Cloud
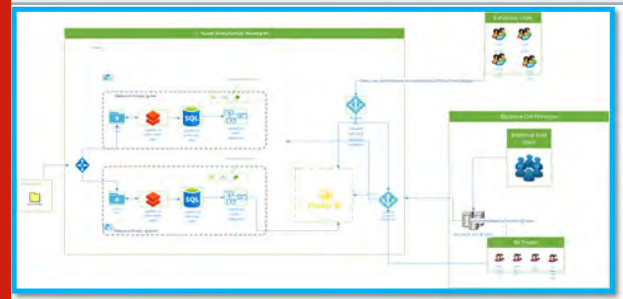
Team Members Communication: All team members are connected to each other by using Skype for Business for any immediate query/ questions. Based on the product line the team members are divided into sub groups to perform development and product feature release based on Product Charter and sprint meeting. Every day sub group of team members are having 10-minute standup meeting to provide the last status, to address any issues and next task to be taken of the day. This way all the team members get aware of the plan and know everyone's activities and dependency of each other. Based on the everyday stand-up meeting sprint gets updated. On weekly basis, all team members of all sub groups get connected for an hour and having consolidated weekly status updated and help each other on any technical, functional issues.

Project/Product Charter: All the features of the product are identified and defined in the product charter. All the features/functional specifications are mentioned in the product charter. In review meeting with the entire stakeholder the order of the features delivery is defined and then after the sprint is defined.

Sprint & Tracking: The Sprint planning and tracking is an important part of agile project management. The nature of this type of work is cyclical and effective. Once the team adapts to several sprint cycles, the time-saving nature of the process becomes apparent. Sprint is planned to be completed in the Sprint planning meeting, attended by Scrum Master, product owner and project team.

Centralized Product Documentation: All the product related documents are stored in SharePoint document library, where all the documents version controls are maintained. Once the new features of product are released, respective documents are updated. All the team members are having access based on the group policy. [7]

Architecture of Modern Data Warehouse on Azure Cloud

CONCLUSION

Put it to somebody context is a central concept in empirical software engineering research. In order to provide an in-depth understanding of what works for whom, where, when and why, empirical software engineering research should be "contextualized". The Empirical software engineering research can become sufficiently understandable through the perspective, understanding and assessment. The context of a research study, which depends on the research phenomena under scrutiny, must be articulated clearly, particularly on how contextual influences operate, in order to transfer evidence generated from one context to another. [8].

In this study, the project context which influences the strategies has been described in terms of the time overlap between sites, the number of sites of the distribution, size of the whole team, technical infrastructure for communication and collaboration, and criticality of the projects. Our purpose to make available distributed teams with ample explanation on how circumstance impacts the acceptance of the strategies may contribute to the successful uptake of research into practice. The tools and technologies that support distributed development, improve teamwork between dissimilar team members or computerize as much of the work as likely significantly contribute to the success of scaling Agile.

Its make clear how distributed teams used tools for communication and association in order to manage the product backlog and sprint backlog, to share project information and documentation, and to facilitate the software development process. The distributed teams that use Scrum requires an extensive range of tool support for communication, teamwork, project management, issue checking, bug checking or managing backlogs. [9] The Proactive resource management practice helps to ensure that Agile teams have the essential technical infrastructure and tools to support scrum practices in global software development. It was found in our study that distributed teams in Agile software development depend broadly on technology for communication and collaboration.[10]

The Communication tools were used for daily scrum and collaboration tools were used for e-collaboration on a daily basis. Access to appropriate technical infrastructure thus in a straight line influences the acceptance of the strategies, such as the same time strategy which promotes synchronous communication and real-time collaboration across different sites. [11].

During field observations, we noticed our participants were using different tools in their projects. Though some team was using the free, open source tools available online, we found many teams were using vendors' products, mostly for reliability, support and completeness. The Agile methods in general focus on small, co-located teams, in which customers are an integral of part of the teams, and importance on testing before coding and frequent feedback into updated requirements .[12] The Argue it is unsurprising that projects in the "sweet spot" benefit from the use of Agile methods such as Scrum and XP.

In practice, many projects are not a part of the Agile "sweet spot": projects with a large number of team members, projects with distributed teams or projects with inadequate customer collaboration. The development methods and practices must be adapted to fit their projects' contexts. Understanding the background of agility is significant for other agile teams to become accustomed with development processes to fit their projects contexts . Hence, we have described in detail the context of projects investigated in this study, and in particular the circumstances that impact the adoption of the strategies.[13]

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Women Empowerment through specified Public Services in South 24 Parganas District of West Bengal: Not Devoid of the Role of Public Library

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ABSTRACT

Women play a critical role in the family which is the basic unit of a civilized society. The purpose of conducting this study was to assess the factors in which students of Bhangar –I block in the district of South 24 Parganas of West Bengal acquired knowledge, practice and was influenced by public services through public libraries in Bhangar- I Block. Kanyashree Prakalpa is an initiative of the West Bengal government aimed at improving the lives and conditions of young girls, improving their education, preventing child marriage and achieving economic status. The programme aims at reducing child labor or dropouts, violence against women, eliminate illiteracy, child marriage, and promote economic activities for economically weak students. The public library is the local centre of information, making all kinds of knowledge and information readily available to its users. The services of the public libraries are provided on the basis of equal access for all, regardless of age, race, sex, religion, nationality, language or social status. Public Library disseminates information for empowering the women. This study has shown that almost all variables play powerful roles in finding public libraries' activities to enhance women development through specified public services of Bhangar- I Community Development Block in South 24 Parganas District of West Bengal. The findings are used in various public services to empower women.

KEY WORDS: WOMEN EMPOWERMENT, WOMEN EDUCATION, PUBLIC LIBRARIES, KANYASHREE PRAKALPA, CHILD MARRIAGE, DROPOUT, REGRESSION EFFECT ETC.

INTRODUCTION

Empowerment enables individuals to reach their full potential, improve their political and social participation, and inculcate a deep belief in the same as well as their ability. Women's empowerment is particularly difficult to achieve within a generation, as it depends not only on information about choices, but also on their acceptability. Unless women can help themselves, it is impossible to empower women. There is a need to develop regulations that reduce feminization of poverty, promote education for women, and prevent and eliminate violence against women.

Kanyashree Prakalpa, launched by Government of West Bengal is a Conditional Cash Transfer (CCT) Scheme that concentrates on girls currently at-a-high-risk of dropping out of school and the evil effects of child marriage. These are mainly within adolescents between the ages of 13 and 18.The CCT component of the scheme is supported by a multipronged communication strategy addressing

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key stakeholders' attitudes and practices towards female adolescents in families and communities and other stakeholders, including state and district administrators implementing the scheme. The scheme contains mainly three benefit components. The first is a cash benefit to be paid annually Rs.750/- (K1) to the girl students between 13 and 18 years of age from or above the 8th standard in a formal school, madrassah or equivalent open school course for every year so that they remain in education, provided they are unmarried at the time.

The second benefit is a one-time grant of Rs. 25000/- (K2) to be paid after a girl between the age of 18 and 19, provided that she is enrolled in an educational institution and is unmarried. The third benefit is Kanyashree girls, whether single or married can receive financial assistance from Kanyashree Prakalpa (K3) while studying postgraduate degrees in West Bengal, provided that these girls have scored at least 45% in graduation and pursuing a postgraduate degree in the Arts, Commerce or Science. Beneficiaries will be paid a grant of Rs 2,000 for Arts and Commerce and Rs. 2500 per month for Science . Thus Kanyashree Prakalpa scheme is a gateway of empowerment of girl students in West Bengal.

The IFLA/ UNESCO Public Library Manifesto 1994 elaborates the significance of public libraries as "the local gateway to knowledge, providing a basic condition for lifelong learning, independent decision- making and cultural development of the individual and social groups", and further stated impact of public libraries for education and society as " a living force for education, cultural and information, and as an essential agent for fostering of peace and spiritual welfare through the minds of men and women".

In Bhangar- I Community Development Block Public Library provides various types of information such as educational, commercial or amusement purposes. These types of information are very essential to the female students regarding their empowerment. Ugwoke and Omekwu (2014) stated in their study about the role of culture in the development of a society. It has discussed some of the ways the cultures of different Nigerian ethnic groups have been negatively influenced; and the problems hindering public libraries in the country from performing their cultural functions creditably .

Bushra and Wajiha (2015) found in their study, to explore the determinants that have an influence on women empowerment in Pakistan. The content of education, economic participation of women, poverty and economic opportunity available for women increases their empowerment. Pratley (2016) found in a study the conceptual challenges to measuring women's empowerment and its associations with maternal and health outcomes. Women's agency, autonomy, empowerment and status, different terms, related concepts. of measurement of women's empowerment continue to vary widely between individual studies and comparison between studies remains problematic.

In the study of Mello and Schmink (2017) it reveals the effects on rural women's empowerment of participation in collective microenterprises: access and decision-making power for land use, as well as on changes in their resource management practices. Women's economic empowerment contributed to their strengthened capacity for adaptive governance in the household due to improvements in their awareness of environmental issues and practices used to manage forest resources; and greater access to resources and to decision-making power about land use.

In the study of LaFever (2017) it is revealed that, how a group of contemporary nuns is utilizing and redefining their situated empowerment within their religious community and beyond. It explores what empowerment opportunities and challenges they face as twenty-first century nuns, and how their roles and identities as Buddhist nuns are evolving in increasingly empowering ways.

Bonilla et al. (2017) pay attention to aspects of their study 1.To provide contextual information regarding gendered decision-making norms within the evaluation sample 2.To triangulate findings from the quantitative evaluation 3.To provides critique and reflection on the use of decision-making indicators, as included in the quantitative evaluation, as a proxy for women's empowerment. And empowerment dynamics are likely to vary significantly from populations in other geographic regions, particularly those with markedly different gender norms. Paudel and Araujo (2017) found in their study the reported behavioural change in resources distribution among individuals through a series of decision-making questions involving household purchases, visits to family and friends and use of husband's earnings. The violence against women strengthened and women's autonomy in decision making increased significantly after the abolition of the monarchy.

Ghara and Roy (2017) revealed in their study that Kanyashree Prakalpa not only minimizes the tendency of girl students to drop out from schools at an early age, but also creates a positive impact on the prevention of early marriage of a girl child. All the districts of the state are found not to perform with equal effectiveness nor are they found to be consistent over time. The far-away districts are more serious in implementing the Prakalpa in comparison to the nearby districts. Best performing districts are Darjeeling & Siliguri and less attentive districts seem to be North & South 24 Parganas along with Murshidabad. The reasons are neither gender ratio nor sex ratio.

In a study by Schuler and Nazneen (2018), found that 1. The social processes underlying a decline in rates of Intimate Partner Violence (IPV) during 2002–14. 2. To better understand the ambivalent findings in the literature regarding the relationship between women's empowerment and IPV. 3. To explore changes in the nature of women's empowerment that may explain a

recent quantitative finding suggesting that women's empowerment has evolved from a risk factor for IPV to a protective factor. And the relationship between women's empowerment and IPV may reflect contextual differences in the degree to which women's empowerment is seen as transgressive versus normal across settings and time .

Mir (2018) found in his study that the impact of Kanyashree scheme is very deep-rooted in the society of West Bengal .It has become a boon for adolescent girls of West Bengal and also for Didi (politically). According to Mamata Benerjee Kanyashree became "BISWASHREE". She is not just happy with the impact of Kanyashree, she feels proud for her brain child. Being inspired with the result of Kanyashree, she has now declared another scheme: "RUPOSHREE". In this scheme every Kanyashree girl will get a one-time of Rs.25000 at the time of their marriage. Flavin (2019) found in his study that spending of public goods can have important implications for the well-being of Americans and, more broadly, contribute to the growing literature on how Government policy decisions concretely impact the quality of life that citizens experience.

While studying the perception of students towards women empowerment: role of public libraries of Beldanga-II community development block of Murshidabad district of West Bengal, Biswas and Deb (2020) found that effectiveness of Kanyashree one time grant, availability of public library, use of public library, role of public libraries towards public services, role of public libraries towards women empowerment, role of public libraries towards job related training, role of public libraries towards kind of information and kind of books uses of School or College library, had strong bearing on perception level of students' role of public libraries in getting information towards women empowerment.

Objective of the study
General objectives: The aim of the study was to determine students' perceptions and attitudes towards public libraries and the framework for empowering women in the Bhangar-I community development Block of 24 South Parganas District, West Bengal. The study also explores factors that influence the acceptability, accessibility, and exploitation of women's education through different public services activities.

Specific Objectives of the Study
• To identify the trends in dropout rates for girls in the study area after receiving basic education.
• Identify the interrelationships between female dropouts, poverty and child marriage in the study area.

Scope of the Study: The scope of this study is to frame students' views and attitudes towards public libraries and women's empowerment in the Bhangar-I community development block in South 24 Parganas District, West Bengal.

MATERIAL AND METHODS

This study is based on a rigorous household survey conducted at the Bhangar-I Community Development Block, South 24 Parganas district, West Bengal from February, 2019 to March, 2019. With the help of the random sampling method 100 students are chosen who received a one-time grant of Rs. 25000 from Kanyashree. A structured schedule containing 31 different questions / statements / opinions were placed in front of each student. The study also interviewed to measure their education status, the age of the interviewees, the occupation of the parents, etc. Here, to explore this issue, we used different statistical methods such as correlation, regression, and step down regression with the help of SPSS 2.0 version.

Measures
Outcomes: Outcomes of the present analysis are of three steps. First one analysis determines effectiveness of Kanyashree one-time grant (Y), is expressed from 17 independent variables such as Educational status (X2), Age of the respondent (X3), Occupation of parents (X4), Monthly income of parents (X5), Monthly income of family (X6), Go to regular school or College (X7), Availability of food during school /college hour (X8), Electricity at home (X9), Availability of Aadhaar card (X10), The school's or college's distance from your home (X11), How you go to school or college (X12), Accessibility of private tuition (X13), Effectiveness of Kanyashree grant for dropout girls (X14), Family consent for studying in school or college (X15), Role of Schools in getting Kanyashree grant (X16), Role of Gram Panchayat in getting Kanyashree grant (X30) and Role of Block Development Office in getting public services (X31).

The second one analysis the perception level of students on women empowerment (Z) from different independent variables such as educational status (X2), age of the respondent (X3), occupation of parents (X4), monthly income of parents (X5), monthly income of family (X6), go to regular school or College (X7), availability of food during school /college hour (X8), electricity at home (X9), availability of Aadhaar card (X10), the school's or college's distance from your home (X11), how you go to school or college (X12), accessibility of private tuition (X13), effectiveness of Kanyashree grant for dropout girls (X14), family consent for studying in school or college (X15), role of Schools in getting Kanyashree grant (X16), role of Gram Panchayat in getting Kanyashree grant (X30), role of Block Development Office in getting public services (X31), effectiveness of Kanyashree one time grant (X1), impact of women empowerment (X17), public services will help the women empowerment (X19), encourage about job related work (X20), role of public libraries towards women empowerment (X24) and role of public libraries in getting information towards women empowerment (X26).

The third one analysis the perception level of students role of public libraries in getting information towards women empowerment (W) from different independent variables

like effectiveness of Kanyashree one time grant (X1), impact of women empowerment (X17), public services will help the women empowerment (X19), encourage about job related work (X20), the perception level of students on women empowerment (X18), availability of public library (X21), use of public library (X22), role of public libraries towards public services (X23), role of public libraries towards women empowerment (X24), role of public libraries towards job related training (X25), role of public libraries towards kind of information (X27), uses of school or college library (X28), and kind of books uses of school or college library (X29).

Analysis

Table 1. Correlation Analysis between dependent variable effectiveness of Kanyashree one time grant (Y) and 17 casual variables

Variables	'r' Value
Educational status (X_2)	0.0382
Age of the respondent (X_2)	-0.0592
Occupation of parents (X_4)	-0.4414**
Monthly income of parents (X_5)	-0.4648**
Monthly income of family (X_6)	-0.4077**
Go to regular school or College (X_7)	0.3068**
Availability of food during school /college hour (X_8)	0.2737**
Electricity at home (X_9)	-0.6295**
Availability of Aadhaar card (X_{10})	-0.5120**
The school's or college's distance from your home (X_{11})	-0.4876**
How you go to school or college (X_{12})	-0.5009**
Accessibility of private tuition (X_{13})	-0.5160**
Effectiveness of Kanyashree grant for dropout girls (X_{14})	0.5362**
Family consent for studying in school or college (X_{15})	-0.4059**
Role of Schools in getting Kanyashree grant (X_{16})	0.4357**
Role of Gram Panchayat in getting Kanyashree grant (X_{30})	0.0049
Role of Block Development Office in getting public services (X_{31})	-0.1799

Critical value (2-Tail, 0.05) = +or- 0.197 *Significant at 5% level
Critical value (2-Tail, 0.01) = +or- 0.256 ** Significant at 1% level

Table I describes the students perception on the effectiveness of Kanyashree one time grant (Y) from 17 independent variables such as Educational status (X2), Age of the respondent (X3), Occupation of parents (X4), Monthly income of parents (X5), Monthly income of family (X6), Go to regular school or College (X7), Availability of food during school /college hour (X8), Electricity at home (X9), Availability of Aadhaar card (X10), The school's or college's distance from your home (X11), How you go to school or college (X12), Accessibility of private tuition (X13), Effectiveness of Kanyashree grant for dropout girls (X14), Family consent for studying in school or college (X15), Role of Schools in getting Kanyashree grant (X16), Role of Gram Panchayat in getting Kanyashree grant (X30) and Role of Block Development Office in getting public services (X31) had applied a significant impact on the dependent variable that is, on the level of perception about the effectiveness of Kanyashree one time grant.

In these regions where the female literacy rates are low, parent's role in understanding Occupation of parents (X4), Monthly income of parents (X5) and Monthly income of family (X6) is important. Because children's parents are the key figures in family income, children do not receive family support in understanding empowerment, and the role of parents has a negative impact on the level of perception about the effectiveness of Kanyashree one time grant. Most students in the village are first-generation learners and she will be more interested in learning.

The variables like Go to regular school or College (X7), Availability of food during school /college hour (X8) had strong positive impact on the level of perception about the effectiveness of Kanyashree one time grant. Schools and Colleges play a great role to disseminate lots of information regarding how to get Kanyashree, Shikshashree, Sabujsathi, Yobuhree and other schemes offered by the West Bengal Government to the students. On the other hand Kanyashree Prakalpa helps to reduce school drop-out rate.

That is why the variables such as effectiveness of Kanyashree grant for dropout girls (X14) and role of Schools in getting Kanyashree grant (X16) have strong

positive impact on the level of perception about the effectiveness of Kanyashree one time grant. The variables such as electricity at home (X9), availability of Aadhaar card (X10), the school's or college's distance from your home (X11) had strong negative impact on the level of perception about the effectiveness of Kanyashree one time grant. The student goes to School or colleges in different ways. The student goes to their institutions by walking, someone by cycle, someone by bus or auto etc. Here the variable 'How you go to school or college (X12)' had strong negative impact on the level of perception about the effectiveness of Kanyashree one time grant.

Table 2: Multiple Regression Analysis		
Variables	"β" value	"t" value
Educational status (X_2)	-0.037696	-0.521
Age of the respondent (X_3)	-0.060854	-0.832
Occupation of parents (X_4)	0.088614	0.459
Monthly income of parents (X_5)	-1.602339	-5.113**
Monthly income of family (X_6)	1.126162	4.207**
Go to regular school or College (X_7)	-1.109987	-3.364**
Availability of food during school /college hour (X_8)	0.897745	2.732**
Electricity at home (X_9)	-1.555862	-2.994**
Availability of Aadhaar card (X_{10})	0.038468	0.146
The school's or college's distance from your home (X_{11})	5.105009	5.664**
How you go to school or college (X_{12})	-3.993795	-5.959**
Accessibility of private tuition (X_{14})	1.252747	3.221**
Effectiveness of Kanyashree grant for dropout girls (X_{14})	1.181658	1.973
Family consent for studying in school or college (X_{15})	-1.008899	-4.683**
Role of Schools in getting Kanyashree grant (X_{16})	-0.792481	-1.975
Role of Gram Panchayat in getting Kanyashree grant (X_{30})	0.039353	0.618
Role of Block Development Office in getting public services (X31)	-0.157560	-2.411*

Critical value (2-Tail, 0.05) = +or- 1.989   *Significant at 5% level
Critical value (2-Tail, 0.01) = +or- 2.637   ** Significant at 1% level

Multiple R   = 0.83940
R Square   = 0.70460
Adjusted R Square   = 0.64335
Standard Error   = 0.73203

Analysis of Variance	DF	Sum of Squares	Mean Square
Regression	17	104.80868	6.16522
Residual	82	43.94132	0.53587

F =   11.50507   Signif F = 0.0000

As Bhangar- I C.D Block belongs from minority sections and most of the parents are related with cultivation and worker section. That's why most of the students belong from poor family. The parents did not afford private tuition for their child. As they are poor the parents did not take care for their children's education properly. Therefore the variables such as accessibility of private tuition (X13) and family consent for studying in school or college (X15) had strong negative bearing on the level of perception about the effectiveness of Kanyashree one time grant.

It is found from Table II that all seventeen (17) variables show their regression effects with β and corresponding t values, their effectiveness on Kanyashree one-time grant (Y), and they explain 70.46 per cent of the total aggregation effect (R^2 = 0.70460). Ten variables were identified in turn, such as monthly income of parents (X5), monthly income of family (X6), go to regular school or College (X7), availability of food during school /college hour (X8), electricity at home (X9), the school's or college's distance from your home (X11), how you go to school or college (X12), accessibility of private tuition (X13), family consent for studying in school or college (X15) and role of Block Development Office in getting public services (X31) which are the most important and explains the effect of total regression on predictors.

From the variables in Table III to the regression model of regression analysis, it is found that after step 5, five

variables are the Electricity at home (X9), Role of Schools in getting Kanyashree grant (X16), Monthly income of family (X6), Availability of food during school /college hour (X8) and Monthly income of parents (X5) had explained 53.19 per cent of the total effect. Therefore, the remaining 12 variables explain only about 17.27 percent of the total effect. Interestingly, in the step down model, the role of students in understanding age has innovatively increased to characterize the aggregate effect of these variables on the level of perception about the effectiveness of Kanyashree one time grant.

Table 3. Step-down Regression Model	
Step I: X_9	
Multiple R	= 0.62948
R Square	= 0.39625
Adjusted R Square	= 0.39009
Standard Error	= 0.95729
Step II: X_{16}	
Multiple R	= 0.66871
R Square	= 0.44717
Adjusted R Square	= 0.43577
Standard Error	= 0.92074
Step III: X_6	
Multiple R	= 0.68570
R Square	= 0.47019
Adjusted R Square	= 0.45363
Standard Error	= 0.90606
Step IV: X_8	
Multiple R	= 0.70852
R Square	= 0.50199
Adjusted R Square	= 0.48103
Standard Error	= 0.88305
Step V: X_5	
Multiple R	= 0.72932
R Square	= 0.53191
Adjusted R Square	= 0.50701
Standard Error	= 0.86066

Table IV describes the perception level of students on women empowerment (Z) from 23 causal factors, such as educational status (X2), age of the respondent (X3), occupation of parents (X4), monthly income of parents (X5), monthly income of family (X6), go to regular school or College (X7), availability of food during school /college hour (X8), electricity at home (X9), availability of Aadhaar card (X10), the school's or college's distance from your home (X11), how you go to school or college (X12), accessibility of private tuition (X13), effectiveness of Kanyashree grant for dropout girls (X14), family consent for studying in school or college (X15), role of Schools in getting Kanyashree grant (X16), role of Gram Panchayat in getting Kanyashree grant (X30), role

of Block Development Office in getting public services (X31), effectiveness of Kanyashree one time grant (X1), impact of women empowerment (X17), public services will help the women empowerment (X19), encourage about job related work (X20), role of public libraries towards women empowerment (X24) and role of public libraries in getting information towards women empowerment (X26). Education is only the way for the empowerment of women because women face lots of barrier like illiteracy, domestic violence and lack of motivation.

Higher education not only helps women acquire knowledge, but also enables them to make a living. Money is necessary to sustain life, and education helps to sustain life. Educated women play an important role in the family, dealing with both family health care and financial support. And the income of parents plays the key role of their children's education. Here, occupation of parents (X4), monthly income of parents (X5) and monthly income of family (X6) had a strong positive impact on the perception level of students on women empowerment.

Electricity is an essential element in our day to day life. Here the variable electricity at home (X9) had a strong positive bearing on the perception level of students on women empowerment. Aadhaar is a personal identification number issued to individuals by the Indian Unique Identification Agency (UIDAI) on behalf of the Indian government in order to determine the unique identity of each person. The Aadhar number will serve as proof of identity and residence anywhere in India. Here, availability of Aadhaar card (X10) had a strong positive bearing on the perception level of students on women empowerment.

Private home tuition can help students with personalized one-to-one attention and customized learning programs, especially for their weaker subject areas. Personal tutors will be able to quickly identify difficult topics or topics facing students. Here, accessibility of private tuition (X13) had a negative impact on the perception level of students on women empowerment. And the other variables such as the school's or college's distance from your home (X11), how you go to school or college (X12), family consent for studying in school or college (X15), impact of women empowerment (X17) and public services will help the women empowerment (X19) had a strong positive bearing on the perception level of students on women empowerment. Some variables like go to regular school or College (X7), availability of food during school /college hour (X8), effectiveness of Kanyashree grant for dropout girls (X14), role of Schools in getting Kanyashree grant (X16), effectiveness of Kanyashree one time grant (X1) and encourage about job related work (X20) had a strong negative bearing on the perception level of students on women empowerment.

It is found from Table V that all twenty three (23) variables show their regression effects with β and corresponding t values, their perception level of students

on women empowerment (Z), and they explain 77.22 per cent of the total aggregation effect (R2 = 0.77224). Four variables were identified in turn, such as age of the respondent (X3), occupation of parents (X4), role of

Schools in getting Kanyashree grant (X16) and public services will help the women empowerment (X19) which are the most important and explains the effect of total regression on predictors.

Table 4. Correlation Analysis between dependent variable the perception level of students on women empowerment (Z) and 23 casual variables	
Variables	**r' Value**
Educational status (X_2)	-0.0639
Age of the respondent (X_3)	-0.1199
Occupation of parents (X_4)	0.6079**
Monthly income of parents (X_5)	0.5519**
Monthly income of family (X_6)	0.5480**
Go to regular school or College (X_7)	-0.5978**
Availability of food during school /college hour (X_8)	-0.5518**
Electricity at home (X_9)	0.7588**
Availability of Aadhaar card (X_{10})	0.7740**
The school's or college's distance from your home (X_{11})	0.6828**
How you go to school or college (X_{12})	0.6793**
Accessibility of private tuition (X_{13})	0.7172**
Effectiveness of Kanyashree grant for dropout girls (X_{14})	-0.7304**
Family consent for studying in school or college (X_{15})	0.6357**
Role of Schools in getting Kanyashree grant (X_{16})	-0.7401**
Role of Gram Panchayat in getting Kanyashree grant (X_{30})	0.0895
Role of Block Development Office in getting public services (X_{31})	0.0443
Effectiveness of Kanyashree one time grant ($_{X1}$)	-0.4476**
Impact of women empowerment (X_{17})	0.4349**
Public services will help the women empowerment (X_{19})	0.7487**
Encourage about job related work (X_{20})	-0.7842**
Role of public libraries towards women empowerment (X_{24})	0.0958
Role of public libraries in getting information towards women empowerment (X_{26})	0.0854
Critical value (2-Tail, 0.05) = +or- 0.197 *Significant at 5% level	
Critical value (2-Tail, 0.01) = +or- 0.256 ** Significant at 1% level	

Table VI presents the step down regression model was applied to separate the prominent independent variables, then it was found that after step 3, three variables are encourage about job related work (X20), availability of Aadhaar card (X10) and age of the respondent (X3) had explained 69.65 per cent of the total effect. Therefore, the remaining 20 variables explain only about 7.57 per cent of the total effect on the perception level of students on women empowerment.

Table VII describes the students' views on the role of public libraries in women's empowerment (W) from 13 consequent variables such as effectiveness of Kanyashree one time grant (X1), impact of women empowerment (X17), public services will help the women empowerment

(X19), encourage about job related work (X20), the perception level of students on women empowerment (X18), availability of public library (X21), use of public library (X22), role of public libraries towards public services (X23), role of public libraries towards women empowerment (X24), role of public libraries towards job related training (X25), role of public libraries towards kind of information (X27), uses of school or college library (X28), and kind of books uses of school or college library (X29).

The roles of public services have a great responsibility for empowering the women through the different activities of Public Libraries. Availability of public library (X21) acts a great role in women's lives because it disseminates

information to empower women. This will help their own development, family and community development. In this sense, the use of public library (X22), Role of public libraries towards public services (X23), role of public libraries towards women empowerment (X24), role of public libraries towards job related training (X25) and role of public libraries towards kind of information (X27) had strong positive impact on the perception level of student's role of public libraries in getting information towards women empowerment.

Table 5: Multiple Regression Analysis		
Variables	"β" value	"t" value
Educational status (X_2)	0.048094	0.672
Age of the respondent (X_3)	-0.187439	-2.771**
Occupation of parents (X_4)	-1.219110	-2.416*
Monthly income of parents (X_5)	-1.553559	-1.873
Monthly income of family (X_6)	0.751093	1.409
Go to regular school or College (X_7)	-1.943500	-1.632
Availability of food during school /college hour (X_8)	0.292426	0.550
Electricity at home (X_9)	-0.702081	-0.957
Availability of Aadhaar card (X_{10})	-0.416503	-0.331
The school's or college's distance from your home (X_{11})	0.830315	0.563
How you go to school or college (X_{12})	-0.711274	-0.789
Accessibility of private tuition (X_{13})	1.002668	1.798
Effectiveness of Kanyashree grant for dropout girls (X_{14})	-0.875053	-0.675
Family consent for studying in school or college (X_{15})	-0.194564	-0.523
Role of Schools in getting Kanyashree grant (X_{16})	2.299041	2.752**
Role of Gram Panchayat in getting Kanyashree grant (X_{30})	0.024693	0.402
Role of Block Development Office in getting public services (X_{31})	-0.060868	-0.934
Effectiveness of Kanyashree one time grant (X_1)	0.047485	0.432
Impact of women empowerment (X_{17})	1.407446	1.596
Public services will help the women empowerment (X_{19})	1.360335	2.715**
Encourage about job related work (X_{20})	-0.718365	-0.566
Role of public libraries towards women empowerment (X_{24})	0.127990	1.308
Role of public libraries in getting		
Information towards women empowerment (X_{26})	-0.079749	-0.807

Critical value (2-Tail, 0.05) = +or- 1.991   *Significant at 5% level
Critical value (2-Tail, 0.01) = +or- 2.642   ** Significant at 1% level
Multiple R   = 0.87877
R Square   = 0.77224
Adjusted R Square   = 0.70332
Standard Error   = 0.45023
Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	23	52.23459	2.27107
Residual	76	15.40541	0.20270

F =   11.20394   Signif F = .0000

It is found from Table VIII that all thirteen (13) variables show their regression effects with β and corresponding t values, their perception level of student's role of public libraries in getting information towards women empowerment (W), and they explain 90.79 per cent of the total aggregation effect (R2 = 0.90793). Three variables were identified in turn, such as availability of public library (X21), role of public libraries towards job related training (X25) and role of public libraries towards kind of information (X27) which are the most important and explain the effect of total regression on predictors.

Table 6. Step-down Regression Model	
Step I: X20	
Multiple R	= 0.78417
R Square	= 0.61493
Adjusted R Square	= 0.61100
Standard Error	= 0.51554
Step II: X10	
Multiple R	= 0.82342
R Square	= 0.67803
Adjusted R Square	= 0.67139
Standard Error	= 0.47383
Step III: X3	
Multiple R	= 0.83458
R Square	= 0.69652
Adjusted R Square	= 0.68704
Standard Error	= 0.46241

Table IX presents the step down regression model was applied to separate the prominent independent variables, then it was found that after step 4, four variables are Role of public libraries towards job related training (X25), Availability of public library (X21), Role of public libraries towards kind of information (X27) and Role of public libraries towards women empowerment (X24) had explained 89.85per cent of the total effect. Therefore, the remaining 9 variables explain only about 0.94 per cent of the total effect on the perception level of student's role of public libraries in getting information towards women empowerment.

RESULT AND DISCUSSION

Throughout the dimension of the level of perception of students who have ever received Kanyashree one-time grant of Rs. 25,000 after turning 18, it was revealed that the variables such as going regularly to school or College (X7), availability of food during school /college hour (X8), effectiveness of Kanyashree grant for dropout girls (X14) and role of Schools in getting Kanyashree grant (X16) had strong Positive impact the level of perception about the effectiveness of Kanyashree one time grant. And the variables such as occupation of parents (X4), monthly income of parents (X5), monthly income of family (X6), electricity at home (X9), availability of Aadhaar card (X10), the school's or college's distance from your home (X11), how you go to school or college (X12), accessibility of private tuition (X13) and family consent for studying in school or college (X15) had strong negative bearing on the level of perception of Kanyashree one time grant. On February 12, 2015 the news e-paper 'Live mint' published a report that Headmaster of Arijullapur Siddiqa High Madrasah of North 24 Parganas Abu Tahir Md Mustafa said, "It has been possible to make one-fourth of the population, especially girls, school-bound.

Table 8. Correlation Analysis between dependent variable the perception level of students role of public libraries in getting information towards women empowerment (W) from 13 consequent variables

Variables	'r' Value
Effectiveness of Kanyashree one time grant (X_1)	-0.0712
Impact of women empowerment (X_{17})	0.0386
Public services will help the women empowerment (X_{19})	0.1076
Encourage about job related work (X_{20})	-0.1452
The perception level of students on women empowerment (X_{18})	0.0854
Availability of public library (X_{21})	0.8867**
Use of public library (X_{22})	0.8999**
Role of public libraries towards public services (X_{23})	0.6999**
Role of public libraries towards women empowerment (X_{24})	0.7586**
Role of public libraries towards job related training (X_{25})	0.9209**
Role of public libraries towards kind of information (X_{27})	0.6062**
Uses of School or College library (X_{28})	0.1174
Kind of books uses of School or College library (X_{29})	0.1027

Critical value (2-Tail, 0.05) = +or- 0.197   *Significant at 5% level
Critical value (2-Tail, 0.01) = +or- 0.256   ** Significant at 1% level

This is largely because of the government's Kanyashree Prakalpa−annual scholarships and one-time grant to encourage girl students of poor families to study". Within a year after the scheme was launched on 1

October, 2013, the Madrasah saw a surprising increase in the number of girls attending higher classes. Dropouts among girl students fell from 100 to 30 and the number

of child marriages went down from 30 a year to seven. Kanyashree, the West Bengal government's initiative to financially assist and help educate and empower women, has bagged the National e-governance Award, for outstanding performance in citizen-centric service and the Manthan Award in the Women and Empowerment category. Girls aged 13-18 are entitled to an annual scholarship of Rs. 500 and those older can get a one-time grant of Rs. 25,000 provided that she pursues higher studies, takes up vocational training or starts a small business for her livelihood instead of getting married. With over 2.4 million girls between 13 and 25 availing of the scholarship, the project is a model for the centre's Beti Bachao, Beti Padhao (Educate the girl child, save the girl child) initiative. The Kanyashree budget is Rs. 1,000 crore, as against Rs. 100 crore allotted for its federal counterpart.

Table 8: Multiple Regression Analysis

Variables	" " value	"t" value
Effectiveness of Kanyashree one time grant (X_1)	-0.012240	-0.274
Impact of women empowerment (X_{17})	-0.030610	-0.672
Public services will help the women empowerment (X_{19})	0.030156	0.339
Encourage about job related work (X_{20})	0.006301	0.083
The perception level of students on women empowerment (X_{18})	0.012597	0.214
Availability of public library (X_{21})	0.293462	3.500**
Use of public library (X_{22})	0.126503	1.273
Role of public libraries towards public services (X_{23})	0.045166	0.919
Role of public libraries towards women empowerment (X_{24})	0.093016	1.786
Role of public libraries towards job related training (X_{25})	0.407834	4.819**
Role of public libraries towards kind of information (X_{27})	0.091816	2.003*
Uses of School or College library (X_{28})	-0.065718	-1.820
Kind of books uses of School or College library (X_{29})	0.049455	1.405

Critical value (2-Tail, 0.05) = +or– 1.988   *Significant at 5% level
Critical value (2-Tail, 0.01) = +or– 2.634   ** Significant at 1% level

Multiple R   = 0.95285
R Square   = 0.90793
Adjusted R Square   = 0.89402
Standard Error   = 0.97224
Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	13	801.66797	61.66677
Residual	86	81.29203	0.94526

F =   65.23815   Signif F = .0000

It obtained students' awareness of women's empowerment from 23 consequent variables we found that occupation of parents (X4), monthly income of parents (X5), monthly income of family (X6), electricity at home (X9), availability of Aadhaar card (X10), the school's or college's distance from your home (X11), how you go to school or college (X12), accessibility of private tuition (X13), family consent for studying in school or college (X15), impact of women empowerment (X17) and public services will help the women empowerment (X19) had strong positive impact on the level of perception of students on women empowerment.

And the variables such as go to regular school or College (X7), availability of food during school /college hour (X8), effectiveness of Kanyashree grant for dropout girls (X14), role of Schools in getting Kanyashree grant (X16), effectiveness of Kanyashree one time grant (X1) and encourage about job related work (X20) had strong negative bearing on the level of perception of students on women empowerment. The English daily "The Economic Times" published a report on 15th October, 2018 where it has been shown 'Anandadhara' scheme has been launched successful by Mamata Banerjee, honourable Chief Minister in empowering rural women

in West Bengal. The state government also distributes animals for rearing among the rural women to ensure their economic prosperity, she stated. The 'Anandadhara' scheme, initiated in 2012, is an anti-poverty programme for the rural poor, implemented through the organising of women into self-help groups (SHG). The aim of the scheme is to mobilize the rural poor and vulnerable people into self-managed institutions and support them for livelihood collectives.

Table 9. Step-down Regression Model	
Step I: X_{25}	
Multiple R	= 0.92090
R Square	= 0.84806
Adjusted R Square	= 0.84651
Standard Error	= 1.17003
Step II: X_{21}	
Multiple R	= 0.93957
R Square	= 0.88279
Adjusted R Square	= 0.88038
Standard Error	= 1.03291
Step III: X_{27}	
Multiple R	0.94418
R Square	= 0.89147
Adjusted R Square	= 0.88808
Standard Error	= 0.99909
Step IV: X_{24}	
Multiple R	= 0.94792
R Square	= 0.89856
Adjusted R Square	= 0.89429
Standard Error	= 0.97099

On the other hand Public Libraries have an important responsibility in empowering women. It is introduced the level of perception of students on the role of public libraries in accessing information on women's empowerment from 13 independent variables. It was revealed that Availability of public library (X21), Use of public library (X22), Role of public libraries towards public services (X23), Role of public libraries towards women empowerment (X24), Role of public libraries towards job related training (X25) and Role of public libraries towards kind of information (X27) had strong positive impact on the perception level of student's role of public libraries in getting information towards women empowerment.

Recommendations
- The purpose of public libraries is to empower villagers by improving information literacy. Based on the results of a study on empowerment levels, the study showed that the entire villagers in Bhangar-I used the technology in their daily life to seek information to solve work, school or other related problems . Technology is closely related to social life and has now become an integral part of it. People

who belong only to the elderly group do not use technology, while people in other age groups are used to using technology.
- In order for people to change their minds about the use of ICT for collection development, librarians must be trained and retrained.
- Librarians and staff in public libraries should know how the community's information literacy affects user needs. When public libraries know this, libraries can improve the quality of their services to the community. That is, the library can be called a user-oriented library.
- In Bhangar- I block one Librarian of a Public Library takes charge two or three libraries: therefore library services are hampered due to lack of proper library staffs.
- Take initiatives to improve the collections of the Library.
- Different training programmes, seminars, workshops etc. should be regularly organized for the library staff by the Public library Management.

CONCLUSION

In West Bengal out of 9.13 crore population, there are 48.71 per cent female population compared to 51.28 per cent males. Women empowerment is still a significant concern in the present situation. Women are discriminated and marginalised at every level of the society whether it is social participation, political participation, economic participation, access to education and also reproductive healthcare. Women are found to be economically very poor all over India. A few women are engaged in services and other activities. So they need economic power to be at par with men.

Public library is one of the most important places from where knowledge and information are disseminated to the common people on the basis of equality of access for all, regardless of age, race, sex, religion, nationality, language or social status. The lack of public library systems and the availability of facilities in rural public libraries in West Bengal are quite poor. If the public libraries come to the common people with better services and activities then the common people especially women will be surely benefited through them.

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An Analytical Study of Microfinance Services: Origin, Services and Limitations

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ABSTRACT

Microfinance, over the years, has been a major source of discussion and discourse in the field of finance as well as development. However, for many people, the concept of the microfinance services is vague and it creates certain confusion. As a result, there is a lack of understanding which results in erroneous decisions while gauging the impact of these services in qualitative as well as quantitative terms. Through this paper, the authors have attempted to provide a clear and concise understanding of the origin, meaning, success factors, services and limitations of these services. These explanations may assist young researcher as well as academicians in developing a holistic understanding of microfinance services, specifically in the South Asian context, which may result in increased discourse and zealousness of research in the field.

KEY WORDS: MICROFINANCE, FINANCIAL INCLUSION, GRAMEEN MODEL, WOMEN EMPOWERMENT.

INTRODUCTION

Microfinance is seen to provide both financial and also non-financial services to the people who earn less but seek to start up new income-generating activities[1]. The idea of microfinance popped as poor and micro-entrepreneurs could be banked so that interest and the payable amount by repaid and the saving be done along with the provision of financial services so that their everyday needs are met. Being a discipline, the microfinance has generated few financial services that turn clients with low income as the intermediate bank customers[2]. To surpass similar issues in 1976, a Bangladesh professor and economist laid a model namely the Grameen Model. While he visited a poor village along with his students, he held a conversation with women that worked as a bamboo bench maker.

Owing to resource shortage, she was obligated to loan money from a local lender. She could borrow only the amount required to build one piece at one time. Microfinance survives lenders charge higher interest rates that are 10%. After the woman pays back both the principal amount along with the interest, she has very less amount to fulfil her basic needs. Hence, they own greater complimentary terms to the given loan amount. She alternatively would be safe from uncertainty and satisfy her basic needs. Dr Yunus saw this condition and decided to pay a small amount go few of 42 Weavers of a small basket. They were very happy to receive such money but regarded the same as loan and we're convinced to return the same. Dr Yunus realised that the small amount given to the poor not just help they meet their day to day needs but also force them to indulge in setting up something big. This continued for the next two years after which be a struct with an idea of setting up the Grameen Model.

Today, this model is by far the most successful in microfinance history3. The Grameen bank looks for the individuals that are poor but active. Also, the ones that are not part of financial services giver, these banks help the low class by giving them the desired services and lay focus on mobilized savings. Set up in Bangladesh, it aims at women empowerment by providing them with the required financial aid. An excellent tool and Institution in Bangladesh, the Grameen bank is successful in triggering the livelihood of people and therefore reduces the line of poverty. As stated in 1996, more than 1084 section of the bank has been set up in Bangladesh both at national and village level. Owing to such a huge success of the Dr Yunus model, similar initiatives have been set up in several underdeveloped and developing countries to reduce poverty. Around 7k microfinance institutions render services to 54million people across the globe. USD 18 million has been sanctioned as loan and USD 30 million saving accumulated4.

2.Benefits of Microfinance
The major benefits of microfinance services are as follows–: Reduction of vulnerability: A crucial advantage of the program of microfinance is the decline in vulnerability. Program of micro edit compels borrowers to insure each against the respective crises through the asset build-up. These can either be sold or kept as security or worthiness proof when they deal with lending agency and businessmen5.

Increased Consumption: Increment in the consumption of a household is a major advantage of microfinance. People who are on the verge of falling find the above two the major benefits. Additionally, minimal consumption increment and regular consumption improve the life quality and compel family plans to range longer6.

Reduced Income Poverty: Decline in income poverty is another micro edit benefit. This suggests that borrowers make more money than spent. As the poverty cycle stabilizes, borrowers seek money-making by this business and also pull them out of their poverty7.

Increased Employment Opportunities: Giving loans help the poor to pull themselves out of poverty and therefore enable them to increase the opportunity of employment amongst all8.

3.Key Success Factors of Microfinance
Adequate Provisioning: There rises the need to hold a 2% provision by the MIF so that the outstanding needs of the portfolio for the doubtful and bad contingency are met. The operations of lending must be transparent, timely and rely on the condition that the borrower is economically sound to repay the same.9

Capacity Building: There exists the need for the lender to provide support for the entire business owner that have skills and enable the lender to regain facility.10

Provision of Access to the Poor for Financial Services: Focus should be laid on the fact that poor does not require hand out but a hand that would support them to be self-capable and thrive with self-respect. Being dependent for a long time reduces the dignity of an individual11.

Appropriate Interest Regime: By setting the rate ceiling interest and giving the provision of loans as subsidized by both the agency as well as the government must not be seen appropriate for the success of the long term sustained practices of microfinance. The concerned financial services must be determined that would be provided by them and also price them significantly well12.

3.Limitations of Microfinance
Mission drift: Several critics have blamed the microfinance institutes about a significant mission drift, the microfinance industry, which was considered as one of the pioneers in society's battle against credit inequality and social injustice, has been blamed as behaving like rent-seekers and of preferring profit over social benefits. The recent crisis of Andhra Pradesh has only validated this point.13

Inability to reach the poorest of the poor: There is one more significant disadvantage for the microcredit programmes which is that they cannot get the hold to poor members of society. Assessing the Poverty and Vulnerability Impact of Micro-credit in Bangladesh has stated that there are restrictions on the poor members and it stops them to make loan investments in high-return activities.14

Microcredit dependency: Microcredit programmes have one more potential drawback which is involved with the nonthreatening statistics. A few investigators put forth the suggestion that high repayment rates, repetitive borrowing, and low drop-out rates show the reliance on microcredit programmes instead of appeal to proficient microcredit programmes on part of poor borrowers.15

Lack of regulations: Guidelines and parameters involved with setting up the microfinance services to poor are not controlled correctly. There is a high possibility of credit risk and default because of unregulated rules and regulations.16

The durability of poverty reduction: Durability of poverty reduction is also an issue associated with it. The mixture of cash in any amount will result in some sort of influence on poor borrowers.17

4.Financial Services Provided by Microfinance Institutions (MFIs):
MFIs offer a lot of facilities such as insurance, remittances, pension, and saving. Below are the explanations for the different facilities provided by MFIs.

Credit: Among all the facilities offered by MFIs, Credit is the most common financial service. MFIs usually provide loans for prolific purposes that mean the loan for investment in the income generation activities credit

might be availed by the clients for different intents like matching the working capital expenses, consumption intents, or agriculture. A simple assumption is made that the poor clients do not have proper awareness regarding the capability of business as they do not have enough capital for investments. The client might be lacking the financial abilities for expansion of the business which leads to the event where the client might not be able to make proper developments in their business or clients losing their business.

The people who have low income are in dire need of finance not only to generate income but for other intents as well, like medical expenses, social ceremonies, and education. Two methods can be seen here. There are a few MFIs, according to whom, the loan must be provided just for the productive purposes so the people with low income can pay off easily and there is no credit risk for MFIs. On the other hand, few MFIs stated that the consumption purposes like education, social ceremonies, or health hold the same amount of significance for clients and the clients should be necessarily borrowing for them from a certain source such as moneylenders, the ones charging the excessive interest rates from clients. According to these MFIs, clients would not get freedom from the controls of moneylenders when the consumption loans are not offered. MFIs have two contradictory beliefs and still, they should be following some fundamental principles when they are making credit expansion. Timelines of credit hold significance. When the credit is not provided to the client when it is needed, it leads to the loss of business prospect of the incapability to match an individual desire. Belated credit is not beneficial for the client and thus it can put pressure on the client.18.

Formal financial organizations might be unfitting for the microfinance and a significant reason for that might be the comparatively restricted outreach. Clients are not able to go to distant places to get a small loan as it would do nothing but increase the cost of the loan. The operating costs that are sustained to make loans available by client or institution which offer such services are basically in nature of translation cost. Small credit should be offered to decrease transaction cost and it should be quite close to the client. Credit should be provided at the doorways of clients so that the clients with low income can be appealed for small loans. Generally, the formal financial organizations tend not to offer loans if there is no collateral (something that a borrower deposits to secure a loan or credit). When a borrower makes a default, the lender can have the possession of collateral back. The borrowers who have low income are not able to provide any asset as collateral for a small loan and thus the MFIs offer loans with no collaterals at all.

When the MFIs ask for the collaterals, there would be restrictions imposed upon the access of microfinance to a considerable degree and the intent of microfinance will be a setback. Simple process and product is also a crucial factor of microfinance. Most of the microfinance clients have considerably low incomes and are uneducated, due

to which, loan products along with the process of loan availability and repaying should be very simple so those poor and uneducated people should not have to face a hard time understanding it. MFIs must completely rule out the complicated paperwork and documentation.19.

Savings: Savings are the deposit facilities through which one can save small amounts of money so they can use it in the coming future. When there is a very low balance requirement, the savings accounts are helpful for the people to save money so they can cope up with the unpredictable expenses and make planning for future investments. Saving is an essential financial service that is quite helpful for people in facilitating the cash flows and making use of money when it is needed instead of when it is earned. People with low incomes usually do not have much savings or have unstable savings with no access to banks. Because of the small amount of savings and unpredictability, they are not able to access banks. Savings hold the same amount of significance for the clients and MFIs and it can be considered as a reliable source of mandatory savings which can also be seen in SHG model where members must save for six months before making considerations for bank loans or MFI loans.

Six months of regular saving is listed to be a mandatory obligation in the case of SHG bank linkages. The client will not be able to pull out their savings from MFI till the time there is a loan outstanding and therefore the compulsory savings can be considered as a type of collateral. There are a lot of MFIs who have a policy of non-withdraw capability of savings till the time the client is a member of MFI. Once the client pulls out the compulsory savings, they are abandoned. It is also possible for MFIs to gather client savings as per the suitability of clients. In the case of MFI, the client can deposit any amount at any time, and it is known as voluntary savings.20.

It is possible to withdraw the voluntary savings but that does not indicate the end of the client relationship. There might be different reasons for voluntary savings and thus the MFIs present various saving products like recurring deposits, monthly income proposals, or fixed deposits, just like a bank. There are different characteristics which every product possesses and they are associated with an interest rate, withdraw ability, etc. Some MFIs might provide compulsory along with voluntary saving services to clients. Savings are very rarely an adequate funding source and it should be observed how the majority of the MFIs would have to borrow from commercial sources when they need a large programme and rapid expansions. Savings can be extra funding source in such conditions and they can't take place of borrowings entirely.21.

Insurance: In Insurance, people, businesses and other institutions make repayments so there can be equal risk sharing. Different doubts and indecisions are there which can impose a risk for people and they can be unexpected disease or death. Along with disease and death, there can also be risks such as crop failure or cattle in rural places

and it can devastate the sources of revenue of people. Insurance can prove to be of huge advantage to decrease the exposure with these risks. In the insurance scheme, a client must pay a fixed amount each year known as premium for having protection against risk. The insurance companies take care of those and make sure that premium is paid properly, as stipulated. Insurance which is offered to the people with less income is usually called micro-insurance. In India, the micro-insurance proposals first began by social organizations so the securities can be offered. With the developments in the MFIs of the nation, micro-insurance made developments too and it was assisted by the insurance regulatory and development authority (IRDA) which is the regulating body for insurance institutions in India. It is rendered compulsory for every insurance institution by IRDA to make expansion in the services to the rural and social areas in India. MFIs were observed to be the proper associates for this by the insurance institutions.

The insurance institutions and MFIs are constantly in the talks of offering the group or individual insurance plans for the people with low income. Reach of these plans has restrictions but the potential seems to be quite significant. Insurance institutions are pressured by the regulations to offer insurance in the rural and social sector and thus the proper outreach in the social and rural sector from proper partners for insurance institutions can prove to be efficient distribution channels.[22].

The insurance companies are therefore frequently working together with MFIs as MFIs can serve as the agent to insurance companies. Insurance companies can garner clients in huge number when associated with MFI and MFI can be provided with living as an insurance company will be paying commission to MFI for offering the linkage facilities. If there is some ill-fated event like the death of a client, then MFI gets the advantage as MFI might take care of the outstanding loan of the client with the help of coverage amount paid by the insurance company and rest of the amount is paid to the family member of client. There is the pressure of loan on the family if the client dies, and thus it can be neglected with insurance.

There are a few MFIs that offer insurance facilities by themselves instead of working together with external insurance institutions. MFIs are aware of the fundamental risk in offering such a service. Governing risk is also there because MFIs are not deemed fitting to do insurance as business and IRDA does not permit of them. It leads to a growth in the contingent liability of MFI which is also another risk. Contingent liability refers to a liability that arises on the occurrence of particular events. Natural disasters or epidemic of diseases or infection leading to the considerable damage of loss of life might make MFI legally responsible to pay a considerable amount of sum insured by a lot of clients.[23]

Remittance: In the Remittance, the funds or money are transferred from the people at one place to people at the other place, especially beyond the borders to family and friends. MFIs providing this financial facility are still at its initial stage and on the eventual rise but it has a lot of potential in the time ahead. India is a nation where a considerable amount of internal migration of different sort takes place likes rural-urban/rural-rural, indoors of district/interstate/state, seasonal/semi-permanent, individual/groups, self-driven/arranged with the help of agents, man/woman, manual/skilled/secretarial employees, with/without families. Their degree is most likely to increase with the rise in high development states and the places within. Majority of the migrants most probably need the transfer of funds facilities except the seasonal migrants or short-distance migrants. Migrants require handy, low-cost and secure ways for transferring their savings back to the families. Banks and post offices provide the formal money transfer facilities which are considered to be not sufficient and also and unsuitable for poor people. MFIs, in such circumstances, seem to be a proper option in offering transfer of funds facilities because of their outreach to distant places.24

CONCLUSION

In conclusion, we can state that the microfinance firms are contributing heavily to ensuring credit accessibility to the poor, by eliminating documentation barriers, ensuring group solidarity, minimizing and diversifying risk. The strategy of targeting females also ensures greater participation in decision making and assist in national and international objective of women empowerment.25 It is to be noticed here that apart from the traditional group lending practices, a number of microfinance institutes across several countries are also implementing the model of Individual lending.26 It will be of significance importance to understand the impact of individual lending on several development parameters such as Gender equality , women empowerment etc.

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A Positive Link of Organizational Justice with Organizational Citizenship Behavior

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ABSTRACT

The study aimed to determine employees' perception of the impact of organizational justice on and its association with organizational citizenship behavior. This is a conceptual paper that reviews the literature on organizational justice and organizational citizenship behavior. This study found that all elements of organizational justice (distributive justice, procedural justice and interactional justice) are equally important factors that affect organizational citizenship behavior.

KEY WORDS: ORGANIZATIONAL JUSTICE, DISTRIBUTIVE JUSTICE, PROCEDURAL JUSTICE, INTERACTIONAL JUSTICE, ORGANIZATIONAL CITIZENSHIP BEHAVIOUR.

INTRODUCTION

Organizational citizenship behavior (OCB) refers to the behavior of individuals that is very beneficial to the organization. or OCB can be defined as employees contributing to the organization much more than expected; The organization in turn offers fairness and justice at the workplace, so that every employee feels recognized valued and respected. Justice must be provided to individuals not simply for accurateness but because fairness is of key social importance and the feelings of fairness has essential value in the society and organization. OCB is a key factor to organizational performance. OCB is mainly characterized by individuals' voluntary performing additional roles that are above and beyond their work, thus benefiting the organization.

OCB has been well identified to play a pivotal role in employees' behavior in the organization. Organizational justice is important for the functioning of employees in the work environment, and it is closely related to OCB. Researchers have determined that organizational justice requires customary intense of relating and explaining how employee act in the workplace. Employees are less fretful if they perceive that the organization recognizes their value, is concerned about them and treats them fairly.

Research has described under this perception, employees may consider a workroom event to be either -'fair-' or -'biased'-. Currently employees prefer working in organizations providing impartial and just workplaces, where everybody feels recognized considered, and appreciated. Justice must be accepted not simply because accuracy is not practicable, but because fairness is of social significance and the spirit of impartiality is important at individual and group levels. Employees opine that justice in all human resources practices is important; therefore increasing research attention has been paid to justice in human resources practices. However, less research surveying this 'lenient' side of the organization has been conducted. The main aim of reviews of organizations and supervisors is to prove their trust-worthiness.

Adam's in his Equity Theory (1963) elucidated that once employee feels they are equally treated, they feel more motivated and this inspiration inclined to be altered into optimistic work and attitude. And if an employee feels he/she is treated unfairly he/she is more likely to be feel discouraged and inclined to display a negative work behaviour and attitude. Every employee need money to endure their quality of life if employee feels that they are unfairly compensated their retention rate will decline and they will search for other job opportunities. Personnel who devote their energy and time in the workplace expect impartial behavior from their leaders. This expectation indicates that leaders have an extended responsibility of justice, which is recognized by personnel. Employees must feel that they are t fairly treated by the organization and they need to feel that they are an element of the organization and will accordingly react.

Research gap: In most of the available literature problems are mainly restricted to the handful of attempts to investigate empirically organizational justice in organizational and individual success. The present study has been undertaken to fill the gap in the present literature relating to organizational justice and OCB. Though previous study suggests organizational justice is associated with OCB. Blakely et al., (2005) found that when employees have optimistic perception of their superior's fair behaviour, the prospect of OCB increases. Moorman (1991) suggested that research on organizational justice and OCB discloses a causal relationship between the two. Eric et al., (2008) mentioned that subordinates, who have a higher perception of organizational justice shows a greater propensity to involve and participate in OCB. This paper tries attempts to fill the gap by discussing a conceptual framework in order to understand the relationship between organizational justice and OCB. This conceptual framework is showing the all dimensions of organizational justice that linked to the OCB. Association of organizational justice with OCB thus need to be recognize as requiring intensive research.

Objectives: –
The main aim of this study was to identify the association of organizational justice with OCB. The secondary aims were as follows:

1. To determine the influence of distributive justice on OCB.
2. To determine the influence of procedural justice on OCB.
3. To determine the influence of interactional justice on OCB.

Literature review: Numerous studies have focused on the association of organizational justice with OCB. Such studies have recommended that employees must express their redundant behavior and that the organizations must conduct truthful and impartial practices and actions. In this study, we conducted literature review on OCB and organizational justice. On the basis of previous studies we identified an association of organizational justice with OCB.

Adams, (1963) and Moorman- (1991) have coined the terms -'justice'- and -'fairness-' which are commonly used in the literature. Wendell French (1964) proposed the term "-organizational justice-",which was defined by Greenberg (1990) and; Cropanzano (1993) the fair, principled, and just work environment provided by organizations to their workforces, as determined by an organizational psychologist.; Adams (1965) described that organizational justice is based on the perception of fairness. Bies and Tripp (1995) suggested that in an organizational system, fairness pertains to the instructions and social customs leading to how both negative and positive consequences (e.g., punishments and rewards) are to be distributed, what would be the measures for determining of decisions, and how individuals act interpersonally.

"Moorman (1991,_845) revealed that organizational justice is concerned with "the ways in which personnel defined, that is whether they had been treated justly in their employments, and the ways in which those determinations affected other work related variables". Coetzee (2005) stated that organizational justice affects the attitude and performance of personnel and subsequently, their enactment and organizational achievement. Fortlin and Fellen (2008) stated that although the effects and antecedents of perceived fair behavior exhibited by organizations have been the focus of extensive research, the positive concept of fairness or unfairness of organizations for personnel has received little research attention.

According to Konovsky (2000, 489), fairness or justice is essential for both superiors and employees because its presence can resolve contradictions and establish social structures. Colquitt et al., (2001) stated that several previous studies conducted over the last few years have - strengthened the vital role of fairness in the workplace on outcomes. Employees tend to increase absenteeism, turnover, stress, and retaliatory intentions when they feel that they are treated unfairly. Nowakawski and Conlon (2005) stated that when employees feel that they are treated justly, they exhibit an optimistic work approach and behaviors such as satisfaction, commitment, citizenship behaviors, and acceptance of organizational change. -Folger and Cropanzano, (1998, xii) described that "fairness keeps individuals organized whereas unfairness can pull them apart. Zoghbi-Manrique de- Lara (2010) provided a significant finding related to the effect of organizational justice: an employee's observations concerning the justice received from -organizations affect their perception of fair and morally interdict behaviors, including workplace deviation or greatly appraised behaviors, for example citizenship behaviors that -exceed moral expectations in depth.

According to Greenberg (1990), in the past three decades, organizational justice has become a relevant concern in vocational and organizational psychology. Organizational fairness is defined as a set of fair actions commonly conducted by the organization. Colquitt et al., (2001) indicated that organizational justice comprises three

dimensions: distributive, procedural, and interactional justice. McFarlin and Sweeney, (1992), Bhupatkar, (2003), and McCain et al. (2010) have suggested that the provision of fair behaviors to personnel may positively affect many factors of organization behavior, including job satisfaction. This result has also been found for organization commitment by Wang et al., (2010) as well as Suliman and Kathairi (2013); for organization trust by Mclean (2009); and for OCB by Moorman (1991). Wang et al., (2010) stated that employee performance affects customer satisfaction and reliability. Maleki and Taheri (2012) indicated that understanding how individuals make decisions about fairness, where they are employed and -how they perceive justice or in justice -are important, specifically to reinforce an understanding of organizational behavior.

According to Konovsky (2000), justice is of value in organizations; Coetzee (2005) stated that in the contexts of promotion judgment, the allocation of a task or reward or any type of social exchange, justice is important in any organization. According to Johnson (2007), it broadly studied in justice that it has been a subject regarding different extents and if the extents may be splendid from each other. The theory of OCB was originally developed by Bateman and Organ (1983); they attempted to associate job satisfaction with organizational functioning. Organ (1988) called OCB as -"good soldier syndrome"-. Behaviors linked with the syndrome are voluntary behaviors, regularity, helping others, volunteering, and innovating (Organ, 1990) as the need of unenviable actions, such as disagreeing, complaining, and finding mistakes with others. Organ (1988, 1997) stated that OCB for voluntary and discretionary behaviours of individuals, - improves overall organizational effectiveness. Examples of OCB protecting the organization when other employees criticize it and helping co-worker with their responsibilities.

According to Organ (1988), OCB basically refers to a task that is not obligatory and not acknowledged by any formal reward system, but such tasks have a supportive effect on the organization. Podsakoff et al. (2000), - formulated the primary idea that OCB must be occasionally formally acknowledged, and that it affects employee's job performance. Podsakoff et al. (1993) examined whether OCB is ultimately supportive to the organization. One possible way by which OCB can cause uncooperative end results organizationally is by declining personnel observations of organizational justice, - once particular elements of OCB have been recognized or requited by co-workers. OCB is defined as a set of flexible work actions that indicate the essentiality of necessities of a job. OCBs are frequently defined as behaviours that are beyond the tasks expected to be performed.

They are comparable to psychological contracts and play a vital role in refining the organization's general health and employees' satisfaction with the organization, and thereby, generating an impression on productivity and value of work teams and organizations. Organ

and Ryan (1995) defined OCB as individual assistances in the workplace that go beyond the role constrains and contractually rewarded job achievements. Nemeth and Staw (1989) demonstrated that OCB can improve organizational performances and confer a competitive advantage to organizations as it inspires personnel to perform roles beyond the formal job requirements. OCB support the organization to be more successful in the on-going environment and can enable innovation and creativity in organizations.

Conceptual framework
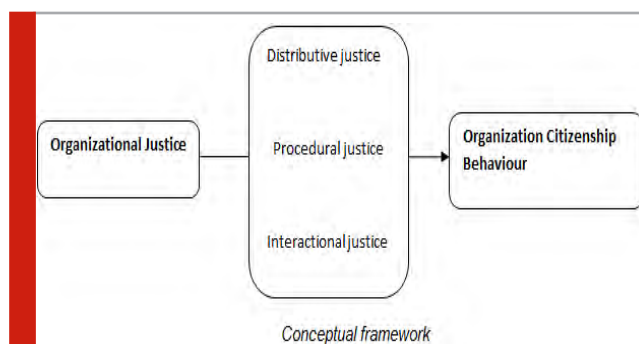
Dimensions of organizational justice:–

Reactions of employees can be organized into three items of fairness. Research on distributive justice was conducted from 1950' to 1970', focusing on the distribution of various means and measures. Adams (1965) stated that distributive justice determines the relevance of outcomes. -Distributive justice is related to distributions of rewards based on the intrinsic personalities of workers, where some receive them and some do not; workers visualize this as employers do not regard them uniformly. Benefits, pay or salary, job status, satisfying supervision, and a diversity of informal and formal rewards are pre-conditions that are associated with personal traits such as intelligence, education work, seniority, -skills, experience- , sex, age group, social status and traditional backgrounds.

According to Colquitt et al., (2001), research on distributive justice often starts with the analysis of OCB, which has been found to be a deficient prognosticator of the types of justice. Konovsky and Pugh,-(1994) revealed that in relation to the interactional and procedural justice-, distributive justice secures the economic status more firmly than the social exchange. Organ proposed that it is important to understand the method through which distributive justice influences OCB; in addition to social exchanges, certain personality traits promote economic exchanges with in the organization. However if personnel associated with their employers only for economic gains, distributive justice exerts a lesser, if any, OCB effect. The theory of procedural justice was first presented by Thibaut and Walker (1975); it's; primarily converges on the authorized process. Colquitt et al., (2001) investigated procedural justice in other settings, such as organizational settings. Cohen-Charash and Spector (2001, 280) described procedural justice as "the perceived justice of the process by which results were achieved".

Kim and Mauborgne (1998) stated that procedural justice completely influences the behavior or attitudes of an individual in the organization. Lind and Tyler (1988) stated that when individuals perceive their organization to be fair, they are ready to proceed in an intended and collective approach for their organizations. Thus, procedural justice plays the main role in determining of organizational behaviours and attitudes. Moorman (1991) indicated that many pragmatic studies have aimed to determine the association between procedural justice and OCB. Moorman (1991) evaluated the association of procedural justice with the five elements of OCB (i.e., altruism, courtesy, sportsmanship, conscientiousness, and civic virtue) in the United States.

In 1986 Bies and Moag first introduced interactional justice and suggested the following four criteria: justification (i.e., employers should provide the required explanations for the decision- making approach), respectability (i.e., leaders should refrain from improper or prejudicial statements), honesty (i.e., explanation should be open, candid, and honest), and honour (i.e., it is expected from the organization that subordinates are treated with dignity and sincerity). Niehoff and Moorman (1993) defined interactional justice as the perceived justice of relational behaviour of superiors and administrative staff .Bies and Moag (1986) stated that interactional justice is associated with the perceptions of being fairly treated with propriety, honesty, and respect in the workplace.

Interactional justice is related to the excellence of relational system and action of employees (e.g., superiors must speaks with sensitivity and sincerity) as well as - the level by whatever reason that supports the results are being related. Tyler and Bies,-(1990) indicated that this area of fairness is managed by the human side of organizational traditions and, is associated with conveying traits (e.g., faithfulness, respect, and politeness) among all the sources and recipients of the justice. Interactional justice determines the value of relational treatment expected from employees, whereas organizational justice is essential for the organization because more enhanced perceptions of organizational justice may generate- better OCB.

Association between organizational justice and OCB: The association between organizational justice and OCB was described from the perspectives of social exchange theory by Blau (1964) and equity theory by Adams (1965). When personnel feel that they have been treated impartially, they perform additional roles in response. Recurrently, when personnel identify divergence among the process and results in the affiliation on the referent and they can change their OCB in system to moderate their disagreement. Theoretically, justification provides practical encouragement to employees, explaining the positive relationship between organizational justice and OCB. -Organ (1988) determined that organizational justice is an effective predictor of OCB. IIies et al., (2007) conducted a meta- analysis of the situational

and attitudinal elements of OCB and discovered that organizational justice is a stronger mediator of OCB among several relevant variables.

In a study of 270 workers of two medium-scale organizations, Moorman (1991) reported that fairness is important for the promotion of citizenship behavior. Arslan and Pekdmir (2011) conducted research on 233 blue-collar employees working in various sections of a production company and found an important association between the organizational justice of employees and OCB; they also found that distributive and interactional justice are very effective in this relationship. Organ (1990) stated that impartiality perception plays key roles in developing OCB. Distributive justice and procedural justice play important roles in developing OCB in personnel who feel that the organization is more cooperative. The primarily highlighted emotional factor that inspires the OCB is the viewpoint of employees for justice.

Findings: Considering the conceptual framework and going through the literature review it shows that there is a significant relationship between organizational justice and organizational citizenship behaviour. It is important and needed to create a positive environment by the managers which can foster the OCB. These findings can also help the organization to understand how the fairness could contribute towards the effective management of employees through the implementation of fair organizational policies such as monetary and non-monetary rewards and performance assessment policies. It is needed to distribute and allocate resources and rewards fairly in direction to establish an OCB in a way that employees can trust in justice observation.

Managerial Implications:

The study revealed that all the dimensions of organizational justice (distributive justice, procedural justice and interactional justice) are positively associated with OCB. Therefore, the organization must take notice of all employee's perception of fairness within the organization. The organization need to train the enhancement of employee's perception of fairness through the planned policies initiatives that recognize the value of employees and treat them with dignity and respect. So that the employees also try to lead towards the OCB. This study is expected to contribute in the field of human resource management in suggesting suitable strategies for better implementations of designed strategies and management practices in various organizations for betterment of employees as well as for the organization. Organization need to ensure the practice of organizational justice so that it can create assurance and faithfulness among the workforces. This will then influence employees OCB. It is found the organizational justice have positive impact on OCB that means if personnel find their organization unbiased & just in procedural, distribution process and interactional system, they are more inclined to show OCB. Under a high level of organizational justice, employees tend to feel more secured and be engaged deeper in OCB's.

CONCLUSION

The current literature on organizational justice and OCB suggests the presence of a relationship between organizational justice and OCB elements. This study reviewed organizational justice and OCB from the perspectives of social exchange theory by Blau (1964) and equity theory by Adams (1965). These theories suggest that when - employees perceives that the organization fairly treats them, employees then perceive equal and fair treatment; in response, they exhibit behavior that facilitates the progress and prosperity of organizations. That behavior may encompass the distribution of information to their colleagues, disseminating a good and supportive image of the organization. Organizational justice was evaluated based on its three dimensions: distributive, procedural, and interactional justice.

These three dimensions of organizational justice perception influence on OCB. -Trevino and Weaver (2001) revealed that when employees perceived unfair treatment from the organization, this led to turndown in their OCB contribution. This turndown in OCB can exert negative effects on the organization, such as withdrawal behaviour or counterproductive behaviours. Additionally if employees feel that the organization is treating them fairly, then they contributed to the organizational growth by exhibiting OCB. Thus justice provides a primary contribution to citizenship behavior within an organization.

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The Brighter Side of Corona Pandemic and Emerging Opportunities

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ABSTRACT

History is evident that Corona like pandemics always gives lot of challenges, but it is also a fact that behind these challenges there exist a hidden opportunities and the brighter side. At present Corona pandemic is the world's biggest problem which has force all of us remain inside our home. We are not allowed to do our routine work by the Government as it is the need of an hour if we want to be safe and healthy. Along with this the ugliest and the darkest side of Covid 19 attack includes many of people have already died and still many are suffering with this deadly viral disease. Due to this schools and colleges are closed, employees are losing their jobs, health care system is overloaded, many companies are facing or are at the verge of bankruptcy, stock markets are collapsing and almost all the countries are bound to spend billions of money on medical equipments, testing kits and medicines etc. people who are depend upon daily wages are even facing the problem of getting daily meals for their families. Although Governments, NGO's and some social worker groups are trying their best to help the under privileged people, but it is not sufficient. As this is a pandemic this can only be done, and in fact people support cannot be neglected of overlooked.

This paper is based on the secondary data. With the help of this paper author wants to show the brighter side of this pandemic. At this time, people have come closer not only with their family members but also a feeling of national integration is also emerged in them. People have forgotten negativities, we have observed a tremendous decrease in crime rates, accidents etc. Apart from this, here in this paper author has taken an opportunity to share areas of opportunities for an individual or a corporate house how can they improve themselves or can develop new dimensions for themselves and can make their life different and unique. Here we have seen the positive outcomes of covid-19 in three main areas that is personal, professional and environment front.

KEY WORDS: CORONA, COVID -19, BUSINESS, JOB, ENVIRONMENT, HIDDEN OPPORTUNITIES.

INTRODUCTION

In this paper author review the positive or the brighter side of this pandemic. After that he has taken some data from the history of other pandemics which occurred in the past and the kind of benefits was drawn at that time. In this study he figures out the opportunities of covid-19 breakout. The literature also covers that before this pandemic we were exploiting the resources like anything or rather we can say that we became blind in the race of industrialization, but this pandemic has stopped everything and has brought the human civilization at the reset position. This problem of corona is a multi-disciplinary problem solving challenge and a health problem of global concern which need a comprehensive and holistic thinking approach or resolution where we can see that it will raise human intelligence over the Artificial intelligence, Yudkowsky (2008). This paper

tries to appreciate the capacities of various communities in building their immunities. Here, immunity means immunity from the media and its role at the time of this serious global problem.

When world Health organization (WHO) released a report in January 2020 to declare the outbreak of new corona virus disease Covid-19 entire world came into the threat and along with this WHO also shared in the report that it is that much serious that it comes under the category of Health emergency of International concern. Very soon we have experienced that this disease has spread throughout the world in the very fast pace. In March 2020 WHO declared this viral disease as a pandemic. It is observed that Indian Government has taken proactive measures in terms of lockdown by means of which they have sat an example worldwide in a fight against this pandemic. It is evident that this disease has bought lot many outcomes in the darker side in the form of millions of deaths across the world.

The Covid-19 has a lot of off-putting and darker sides. Throughout the globe in different nations, public are getting ill and dying, college, school, and Universities are closed, the healthcare and medical system is over burdened, people are losing their jobs and employment, companies and corporate houses are facing or are at the verge of bankruptcy, stock markets are collapsing and as a reason of which countries have to spend billions and billions of money on medical aid and bailouts. And for each and every individual, whether they are directly or indirectly suffering, Covid-19 is a massive stressor trembling up our mind and body along with triggering out fears and uncertainties. It is not a matter how much it is sad about this, there is other side of this as well. In fact the song of Monty Python is quite suits to this situation "Always look on the bright side of life". So let us not over think about the negative side, and forget about this pandemic and utilize time to its best in this crisis situation.

As we know in a SWOT analysis, there are four quadrants that is if there is strengths at one side than against it weaknesses are present similarly against threats there exists the opportunities. In the current scenario, lot of opportunities of corona or covid-19 have emerged which could be seen as its brighter side. Here this explains about those prospects and opportunities which are available for people who are affected and even for those who are facing lockdown by the crisis. Here we have explained the positive outcomes of covid-19 in three main areas that is personal, professional and environment front.

Literature Review: Any unseen situation like natural calamity or pandemic like covid 19 bring pessimistic thoughts in the mind. However as a positive person we should not ignore the hidden benefits and opportunities with the momentum and pace of the crisis situation Buheji (2016). After passing the one century of the deadliest epidemic in the history- in 1918 the Spanish influenza outbreak in which more than 50 Million people died, the frequency of these types of epidemics and pandemics are increasing as per mentioned by The World Economic Forum Candeias and Morhard (2018). Apart from Corona virus, there are many other epidemics outbreaks have happened in the recent past like SARS, swine flu, MERS, Ebola, Zika and yellow fever etc. These all the crises and problems have been keeping the entire globe in the position of defence in just the last few years, Gates (2015).

The World Health Organization (WHO) validated in receiving quite 5,000 early-warning disease signals per month, from across the world in these previous couple of years. Around 300 of those warnings are usually investigated in-depth with effect from (2018). The number and therefore the quite communicable disease outbreaks have increased significantly over the past 30 years and are expected to extend more sharply within the next 30 years, The National Academies of Sciences Engineering Medicine (2016a). The economic impact of every major outbreak as per the planet bank estimated to cost quite $500 billion, or 1% of the worldwide income. Gates (2015), Candeias and Morhard (2018). Kim and Liu (2012) mentioned how the company and government organizations answer the 2009 flu pandemic opened many opportunities to the community. One could see this from the historical sequences over the last thousand years where most of the discoveries and inventions came in periods of crises and diseases, Caselli (2006). During such crises, societal cohesion appears, and less differentiation between race and religion occurs, Green (2011).

This condition force humans to start seeing, how the epidemic making them equal without gaps in income, gender, etc. Andy Grove, the previous Intel CEO, said one "Bad companies are destroyed by crisis. Good companies survive them; great companies are improved by them.", Grove (1996). Same applies to communities. Hence, we will experience and believe that epidemics bring us benefits once we prefer to reject our current assumptions that cause us specific judgments. In this point we might see epidemics not as obstacles but as flexible borders.

2.1.3. Crisis that Come thanks to Extreme Capitalism Society Studies show that capitalism society would be destroyed by its own success, thanks to the growing hostility of the institutions of a free society and therefore the chaos of the entrepreneurial free enterprise that's with in the other hand is losing the sources of its intrinsic wealth. This is often causing the present capitalism crisis to be more hostile whenever it comes thanks to the extent of how the planet communities frequently forget how fragile the free enterprise is. The threat from capitalism practices is more realized today with the speed of the transformation of the Chinese and other similar highly populated emerging economies towards capitalism lifestyle and mindsets.

The surge of travelling between countries besides the speed of life in such highly populated countries are what predicts scientists, because the Hong Kong epidemiologist Professor Gabriel Leung, have a high probability of being accurate about his estimates that 65% of the planet

population would be infected with the corona virus. Caselli (2006). Ibn-Khaldun, confirms that none of the economies has continued, all of them went into death. The famous cycle of Ibn-Khaldun discusses how different economies would emerge then destroyed, although some stay for extended. (Talbi, 1981). Capitalism requires justice to survive; this "justice" is represented today by unearned wealth. so as to prevent the destruction, capitalism must specialize in realized productivity instead of that specialize in concentrating wealth with the few. Unless this move happens, we'll still experience stories about the disasters that happen after the worldwide risks outbreaks or disasters occurs, Gates (2015).

Visible opportunities and Brighter side of Covid-19 out break: It is up to us how we look and perceive about various situations in life. Today we are going through one of the biggest pandemic of the century which Corona pandemic. In this, we have seen that there is a darker side of covid-19 which has affected millions of people worldwide. Due to this many millions of people have died. There is another angle to look at it. Now in this section of the paper we will see the brighter end and impact of covid-19 on the life of general public and masses. These papers also figure out various opportunities which are immerged due to this pandemic.

1. More and leisure time: In today's fast pace economies time is money. It is the most valuable asset. But Covid-19 has left us with lot of spare time which we can utilize for many constructive purposes, before pandemic about which thought off but could not do because of lack of time. It does not mean that we were not getting spare time out of our busy professional commitments, but before covid-19 we used to spend that time in social get-togethers & events of entertainment like celebrating Birthdays, going complexes for watching movies, going out in restaurant, pubs, bars, gym, sport club, etc. All of a sudden, due to covid-19 these al the activities were stopped to leave us significant amount of extra spare time. And still, we are continued to live. This proves that we can live without these things and can utilize this time in some other significant activities.

But again one point to mention that it is not applicable to some areas like Health care, banks, administration and some other essential services. These people are real worriers who are keeping their life at stake for the wellbeing of general public. Here, when we have very much spare time we can utilize it on doing other things which we thought of before the pandemic. To seize this spare time we can just rearrange our schedule and time table. Now the question arises how it can be done? It can be done by-

- **Habit to start taking and developing responsibility:** It is not sufficient to have a let go attitude and being calm, the next step is to take the responsibility for your work and efforts which you can do. The very much responsibilities in this condition of pandemic is to take the necessary precautions like not to become the medium of spread of the virus, proper washing of hands, keeping social distancing, to stop unnecessary movement out of the house, adhere the rule and regulations set by the government and local administrative authorities etc.

- **Build character–** The reason why people get panic at the time of covid-19 is that it actually disturbs their fine crafted image that they can control everything and things are comfortable in every situation. But their myths get diluted here, and they come to know that everything is not controllable as it seems to be. So need of the hour is to build a character and one has to come out of their zone of comfort and to involve in those activities which we don't do and we expect from others to do. It having the guts and courage to stay calm at the face of Covid-19.

- **Self organize:** It is very important to keep calm and cool face at the time of crisis is very important which is possible and easy when your environment and is organized and well maintained. Corona kind of pandemics can disturb the mind or rather we can say it is actually disturbing. The current scenario is giving us an opportunity to rethink and reorganize the working style and way of living the life. Some of the things which we are bound to do or we are doing are , we are keeping ourselves locked in the home or getting self quarantine, many people have started working from their home, students are studying at home through live classes taken by their professors and teachers. We have stopped commuting. So these are the things which are giving us an opportunity to change, improve the way of working and life style even after we recover from this disease for future time to come.

- **Can Detox yourself:** It means it is a time when you can reshape yourself. Take this opportunity to rethink and self analyze about you. Change others thinking about you, even take out your changed and real self. The special benefit anybody can achieve with this is that, it helps to come out of your regular and monotonous routines. Accept this period as a gift to reinvent the new persona and personality. Just give challenge to your current belief system and take a strong step to achieve your better self, a better position and situation for other for whom you are responsible and accountable for.

- **By keeping our Calm:** In this panic situation of Covid-19 is very much important to keep calm and try to develop peace of mind. It can be done by practicing Yoga and meditation. If we maintain keep and calm attitude, than we will become rational in decision making. It is very important in the current condition, otherwise we will lose the ability to be rational in decision making. Apart from yoga and meditation we can shut down the noise of media and over notifications which can drastically reduce over information of this pandemic which creates and increase panic about covid-19. To know about Covid-19 and control measures is important but not more than twice in a day.

- **Develop let go attitude**: We know that if such pandemic happens, they are not in the control of any individual. So in this condition we are supposed to develop the let go attitude and try to unnecessary

worry about it. Of course it is not that easy as it is said. But it actually help to realize that the thing which can keep you busy is only your thoughts about anything, it could be your hobby, spending time with family, cooking, gardening etc. So don't over think about things which are beyond your control.

- **Start thinking sensibly**: Sometimes lot of panic nd disturbance occurs because of lot of fake news and false information. In this era of information technology, digital world and social media lot of fake news and rumors spread in a very fast pace, so here, we need to think wisely and sensibly. Some of the fake information regarding Corona virus like keep camphor and cloves near the body, drink alcohol, eat garlic etc. than this virus cannot affect you spread on social media sites and handles. So here we need to think wisely about such silly things. Some good companies like Facebook and Google have tried aggressively to filter such information but certain things we have to think wisely and rationally.
- **Pay attention:** These steps are the mantras to relieve your mind and brain from the disturbances and panics of covid-19. What actually you need is to pay attention on not only these but also on others, on the surroundings, to the things matter to you most, while using wisely all of your senses. This actually enables you to be focused on those things which help you to fight against this corona crisis and other things as well which troubles you.

As soon as you apply these mantras in the time of pandemic of covid -19, than you are half way done to fight against this disease. It will actually transform you as a leader to make you lead against this pandemic.

2. Opportunity to reconsider and reflect on your activities: It is a fact that this disease has adversely disturbed the life of people like anything, but it has provided us an opportunity to reconsider our activities, that is what to do, how to do and when to do in this tough times. Certain things which we used to taken for granted before this pandemic like going to health club or gym have suddenly is not possible at least for sometime or near future. Most of the working professionals have to change the style of working; they are now working from home in place of going to office, making all the meetings online through video conferencing etc. It shows that lot many routine activities are affected. So this gives a big opportunity to reorganize about our routine and habits. There are some more things which are also not possible like going for hang out with friends, commute 2 hrs daily for office or other purposes, going for parties, going to restaurants at least twice a week, going for movies etc. And it is not possible in coming near future.

Covid-19 has forced all of us to change our daily routine and life and in fact you have to continue even after this pandemic gets over for some future time to come. All of a sudden due to covid-19 we have experienced that employees have started working from their home without the direct supervision of their bosses. Due to this pandemic of Covid-19 we have observed a remarkable change in the innovation patterns. Some of the innovative initiatives what are been observed are- schools, colleges and universities have adopted the online mode of teaching that is live classes, restaurants are shifting their working mode of home deliveries. This all brought an opportunity to create new innovative practices which may even be continued even after the pandemic gets over.

3. Better meetings: Research says that people spend more than 23 hours in conducting and attending meetings out of which half time is just a waste of time. The current crisis has shown lot of opportunities to rethink how to deal with these meetings in a more innovative way. Now meetings are taking place mostly virtual and shorter. So automatically covid-19 has given a big and great opportunity to this area which is the most hated of corporate culture. The technology for this exists and matures for last many years, but due to covid-19 an unexpected get arise. The real chance here is to use this opportunity of organizing meetings with the help of new technology so that these meetings will be more useful and efficient, even also after the crisis.

4. Help and Reconnect: Crisis like this always bring the opportunities for all of to be closer and have a social bonding. It brings the feeling and thought among us to help others who actually need it. Although we actually all of sudden loosed the privilege to meet our friend, to visit their place etc. which actually created a kind of void and isolation resulting into the feeling of loneliness among some of us. But the feeling of "we are together and united against it" has also triggered interesting ways of connecting. Some of these activities have become viral like- Indians ringing bells and clapping for corona worriers, lighting a lamp, Italians singing together from their windows and balconies—but there are many small, local initiatives too to connect and help people who need it. These small initiatives could be to distribute food packets, fruits and groceries among people who need it. In today's modern era, many of us live in individualized societies, where we hardly talk with each other, but this crisis has given us an opportunity to reconnect with each other with the more intense emotional and social cohesiveness. This we are supposed to maintain even after this pandemic gets over. This opportunity has bought people close and together to protect themselves and their families.

5. Cleaner environment: Due to this pandemic, all most throughout the Globe there is lock down imposed by the respective Governments, as a result of which all the industrial operations are in a shut down position that is they are not operation. As industries and offices are closed people are not commuting on the road. Even people are also not allowed to move from one place to the by any of the means. Only essential services are operational and very few people are allowed to move from place to another. These people are doctors and nurses, administration like police and defense personal, supporting staff related to supply chain to move essential food items and dairy product. As a reason of which

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there is a drastically and significant decrease in the road traffic.

These all the reasons have significantly impacted the environment positively, and it is really a matter of good news for the world to we can say for the planet Earth. This pandemic has significantly reduced the level of green house gases like carbon di oxide (CO2), Carbon mono oxide (CO), sulphur di oxide (SO2) etc. and along with that the quality in rivers and lakes have improved like never before even after spending billions of money in cleaning them. Along with that the aquatic life has attained and achieved the old beauty as some dolphins have returned in Venice in just 2 or 3 weeks of control after the pandemic, at Jim Corbett national part some elephants have come out in the city. There are numerous examples from all across the globe.

These examples are ok, but the author can say that this lock down has provided us an opportunity to maintain and control such things even after the pandemic get over. This pandemic has also given an opportunity to think that how we have disturbed the ecology and environment for our selfish purposes in the race of industrialization and modernization. In addition to this, the covid-19 crisis has provided us an opportunity to re-evaluate & re-think about our lives and rearrange it in a way that it does not harm the ecology, environment and the planet earth more.

6. Opportunity to know each other (in the family): This is the first time ever in the history when people are getting the maximum opportunity to live closely together inside the houses. They actually know as a surprise, that they can or they actually are expert and talented in certain areas which any other family member does not know. People specially male members are trying their hands in cooking and coming up with different types of dishes and surprising and making others happy, specially their wife and children. In a busy schedule when people don't get time for others, this pandemic has generated opportunities when we are able to give time to our elders and family.

7. Modesty and acceptance: Last but not the least the final opportunity we get from this pandemic of covid-19 is getting an opportunity to understand that always things don't go as we think or want it happen. This pandemic of covid-19 is already declared global crisis and it is dangerous among all other pandemics like SARS which occurred in the recent past which were having less impact in comparison to this. And we had the 1973 oil crisis, but that was a man-made crisis. The corona virus is not man-made and it has disrupted the lives of millions of people across the globe.

The impact of Covid-19 has shown us that, no matter how well-planned and organized we are, one simple virus has disrupted and impacted life of millions and millions of people across the globe. As a result of which a great opportunity immerged in almost every aspect of life which we want to be in control. Either it is airline safety, health, or our calendars, we always lived in the false impression that full control is possible. The virus has given us a clear picture and made us awarded. It has provided us an opportunity to take more self-effacing role and accept that many things are simply not in our control they are beyond our control.Again, we can say that Covid-19 crisis has a large dark side, but these above opportunities showed and proved that, it has positive and brighter sides as well.

METHODOLOGY

In this paper the deep review of literature was done to develop and establish the hidden and visible opportunities possible due to corona outbreak. On the basis of this literature review future prediction is possible about the socio economic scenario after the covid pandemic This synthesis is focused on the effect and impact which are expected post pandemic. The synthesis focused on the impact expected on the worldwide cities and therefore the way the post-corona virus would support the transformation for socio-economic that's supported self-sufficiency and the intrinsic power. Also, an alert about the beginning of latest trends in fashion, electronics manufacturing and services industry is proposed. Finally, the synthesis from literature led to foresight the longer term role and therefore the rise of epidemiology, followed by the sort of viruses that are expected to return beyond the (COVID-19) crisis. This synthesis led to the event of a framework that would help the planet to develop a sustained preparedness for the mitigation of risks and therefore the optimization of opportunities that corona virus, or the other future threat that require to be faced by our species.

RESULT AND FINDINGS

In this time of crisis, world needs to be more lively and yet positive and optimistic about the means and ways of handling this potentially hazardous contagious pandemics. While this research paper has been written within three months, since the start of this deadly and very serious pandemic (covid-19) in the history of last 100 years. In the parts of the globe, where the epidemic is not yet weaken, the researchers believe that we can take full advantage of to make our life better and diverted from this pandemic. In this present time of crisis due to covid-19, we must create a global health risk framework capable, which can help and protect the human life all across the globe. This paper has opened lots of paths and discussed many opportunities on which future research can be done; here there is a huge research gap in the literature about certain areas such as how to deal with crisis situations similar to this type of pandemic after 2020.

Through this paper we have figure out that this is the right time when we can change our thinking pattern, like we can find out creative ideas to conduct our business in different way as after the pandemic the entire scenario will be different, So many businesses will face the very bad and critical time. So this is the time when we can

think in that direction. This research also delivered the outcome that after this covid-19 we will observe the different mindset among the people. Entire dimension and way of working will change. People may prefer working from home, we may observe or experience less traffic on roads as a result of which there will be decrease in road accidents. As road accidents will decrease the death rate of accidental death will also go down. The environmental pollution level will also go down as a result of fewer vehicles on the road. Along with findings there are some limitations of the research that is; this research is still to be tested by the practitioners and researchers to give the generalized outcomes. There is a reason that researchers look for other possible solutions of the new areas and possibilities related to this pandemic, or even more complex and life-threaten risks.

DISCUSSION AND CONCLUSION

The world must be more agile and yet optimistic about the meaning and means of handling the doubtless coming contagious pandemics. While this research paper has been written after but two months since the beginning of the (COVID-19), where the epidemic isn't yet diminished, the researchers believe that the chance to prop up our defenses should be used. We must create a worldwide health risk framework capable of protecting human lives and livelihoods worldwide from the threat of such communicable disease. The National Academies of Sciences Engineering Medicine (2016b) World Health Organization (WHO) got to change many of its methods to affect epidemics and the way it investigates a crisis. The repeated slow reaction and capacity of the WHO allows it to vary to a different level that ought to are reached now with the trends and therefore the speed of the humans' way of life. This paper and its framework open many paths for future research that are needed to fill the large gap within the literature about complex problem-solving in handling crises of comparable nature and complexity because the (COVID-19) and during a complication era beyond 2020.

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The Hues of Branding from the Political Perspective: The Indian Outlook

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ABSTRACT

Modern political scenario is such that it has been influenced by many phenomena. Political branding is one of them. Relatively new in the Indian perspective, the concept has made deep inroads in the advanced democracies like USA, UK, Japan, ANZ, Germany and the likes. The proliferation of technology has paved the way for political branding to make a mark in the domain of national and regional politics in India. Even the naysayers have taken notice to it thus acknowledging its impact in influencing the psychology and tendency of the present and potential voters. The present work highlights the theoretical framework which characterizes political branding. Through it, the author intends to bring to the fore how in the past few years and during the course of the last two general elections in 2014 and 2019, Indian politics has witness the amalgamation of branding in politics and how it's prudent usage has bore fruits for the parties and leaders.

KEY WORDS: BRANDING, POLITICAL BRANDING, POLITICS, INDIA, ELECTION.

INTRODUCTION

Authors like Danesi (2006) proclaim that brands have been a part of our lives since the 'dawn of history'. To prove his point, he cites the examples of trademarks, symbols and slogans which have very much been the identity of the goods traded since ancient times. Persian dates, Indian spices, Afghan dry fruits, are some examples of branding applied on goods since ages thereby giving them an identity of their own. As per him, branding and trading have existed side-by-side. Further, he says that the modern brands have resulted from the various trademarks and business terms which have come to be associated with the conduct of business. American Management Association- AMA (1960) defines a brand as - 'A name, term, sign, symbol, or design, or combination of them which is intended to identify the goods or services of one seller or a group of sellers and to differentiate them from those of competitors'. The comprehensive characteristic of the present definition goes a long with regard to making it amply clear that the horizon of a brand is quite broad. Even after more than a half-a-century, the definition holds ground, in fact, more so.

The periphery of the term brand has come to be synonymous with a host of things. At a point of time, politics and branding were not mentioned in the same sentence because it was perceived that they are as different as chalk and cheese. With time, things have changed and they reflect the realms of modern world. Branding itself has seen a sea change in terms of its applicability and significance. There is hardly a facet of contemporary living which is untouched by the phenomenon of branding. Politics, as a domain, has been marked by the presence of charisma and legacy, specifically in the Indian context. The Grand Old Party (GOP) of India, namely, Indian National Congress was

established in 1885, almost 135 years ago thus giving an indication of the significance which the party has had in the political framework of the nation.

The word brand is no more alien to the territory of politics though political puritans still are not much fascinated with the thought of a material-driven concept as branding having to do anything with an ideology-driven political set-up. The critics of the term still shrug off such concepts as political marketplace, in line with consumer marketplace meant for goods and services, proclaiming that it is not rational to compare the two. They object the commodification of the entire political exercise as they believe that it relegates leaders to the level of a product like detergent cake. On the other hand, the proponents of political branding opine similarities between the two domains outweigh the differences and the astuteness with which political parties and leaders apply the concept in their own scheme of things could very well determine their success in such events like an election. The political scientists tend to use the term branding as a stand-in for the various politics-related terms such as personalities, campaign packaging, party identity and the likes. These associations don't fit-in with the conventional definitions related to politics but then modern-era politics needs to mirror the changes which are happening in the contemporary society and the present way of living is such that brands have become an integral part of our lives.

In the traditional realms of politics, leaders used to be image-conscious (they still are). However, with time, they have come to realize the might of branding and the fact that branding is a better way of projecting one's candidature than being image-driven. This is because as compared to image, brand is a better perceived notion. When one talks about the image of an entity, it deals with the impressions formed in the mind based on how well one recalls all the communication related to it. The present study highlights that the pull of a strong political brand results in the reinvigorated interest of the old-timers and newfound interest of the new voters in such political exercises like election (which was evident with the highest-ever turnout of voters, both percentage-wise and number-wise during the 2014 and then again in 2019 general elections).

Rationale for the Usage of Branding in Politics: As per an article published in Washington Post by Hoyo and Chandler (2017), the recent presidential election in France saw voter abstention rising. This could be attributed to such factors as low economic growth, discontent among the masses over various issues, candidates being accused of promoting favoritism, nepotism; engaging in vitriolic speeches. The malicious campaigns being run and the abuses being hurled at the other contesting parties do no good for evoking the interest of the voters as all these alienate the voters. Further, Budge et al. (2001) and Whitely et al. (2005) opine that voters are increasingly becoming alienated to the whole exercise of voting due to their inability to differentiate among the various political parties on the basis of their manifesto and poll promises. As per them, all the parties seem the same. Needham (2006), Hay (1999) and Norris (1997) are of similar views in this regard as they point out that the distinctions between political parties and leaders, even if they exist, become 'blurred' in the eyes of the voters as they perceive them to be similar to each other or the differences among them are subtle which the common man finds difficult to decipher.

There is hardly anything unique which separates the election manifesto of one party over the others as it is but obvious that every party and leader, no matter the differences in their political ideology, background or stance; would have a manifesto which talks about development, employment, tackling such issues as terrorism, instability, etc. Hence, it becomes pretty difficult for the voter to understand and differentiate how party A or leader A is unique and stands tall over the opponents. This is very much true for a country like India where the parties fight elections on almost similar manifestos. It is here that the need of political branding and political marketing is felt as they bring about clarity with regard to the various political parties and leaders. This becomes possible due to the various traits of the phenomenon of branding which make it unique. The distinctiveness, a hallmark of branding, comes into the fore in this regard. Hence, it becomes apparent to the political parties that they need to put into practice the various principles of branding which would help them to stay relevant and bring out the distinctiveness which they hold over others.

They have realized that ideological differentiation would no longer serve the purpose and they need to reinvent so as to strike a chord with the voters. Another reason in this regard is provided by Hay (1999), Reeves et al (2006) and Mensah (2011) who point out that in modern politics, voters tend to vote akin to the manner in which they choose commercial brands. What makes the branding angle relevant is the aspect how branding explains some voters perceive and respond to parties. French and Smith (2010) highlight the case of brand-saturated societies like USA where voters could be increasingly found equating political parties with other service brands. In the process, they transfer as well as use their knowledge of consumer brands in the political sphere. Branding explains how parties and leaders approach campaigning and governing thus giving rise to the idea of permanent campaign which views governing as an extension of campaigning for the incumbent.

Branding and its Offshoot Political Branding: The significance of branding lies in the aspect that it should lead to such value creation that the consumer develops an affinity, an emotional connect with the product thereby giving it an edge over its competitors. This is achieved by those organizations which know their target customer well and develop such messages which are simplistic-yet-appealing and more importantly consistent across various media. This is done with the help of research conducted through intelligence. The message conveyed to the target segment should be a reinforcing one and come

across as one no matter on how many platforms print, TV, cinema, OOH, radio, internet, phone) it is played.

Branding has increasingly come to reflect the principles of marketing in a more comprehensive manner and been an effective tool to grab the attention of the customers of goods or service or that of the voter. Political branding is one of those elements which go into the making of the marketing of a political campaign. In today's times, branding has moved beyond the obvious, namely the economic terms and ventured into such unchartered territories as emotional and cultural. The consumers who engage with the brands emotionally tend to prefer them over even superior substitutes. Likewise, the brands who pay much heed to the cultural implications of the society in which they are operating stand a better chance to gain acceptance over those who adopt a plain vanilla approach towards the same. Political branding is based on this premise and takes into consideration such concepts like emotional branding and cultural branding whilst providing the necessary inputs as to how the political parties and leaders could stay relevant in the changing times.

First ones of those who explained political branding; Nakanishi, Cooper and Kassarjian (1974) made a concerted effort towards extending the existing concepts as found in the field of products and brands to the domain of politics. They strived to empirically prove whether some of the techniques and tools as found in consumer behavior could be applied in the domain of politics. Hence, they advocated a consumer-oriented approach towards understanding political branding as compared to a civic-oriented one which was the order of the day (and still is in the developing democracies) more than four decades ago. This implies that political branding is not as recent a phenomenon as we would otherwise believe. However, in countries like India, the phenomenon of political branding has made its presence in the last decade or so thanks to the proliferation of technology and rise of brand Modi in the national political landscape.

Political branding is still in the nascent stage in democracies like India where political parties and leaders are yet to realize its true potential. However, steps in this direction were taken during the last two general elections of 2014 and 2019 when both the camps hired professional experts to manage their campaigns in a never-before way. Use of social media for the same was unprecedented. This is very similar to the usage of social media by former President of USA Barrack Obama first in 2008 and then again in 2012. Many experts believe that the extensive use of social media by Prime Minister Narendra Modi during the past two general elections has lot of bearing to the campaign run by Obama. In fact, the key word "Change" around which the campaign of BJP and Narendra Modi in 2014 was similar to the campaign of Barrack Obama in 2008. Here it would be pertinent to observe that social media is a great leveler.

A political start-up like Aam Aadmi Party was able to garner much mileage on social media as compared to the likes of Indian National Congress, a trait which speaks volumes about the efficacy and transparency of it.

Political branding can be defined in a manner that it incorporates the manifestation which arises due to the perception which the masses develop in favour of (or against as in anti-branding) a political leader (Narendra Modi), party (BJP), strategy employed (Mission 272+ of BJP during the general election of 2014), policies (Ujjawala, Swach Bharat and Jan Dhan Yojana of the 2014 government which struck a chord with the masses), along with such concepts which help the people to understand and identify with a political outfit. For this, the political actors employ hordes of techniques some of which are known as material cues in the form of campaigns, bill boards, political rallies, public appearances, etc. Not only this, to connect with the masses it becomes imperative to connect with them on an intrinsic level in the form of immaterial cues or hints which lie in the categories as trust, awareness, curiosity, belief, interest, relatedness, etc. Along with these two, there are other elements which make a political brand better than the opponents. They could be the symbols, languages, signs, etc. which form and popularize the notions related to a political party.

Marland and Flanagan (2013) have studied the concept of political branding in terms of formation of new party and going about branding it in the Canadian context and came up with the understanding that a branded perspective helps the voters to connect better with the thought-process of the candidate and party thus enabling them towards making informed choices with regard to the candidates in contention for the various posts during an election. Further, in a separate work, Marland (2013) talks about how branded politicians have come to shape up contemporary politics in democracies across the world, its implications and application in the Indian context as advocated by Kumar et al (2009) who talk about applying political branding beyond the western democracies as well as how it influences the participatory tendencies of the consumer-citizens (read voters), a notion advocated by Sonies (2011) wherein he talks about the role of consumers in the branding related aspect of politics and how the same influences their preferences so that they become engaged in the political event called election.

To further the conceptual framework in this regard, branding is seen as something which is crucial to the strategies formed by the parties. It is increasingly seen as a new psychological connection used by voters and a new organizing principle used by parties. Parties tend to become less driven by ideology and more by their work with time. They become the central aspect of political campaigning thus becoming pivotal to political branding. The shift in ideology and change in organization hierarchy and structure, coupled with professionalism, help in developing a market-oriented approach in politics. Like commercial firms, political parties are increasingly using strategic branding. The

role of strategy has become more pronounced than ever. Kotler et al (2005) have argued for creating a commercial brand that "becomes the whole platform for planning, designing and delivering superior value to the company's target customers", a concept which finds much traction as far as political branding is concerned.

Political Branding and its Indian Connect (The Cases of the 2014 and 2019 General Elections): Brand Obama was immensely successful during the USA Presidential elections (first in 2008 and then in 2012 although to a lesser extent). It is uncanny how brand Modi performed on similar lines in India first in 2014 and then in 2019 with a better record. These four instances of application of the phenomenon of political branding in two of the largest democracies in the world are a testimony to the success of political branding being applied on leaders rather than on parties. At the same time, the use of heuristics (mental short-cuts) which assist human beings in making informed choices have to be understood in this regard. Human beings have a tendency to avoid new and complex learning and prefer to stick to the tried-and-tested products. This extends to politics as well. Voters tend to vote in the similar fashion as they had been doing in the past unless convinced otherwise. Hence, a political brand which has been successfully positioned in their minds is quite difficult to remove from their preference as it could be easily recalled when needed. It is an associative network of political attitudes and information which are interconnected to each other.

Brand Modi was much more visible (and hence recallable) than any of the rival political brands during the last two general elections which is an amazing feat indeed bucking the anti-incumbency which a political leader faces during such a major election. In fact, it would not be wrong to say that it far outweighed all the rival brands put together (the final tallies of 282 in 2014 and an even-better 303 in 2019 in the favour of BJP alone out of 543 seats were a testimony of the same). Such was the pull of brand Modi that the alliance partners of National Democratic Alliance of which BJP is the main party were relegated to the background as BJP was able to form the government on its own on both the occasions which is unprecedented in the modern era of alliance politics.

The 'omnipresent' trait of brand Modi irrespective of the platform added brawny points to his claim as the next PM of the country in 2014 and his continuance as the PM in 2019. He was as big challenger in 2014 as he was the seeker of re-election in 2019. His chief rival brand Gandhi was a pale shadow of brand Modi despite Congress making all-out efforts to ensure his better visibility during both the elections, going to the extent of promoting him as the President of the Indian National Congress during the 2019 whereas he fought the 2014 general election in the capacity of Vice-President of the party.

Today, brand Modi is the most popular and followed politician in the world just behind brand Trump, a position he has maintained since he became PM (at that point of time, he was only trailing brand Obama in terms of popularity). The likes of Shinzo Abe, the PM of Japan, and Benjamin Netanyahu, the PM of Israel, follow only a handful of politicians, with Modi being one of them. This says a lot about his might in the political landscape. The online world was as much a buzz, if not more, than the physical one during the lead-up to both the elections. In fact, it was for the first time during the 2014 election that the general election was as much fought in the physical world in terms of rallies and bill boards as in the virtual world of facebook and twitter. This was repeated in 2019 at a much grander scale by all the contending parties and alliances. Here too brand Modi supplanted all the rivals combined. The consistency which came to characterize the projection of brand Modi across the platforms had much to do with the usage of right material cues which were to be found in every possible manner. The consistency with which brand Modi was projected across the various mediums was unprecedented and all this strengthened the tangible aspect of the election.

The Modi juggernaut proved to be much of an ask for its rivals to stop. The screen presence, talk shows, debates, rallies, posters, banners, airtime on TV and radio, presence on the internet. Brand Modi was dominant on all. At the same time, even during the peak of the Modi-wave in 2014 and in 2019, such regional political brands as Mulayam Singh Yadav in Uttar Pradesh and his clan were able to register wins. Likewise, Sonia Gandhi won from her constituency during both the general elections. However, Rahul Gandhi had mixed fortunes in his constituency. Elsewhere, Mamata Banerjee in West Bengal, Late J Jayalalitha in Tamil Nadu (in 2014), Naveen Patnaik in Odisha, KC Rao in Telangana, Jagan Reddy in Andhra Pradesh were able to thwart the impact of the Modi Juggernaut riding on their charisma and personality.

The above-mentioned examples of regional political branding are those which were not a part of the NDA to highlight the pull of regional political brand over a national political brand. Then there were such regional political brands like Shiv Sena in Maharashtra, N Chandrababu Naidu in Andhra Pradesh (during 2014 general election), Ram Vilas Paswan in Bihar, Shiromani Akali Dal in Punjab who were part of the NDA and reinforced the regional with the national brand image. These regional brands benefitted immensely from the pull of brand Modi which was evident from the abysmal performance of the party of N Chandrababu Naidu during the 2019 general election when he deserted the NDA and went alone only to suffer losses in the hands of Jagan Reddy.

When one talks about these instances when a regional political brand took precedence over the national phenomenon going by the name brand Modi in 2014 and in 2019, it is but obvious that the emotional attachment played a crucial role in this regard more than anything else. The voters at such places have their own nicknames for their favoured leaders, Netaji for Mulayam

Singh Yadav, Amma for Late J Jayalalitha, Behenji for Mayawati, Didi for Mamata Banerjee which are hard to replace. The sense of belongingness which they feel with these regional stalwarts is difficult to match, even for someone with the caliber of Narendra Modi.

CONCLUSION

To conclude, the author, through international and national context, talked about how political branding has come to play a role in modern politics by explaining how the concept has originated in the context of the advanced democracies and has been utilized by the political parties for the past many decades in countries like USA, UK, Japan, Australia, etc. However, the significance of the same was understood during the 2014 and 2019 general elections in India when the brand image of Mr Modi took precedence over the rival brands and helped BJP-led NDA reach majority in the lower house of the parliament on both the occasions.

The author talked about the rationale of using political branding in modern politics owing to the lack of differentiation in the image of the political parties and leaders which confuses the voters as to for whom they should vote. In this regard, political branding helps to break the clutter as it results in a distinctive image of the party and leader thereby differentiating it from others. The author highlighted the instances of the last two general elections where on one hand brand Modi juggernaut rolled across the nation and on the other hand there were some of the strong regional political brands who held on their own. To summarize, political branding is the way ahead for the political parties and leaders and those who utilize it prudently stand to gain from it.

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Impact of COVID-19 on Education & the Analysis of the Paradigm-shift of Offline Learning to E-Learning

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ABSTRACT

The Purpose of this investigation is to identify the obstacles of the e-learning education and the change in outlook of the whole education figuring out how to e-learning measure at home because of the unanticipated circumstance with the pandemic COVID-19. It is an exploratory study, and for this the data has been collected to see the various obstacles and the impact of the pandemic COVID-19 on educating and learning in primary schools. In this investigation, the respondents were 15 educators and guardians of two elementary schools in Mathura region. Semi structured questions was created dependent to gather data from the respondents. The discoveries of this examination uncovered a few difficulties and requirements experienced by students, instructors, and guardians in internet learning. This paradigm-shift of learning identified with students were restricted correspondence, socializing, specialized education needs, and longer screen time. Guardians saw the issue was more identified with an absence of learning discipline at home, additional time spent to help their youngsters' learning at home, an absence of innovation abilities, and higher web bills. Educators recognized more difficulties and limitations, remembering a few limitations for the decisions of showing strategies, less inclusion of educational plan content, absence of innovation aptitudes that obstruct the capability of web based learning, the absences of e-assets in bringing about additional time expected to create e-substance, longer screen time because of e-content making and giving criticism.

KEY WORDS: COVID-19, INTERNET LEARNING.

INTRODUCTION

The pandemic COVID-19 is the first and foremost health crisis in the world. Many countries have decided to close schools, colleges, and universities as a precaution measure to its spread. The United Nations (UN) claimed that education is one of the sectors affected significantly by the pandemic. Even worse, school closures happened on a broad scale, and so unprecedented that disturb learning and teaching. The ABC News (March 7, 2020) reported that school closures have occurred in more than dozens of countries due to the COVID-19 outbreak. The UNESCO states that this corona pandemic threatens 577 million students in the world. As a consequence, the government and related institutions must present alternative educational processes to replace face-to-face interaction in a regular class. By mid of March 2020, more and more schools have begun home learning. A few days later, the Indian government released the policy of learning from home for schools and higher education. In a relatively short lead-time, all educational institutions were shifted from face-to-face to online learning. This sudden change resulted in "chaos", especially because students were approaching the national exam in India, which was normally conducted in March, April, or May, depending on their grade level. It was to all related parties' relief that the government announced the cancellation of the National Examination (UN) this year.

The plan was pushed forward to the year 2020 as a response to the COVID outbreak, in line with government regulation about social restrictions. All levels of education from elementary to higher institutions under the Ministry of Education are impacted by such closure. Not all educational institutions are ready for the sudden shift. Some schools may be equipped with some sort of technology embedded in their regular face-to-face class. Even so, they find it quite challenging to upskill their stakeholders with the technology required for distant online learning and teaching in such a short time. Most schools however, do not have such a privilege in terms of resources and facilities for online learning. Such a condition has posed extra challenges to their school communities. Not all students are accustomed to online learning. Moreover, many teachers and lecturers are not yet proficient in teaching using internet technology, especially in various regions in India. The purpose of this study was to obtain information on the impact of Covid-19 pandemic on learning and teaching in schools in Mathura region.

MATERIAL AND METHODS

This research is an explorative case study to obtain information about the consequences of Covid-19 pandemic on learning and teaching in primary schools. The sample size was determined based on the need to achieve depth and wealth of description. In this study, the respondents were 15 teachers and parents of two primary schools located in Mathura region. For confidentiality purposes, respondents are given the initials R1-R15. Profile of Respondents Initial Gender Age Status Education were categorized. Primary data was collected through semi-structured interviews with teachers and parents, while the secondary data was from published articles, journals, and books.

This research is an exploratory case study, and the samples were selected using the purposive sampling method to achieve the research objectives. There is no limit to the number of respondents to make a purposive sample, provided the desired information can be obtained and generated (Bernard, 2002). To conduct a case study research, Creswell (2013) provides some recommendations for observations and sample size, ranging from no more than four to five. In the case study, the respondents are interviewed until data saturation was reached, and no more new information is obtained (Guest et al., 2006; Krysik and Finn, 2010). The interviews were recorded, then verbally transcribed. For the analysis and interpretation of data, thematic data analysis guidelines (Creswell, 2009) are used because it is the most appropriate for any research that seeks to explore several interpretations (Alhojailan, 2012). In the thematic analysis, "all possible interpretations are possible" (Alhojailan, 2012, p. 10). The reason for choosing thematic analysis is that "a rigorous thematic approach can produce in-depth analysis that answers certain research questions" (Braun and Clarke, 2006, p. 97).

After a rigorous analysis, researchers describe the findings in four main themes.

The following interview questions were used to obtain information about the impact or Covid-19 pandemic on learning and teaching:

1. Explain the impact of the Covid-19 pandemic experienced by students related to their learning and teaching activities
2. Explain the impact of the Covid-19 pandemic experienced by parents related to learning and teaching activities
3. Explain the impact of the Covid-19 pandemic experienced by teachers on learning and teaching activities

RESULT

The purpose of this study was to obtain information about the impact of the Covid-19 pandemic on learning and teaching activities in elementary schools in Mathura. The statements are the English translation of participants' original responses without any editing. One of the respondents (R6) stated that "the students are "forced" to do distance learning without any adequate facilities and infrastructure at home" (R6). Another respondent (R5) added, "Students have not had a culture of distance learning yet because so far the learning system implemented is through face-to-face," also "not all teachers are adept at using internet technology or social media as a learning tool". Some respondents mentioned the standards as their main concerns. "No standard system as guidelines for home learning yet" (R3). There is no standard system in supervising students and teachers in the home learning process " (R2). Some respondents expressed their concerns about the extra expense they had to pay. "Extra expense for buying internet quota" (R1). "Need to buy more internet quota" (R4) "Teachers' expenses increase in buying quota." (R3) "Teachers need to buy more internet quota" (R2) Some respondents pointed out problems faced by parents: "As a parent,

I must spend more extra time with my children, helping them with their home learning" (R3). "Parents become teachers for their children." (R1). "I have to learn together with my children." (R3) "I have a headache arranging Zoom schedules of my three children. I always look forward to weekends." (R7) "As a parent and a teacher as well, I have to divide my attention between teaching my sixth-grade students and teaching my own two little children. It is not easy, sometimes." (R14) "Parents of students with special learning needs must closely monitor and help their children." (R15) The impacts on students were said as follows: "Schools have been closed for such a long time, making children bored." (R6) "Children begin to get bored at home and want to go to school soon to play with their friends." (R2) "I think children lose their social life. At school, they can play and interact with their friends, but this time they cannot." (R5) "This

home learning is even harder for students with special learning needs.

In the regular face-to-face class, some of them have had difficulty concentrating, even more in online learning like this." (R15) As for teachers, the responses include the following: "Teachers' expenses increase for quota purchases." (R3) "Teachers feel tired of staying at home and want to return to school to interact with students soon." (R5) "Bored being at home starts to kick in." (R6) I have to work until late at night to prepare for home learning." (R8) "Checking and giving feedback to students took a long time. (R9) As with technology, teachers stated: "I don't know how to do this and that. I need help with technology, and I have to learn fast."(R11) "My internet is unstable at home. I was suddenly logged out from my online class when teaching.

" (R10) Related to the effects on the curriculum and assessment, teachers pointed out some main points: "As an art teacher, I have to find something students can still do at home with materials they can simply find at home. I have to modify my learning outcomes." (R11) "Some aspects of learning cannot be observed, such as their social skills and cooperation. "I understand it is hard for fourth graders to collaborate online. This condition will affect assessment and reporting." (R12) "I cannot cover the learning outcomes as fast as a face-to-face class." (R8) "I have to check with students what sports equipment they have at home before I can plan my PE (Physical Education) class. I try to find something to substitute for the proper equipment." (R13)

DISCUSSION AND CONCLUSION

The respondents' statements were analyzed under students, parents, and teachers for ease of reference. Impact on Students Respondents reported that students feel they were forced to shift to home learning without adequate facilities and infrastructure at home. Laptops, computers, or mobile phones and internet access are crucial for smooth home learning. Respondents from the elite schools said that the obstacle was not on the readiness of the facilities. Students with adequate infrastructure at home may also experience challenges with home learning because distance learning is not part of the learning culture yet. Most schooling depends heavily on face-to-face, with some blended learning in more advanced schools. Students are accustomed to being in school to interact socially and physically meet with their friends. Although the interactive online sessions enable students to meet virtually with their teachers and friends, a respondent who teaches the first graders stated that the interaction is awkward. Not all students responded the same as they normally do in face-to-face interaction. In addition to getting used to socializing through an online platform, students need time to adapt to distance learning.

Some respondents reported it took more teachers' effort than the normal face-to-face class to build students' understanding. The significant increase in children's

screen time also becomes a concern. Participation in synchronous online interactive learning where the class virtually meet and access to asynchronous learning materials posted in the learning platforms used by the schools are at least two of the main reasons for the increase of screen time. Students with special learning needs are struggling with the distance learning setting. A respondent who is part of the learning support team mentioned that most of the students with special learning needs have a shorter attention span. These students are impacted greatly by online home learning.

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Impact of Covid-19 Pandemic on Stock Price across Different Section: An Event Study of Indian Stock Market

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ABSTRACT

This study is an attempt to explore impact of Covid-19 pandemic on the stock prices of various different 19 sectors in India. This study also empirically examines performance of market and their response trend towards pandemic in India. It has been observed after the event study that Covid-19 pandemic has impact on stock price of sector indices. For the purpose of analysis basic tools are used.

KEY WORDS: COVID-19, SECTOR INDICES, BSE.

INTRODUCTION

The year 2020 has been recorded in history due to an event which turned life of common man in several pain, economies around the world, production of companies, income of common man is affected by Novel Corona virus. According to the data released by WHO, The Novel Corona Virus spread over 235 countries, over 4 Crores of confirmed cases have been identified and due to Covid-19 more than 11 lakhs of people died. As per the various report published by different researchers and agencies economies around the world are facing recession and global gross domestic product is going to decline up to 3% in future. WTO has also predicted that global business may fall by 32% due to the impact of corona virus. Many steps are taken by countries around the world but lockdown considered as primary and most effective & preventive measure for Covid-19. Most of

the countries had implemented lockdown and almost half of the population of world were in some kind of restrictions, India, USA, UK, New Zealand and Poland are the example of countries those implemented lockdown (Langton, 2020).

India has implemented lockdown on 24 March 2020 as a strict restriction over the commercial activities. However, lockdown is not a longer strategy to prevent Corona virus among the people but as a short term strategy it may be used to borrow the time for preparing the health facilities. Assessing the impact of Covid-19 Pandemic is very difficult and challenging because it has created economic uncertainty than any other pandemic in recent decades (Baker et al., 2020). Global economy likely to decline sharply in 2020 and many of the economic surveys conducted by various agencies expressed that global economy will contract up to 3% and will grew gradually in the later part of year 2021(World Economic Outlook, April 2020: The Great Lockdown, 2020). Studies conducted by (Bhattacharya, Bhandari and Bairagya, 2020) supply will be effected heavily and this will also effect demand side also which will create demand based recession (Fernandes, 2020; Guerrieri et al., 2020).

Traditional theories suggested that stock prices are affected by market and firm's related factors. When a company face changes occurred in economic environment

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his operating condition is highly correlated with the industry in which they work (Moskowitz and Grinblatt 1999). Theory of behavioural finance suggested that emergencies also have impact over the stock value of a company due to its impact on investor's perception and psychologies. Lee and Jiang (2002) observed that investor perception has impact over the volatility of stock price.

As a pandemic Covid-19 is not only causing death and infection but also have affected stock market in India. In India no. of confirmed cases reached up to 80,00,000 and death up to 1,25,000 with active case of 6,25,000. Empirical studies show that pandemic has severe impact on various sectors of Indian economy such as transportation, Mining, Real Estate while other sectors like education, health, information technology and FMCG responded positively towards pandemic. Our study first, analyse the impact of pandemic on stock prices of various sectors and their response towards pandemic, second our research employs methods of event study to explore the effect of pandemic.

This article proceeds as follow: Second part will deal with Review of Literature, third part with Methodology adopted, Forth part will deal with Analysis and last part will conclude the article.

Review of Literature: our study is focused to explore impact of Covid-19 pandemic on stock price. In capital market the stock price is affected by the investor's behaviours which is a result of various aspects of environment. Health emergency of pandemic usually effect the psychological thinking of the investor and there by stock prices. Study conducted by Fama et al. (1969) can be used to measure the effect of particular event on stock prices. Now a day it has been observed that event study is extensively used in the field of accounting and finance and become most common method for analysis. This existing study focused to analyse the impact of health emergency on stock price of Indian companies. Study of Nikkinen et al. (2008) observed that event of "911" influenced stock prices all over the world. Righi and Ceretta (2011) conducted a study and found that European crisis during 2010 had affected stock price in European countries. Schwert (2011) conducted a study to investigate the effect of financial crisis on US market. in this context, our study aimed to analyse the impact of Covid-19 Pandemic on stock price of Indian companies related to the different sectors.

Table 1. Shows the result of CAR Value during the Lockdown Phase – 1

Event Window	(–11,0)		0,11)	
	car	t – Value	car	t – Value
Auto	0.061698	0.037185	0.296029	0.178416
BANKEX	0.194288	0.11699	0.299523	0.180357
Basic Materials	0.187386	0.1129	0.349142	0.210358
Capital Goods	0.174726	0.10528	0.340826	0.205362
Consumer Durables	0.176875	0.106449	0.43801	0.263609
Energy	-0.0569	-0.03428	0.202032	0.121711
Fast Moving Consumer Goods	0.283325	0.170672	0.467191	0.281431
Finance	0.212603	0.128015	0.301951	0.181814
Healthcare	0.306301	0.184489	0.496358	0.298962
Industrials	0.221019	0.133188	0.350973	0.211499
Information Technology	0.400156	0.24101	0.81199	0.489054
Metal	0.018047	0.010882	0.30913	0.186407
Power	0.222148	0.133843	0.504737	0.304101
Realty	0.05359	0.032257	0.352239	0.21202
Teck	0.406059	0.244561	0.778503	0.468877
Telecom	-0.10563	-0.06354	0.2746	0.165189
Utilities	0.260821	0.157168	0.508792	0.306592
Oil & Gas	0.117136	0.070597	0.342726	0.206558
Consumer Discretionary Goods & Services	0.262597	0.15817	0.394557	0.237654
(Source: Author's Compilation)				

Table 2. Shows the result of CAR Value during the Lockdown Phase – 2

Event Window	(–12,0)		(0,12)	
	car	t – Value	car	t – Value
Auto	0.04998	0.775654	0.034696	0.538446
BANKEX	0.055724	0.817671	0.01938	0.284371
Basic Materials	-0.02113	-0.33492	0.044002	0.697476
Capital Goods	0.046461	0.719073	0.053109	0.821961
Consumer Durables	0.073255	1.244202	0.084268	1.431255
Energy	0.002259	0.033266	-0.01439	-0.21195
Fast Moving Consumer Goods	-0.0514	-0.93571	0.091505	1.665735
Finance	0.063035	0.943641	0.009203	0.137768
Healthcare	-0.11991	-2.23052	0.062913	1.170315
Industrials	0.031464	0.507572	0.035252	0.568673
Information Technology	0.092266	1.549105	0.023457	0.39383
Metal	0.077301	1.076368	0.051969	0.723631
Power	0.074399	1.308747	0.059586	1.04817
Realty	0.167565	2.534811	0.054742	0.828097
Teck	0.068547	1.173791	0.025783	0.441511
Telecom	0.072797	1.026646	0.105292	1.484918
Utilities	0.041374	0.733081	0.047874	0.848254
Oil & Gas	0.016269	0.257824	0.019003	0.301139
Consumer Discretionary Goods & Services	0.047683	0.821508	0.02899	0.49945
(Source: Author's Compilation)				

Table 3. Shows the result of CAR Value during the Lockdown Phase – 3

Event Window	(–10,0)		(0,10)	
	car	t – Value	car	t – Value
Auto	0.03316	0.50208	-0.06637	-1.00492
BANKEX	0.0125	0.179853	0.019566	0.281525
Basic Materials	0.060776	0.97233	-0.05977	-0.95616
Capital Goods	0.083099	1.320355	-0.05124	-0.81418
Consumer Durables	0.088316	1.500808	0.017233	0.292848
Energy	-0.02118	-0.31424	-0.06176	-0.91621
Fast Moving Consumer Goods	0.134311	2.405634	-0.00854	-0.15294
Finance	0.005771	0.085579	0.01531	0.227029
Healthcare	0.085356	1.556201	-0.05212	-0.95018
Industrials	0.060067	0.990417	-0.05378	-0.8868
Information Technology	6.73E-05	0.001128	-0.02883	-0.48339
Metal	0.063326	0.897868	-0.04692	-0.66527
Power	0.088108	1.576268	-0.05382	-0.96291
Realty	0.067429	1.035307	-0.03136	-0.48153
Teck	0.003041	0.051882	-0.04519	-0.77096
Telecom	0.092341	1.31691	-0.11486	-1.63813
Utilities	0.077855	1.397757	-0.03431	-0.61593
Oil & Gas	0.030161	0.479329	-0.02285	-0.36316
Consumer Discretionary Goods & Services	0.042023	0.720032	-0.02831	-0.4851
(Source: Author's Compilation)				

Table 4. Shows the result of CAR Value during the Lockdown Phase – 4

Event Window	(-9,0)		(0,9)	
	car	t – Value	car	t – Value
Auto	-0.05858	-0.90417	-0.02103	-0.32457
BANKEX	0.014	0.204826	0.019622	0.287087
Basic Materials	-0.05174	-0.84591	-0.01935	-0.31632
Capital Goods	-0.0318	-0.52012	-0.00859	-0.14052
Consumer Durables	0.014055	0.242588	0.013052	0.225264
Energy	-0.01858	-0.28302	0.032729	0.498458
Fast Moving Consumer Goods	0.008981	0.164943	-0.03344	-0.61417
Finance	0.006968	0.104612	0.024194	0.363203
Healthcare	0.009711	0.182549	0.013701	0.257553
Industrials	-0.03907	-0.66206	6.08E-05	0.00103
Information Technology	-0.00416	-0.07054	0.00341	0.057897
Metal	-0.03808	-0.54694	-0.00876	-0.12582
Power	-0.0207	-0.37991	0.013348	0.245032
Realty	-0.02153	-0.33827	0.003996	0.062794
Teck	-0.01464	-0.25386	0.003146	0.054555
Telecom	-0.03993	-0.59084	0.040363	0.597302
Utilities	-0.00113	-0.02079	0.006008	0.110669
Oil & Gas	0.008104	0.132947	-0.00263	-0.04307
Consumer Discretionary Goods & Services	-0.02819	-0.49324	-0.02371	-0.41491

(Source: Author's Compilation)

Table 5. Shows the result of CAR Value of continuous Lockdown of Phase – 1 &2

Event Window	(-23,0)		(0,23)	
	car	t – Value	car	t – Value
Auto	-0.21667	-3.69209	0.115425	1.966882
BANKEX	-0.07672	-1.43458	0.090675	1.695414
Basic Materials	-0.15486	-2.94671	0.08932	1.699633
Capital Goods	-0.16637	-3.06266	0.113413	2.087723
Consumer Durables	-0.25515	-5.02989	0.171194	3.374844
Energy	-0.25007	-4.52515	0.064162	1.161034
Fast Moving Consumer Goods	-0.24846	-6.00698	0.075945	1.836114
Finance	-0.05	-0.98071	0.077799	1.525981
Healthcare	-0.30262	-7.14295	0.04623	1.091225
Industrials	-0.10953	-2.13376	0.094533	1.841657
Information Technology	-0.38046	-8.02283	0.190904	4.02562
Metal	-0.24457	-3.67417	0.141847	2.130955
Power	-0.2722	-5.71656	0.154497	3.244592
Realty	-0.22167	-3.5581	0.196914	3.160658
Teck	-0.34823	-7.68504	0.172443	3.805628
Telecom	-0.37569	-5.3607	0.180409	2.574221
Utilities	-0.2571	-5.6163	0.125742	2.746823
Oil & Gas	-0.2281	-4.27712	0.080054	1.501089
Consumer Discretionary Goods & Services	-0.11422	-2.45978	0.095963	2.066585

(Source: Author's Compilation)

Table 6. Shows the result of CAR Value of continuous Lockdown of Phase – 1,2 &3

Event Window	(–33,0)		(0,33)	
	car	t – Value	car	t – Value
Auto	-0.19782	-2.81994	0.042899	0.611527
BANKEX	-0.0769	-1.20796	0.089811	1.410683
Basic Materials	-0.15779	-2.5177	0.020995	0.334985
Capital Goods	-0.16232	-2.49037	0.047897	0.734837
Consumer Durables	-0.25201	-4.19682	0.133116	2.216871
Energy	-0.25661	-3.8813	-0.01132	-0.17121
Fast Moving Consumer Goods	-0.23544	-4.82518	0.040302	0.825947
Finance	-0.04565	-0.7537	0.07854	1.296598
Healthcare	-0.3201	-6.33175	-0.03369	-0.66631
Industrials	-0.10734	-1.74211	0.030468	0.494465
Information Technology	-0.38191	-6.72963	0.11486	2.023939
Metal	-0.25024	-3.18602	0.077294	0.984087
Power	-0.24833	-4.3871	0.080774	1.426993
Realty	-0.19968	-2.6886	0.144255	1.94236
Teck	-0.35263	-6.51131	0.096133	1.775069
Telecom	-0.37926	-4.562	0.079121	0.951711
Utilities	-0.23744	-4.35092	0.061514	1.127215
Oil & Gas	-0.21779	-3.41211	0.028706	0.449745
Consumer Discretionary Goods & Services	-0.10165	-1.83879	0.053643	0.970384

(Source: Author's Compilation)

Table 7. Shows the result of CAR Value of continuous Lockdown of Phase – 1,2,3 &4

| Event Window	(–42,0)		(0,42)	
	car	t – Value	car	t – Value
Auto	-0.14476	-2.33701	0.047479	0.766518
BANKEX	-0.09503	-1.34388	0.115106	1.627751
Basic Materials	-0.16991	-2.44059	0.02412	0.346454
Capital Goods	-0.16805	-2.3495	0.056825	0.794451
Consumer Durables	-0.28868	-4.35715	0.159024	2.40017
Energy	-0.25253	-3.43369	0.032434	0.440998
Fast Moving Consumer Goods	-0.24016	-4.45663	0.016413	0.304576
Finance	-0.05685	-0.85456	0.104712	1.574047
Healthcare	-0.3382	-5.98679	-0.0081	-0.14335
Industrials	-0.11575	-1.7046	0.044958	0.662104
Information Technology	-0.39474	-6.25031	0.143831	2.277447
Metal	-0.25089	-2.89466	0.092805	1.07073
Power	-0.25651	-4.12671	0.108255	1.741606
Realty	-0.2101	-2.61477	0.167852	2.088975
Teck	-0.36519	-6.05326	0.122363	2.028272
Telecom	-0.39827	-4.28408	0.116256	1.250548
Utilities	-0.24776	-4.12247	0.084787	1.410784
Oil & Gas	-0.21781	-3.10801	0.04555	0.649976
Consumer Discretionary Goods & Services	-0.14476	-2.33701	0.047479	0.766518

(Source: Author's Compilation)

Methodology This study aims to find out the impact of COVID-19 pandemic on Indian stock market indices. This event study also explores the abnormal changes occurred due to any event. To examine the impact of pandemic, data has been analysed of nineteen sectors. Data of Indices during first lockdown from 25 March – 14 April, 2020 where the stock market opened for 11 days during this lockdown, in second phase of Lockdown from 15 April – 3 May, 2020 where the market opened for 12 days, in third phase of Lockdown from 4 May –17 May, 2020 where the market opened for 10 days, in forth phase of lockdown from 18 May –31 May, 2020 where the market opened for 9 days have been analysed.

We have also combined the data of indices during the various lockdown period. Data of indices during first and second lockdown from 25th March to 3rd May 2020 have been combined and market was opened for 23 days. Also, we have combined the data of first, second and third lockdown from 25th March to 17th May 2020 where the market opened for 33 days and during the combination first, second, third and fourth lockdown from 25th March to 31st May 2020 during which stock market was opened for 42 days

The sample selected for this study comes from the Indian Bombay stock exchange's Sector Indices of Auto, BANKEX, Basic Materials, Capital Goods Consumer Discretionary Goods & Services, Consumer Durables, Energy, Fast Moving Consumer Goods, Finance, Healthcare, Industrials, Information Technology, Metal, Oil & Gas, Power Realty Teck, Telecom, Utilities. For this study all secondary data has been collected by using the www.bseindia.com. For this study data is collected from the following way.

(Estimate Window)   (Event Window)

T_0 T_1 0 T_2
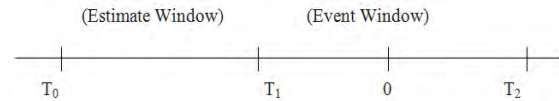
Here for the study estimate window was taken of 250 days. For this event study first calculate the Stock return by using $(S.R. = \ln \frac{t_n}{t_{n-1}})$ where ln means natural log and t_n means the value of stock market on the day n and t_{n-1} means the value of stock market index on previous day.

Market return calculate by using M.R. $\frac{I_n}{I_{n-1}}$ where I_n means the value of sectorial indices on the day and I_{n-1} the value of indices on the previous day.

Normal Return calculate by using the N.R.=$(I_i+\beta_i*M.R.)$, where I_i means Intercept and β_i represent Beta. Abnormal Return calculate by using A.R.=S.R.- N.R. After that cumulative abnormal return before and after event calculate by using the

Table 8. Shows the result of Average of CAR Value								
	Lockdown -1		Lockdown -2		Lockdown -3		Lockdown -4	
	(-11,0)	(0,11)	(-12,0)	(0,12)	(-10,0)	(0,10)	(-9,0)	(0,9)
CAR	0.178749804	0.411543	0.041471	0.044033	0.052975	-0.03726	-0.01612	0.002954
t-value	0.10767558	0.247893	0.632727	0.719634	0.877657	-0.59718	-0.2567	0.041129

(Source: Author's Compilation)

Table 8. A Shows the result of Average of CAR Value (Continue with Previous Table)						
	Lockdown -1-2		Lockdown -1-2-3		Lockdown -1-2-3-4	
	(-23,0)	(0,23)	(-33,0)	(0,33)	(-42,0)	(0,42)
CAR	-0.22488	0.119867	-0.22005	0.061859	-0.22926	0.080113
t-value	-4.38558	2.291404	-3.60175	0.98631	-3.42398	1.160978

(Source: Author's Compilation)

$$CAR_{(T_1,T_2)} = \sum_{T=T_1}^{T_2} A.R.$$

To find out the significant value of the event T-Value of CAR, calculate by using

$$t - value = CAAR_{(T_1,T_2)} = \frac{CAR}{n\sqrt{S.D.}}$$

Above table shows the results of data analysis during first lockdown. Our study indicates that during first lock down period sectorial indices of selected industries were not much effected.

This table represents the results of data analysis during second lock down period. Our study indicates that in this period healthcare sector (t – Value -2.23052) and real estate sector (t – Value 2.534811) was effected.

This table represent the result of data analysis during third lockdown. Our study indicates that in this period FMCG sector (t – Value 2.405634) is influenced. This table indicates the results of data analysis during fourth lockdown and it indicates that there is no impact of this time period on stock indices of selected sectors. This table indicates the result of data analysis of the combination of lockdown one and two. We found that from the time period between 25th March to 3rd May 2020 when the market was opened for 23 days and stock indices of all selected indices are affected by restriction imposed due to pandemic.

This table indicates the result of data analysis of the combination of lockdown one and two. We found that from the time period between 25th March to 17th May 2020 when the market was opened for 33 days and stock indices of all selected indices are affected by restriction imposed due to pandemic. This table indicates the result of data analysis of the combination of lockdown one and two. We found that from the time period between 25th March to 31st May 2020 when the market was opened for 42 days and stock indices of all selected indices are affected by restriction imposed due to pandemic. In the above table average value of all the sectors during all lockdown period has been taken for analysis and found that all the nineteen sectors are having impact of Covid-19 pandemic.

CONCLUSION

This is very important to know the effect of events on stock indices in India. Our study was an attempt to analysis the impact of Covid-19 pandemic as an event on stock indices. During the examination we found that event always influenced the stock indices in any stock market. it is also found that stock indices may not influence by event in short period but in long period it will influence the stock indices.

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Exploring Cultural and Spiritual Values —A Way to Effective Conservation

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ABSTRACT

The epidemic disease COVID 2019 caused by SARS-CoV- 9 (Severe Acute Respiratory Syndrome Coronavirus 2) has affected the population of almost all the countries with severely shutting down their social, financial, and even corporate life (GDP of almost all countries declined during this pandemic period). This disease is highly contagious and spreads through one to one contact (physical closeness) [5]. It spreads through the air in the form of small droplets transmitted from an infected person's breath, cough, sneeze, or even when verbal communication [16]. More than one million deaths and almost 40 million cases across 188 countries have been reported to date [17]. The various methods include maintaining proper hygiene by washing hands frequently, keeping unwashed hands away from the face, avoiding public places, and maintaining social distancing being adopted to curb the contagious disease. This paper formulates and solves numerically the modified SIERD model with vital dynamics. The study enumerates the importance of social distancing factor in curbing the spread of the disease and also cautions about the second wave. Also, the importance of mortality due to the disease δ, in reducing the death by giving timely medical interventions is shown numerically.

KEY WORDS: SEIRD, SARS-COV-2, COVID-19, EPIDEMIC, BASIC REPRODUCTION NUMBER.

INTRODUCTION

Mathematical modelling is a useful tool to understand the mechanism of the spread of infectious disease into a population. The future course of an outbreak and measures to control an epidemic can also be predicted through such modelling. The SIR model originated in the early 20th century and important work was done in [10]. The model which is based on the compartment theory defines three major compartments as Susceptible, Infectious, and Recovered (SIR). Using first-order non-linear differential equations, this model predicts the spread of the disease or the total number infected and recovered as a function of time. Also, it estimates epidemiological parameters such as the reproductive number [3]. The SIR model [12,14] is one of the simplest compartmental models, and many models are derivatives of this basic form.

The model consists of three compartments: S(t) is the number of susceptible individuals that come into contact with infectious I in time t, contracts to the disease, and the individual transits to the infectious compartment. I(t) is the number of infectious individuals in time t who have been infected and are capable of infecting susceptible individuals. R(t) is the number of individuals removed (and immune) or deceased in time t i.e. who have been infected and have either recovered from the disease and entered the removed compartment or died. The compartments S, I, R are called Susceptible, Infected, Recovered, respectively [4]. The Susceptible-Exposed-Infectious-Recovered-Deceased Model is a modified SIR model that distinguishes between Recovered (ultimately immune for a given period) and Deceased. In this model, the mortality proportion factor is taken into account to quantify the medical facilities.

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Mathematical Model: Consider the SEIRD epidemic disease model, where the total initial population is divided into five compartments namely, S(t) Susceptible, E(t) Exposed, I(t) Infected-infectious and R(t) Recovered, D(t) Deceased/death, where t is the time variable. We formulate the problem based on the SEIRD model with vital dynamics and study the effect of social distancing and mortality proportion factor. Let N be the total number of humans in the system at time t, S is susceptible to be exposed, and E is the actual number of exposed individuals (a compartment in which the disease is latent; infected but not infectious); people move from the compartments of susceptible S to the compartment of exposed I depending on the number of contacts infected I individuals, multiplied by the probability of infection (β) and ρ is the probability factor due to social distancing (ρ=1, means no social distancing) (Figure 1),

where βI/N is the average number of contacts with infection per unit time t of one susceptible person). The other processes taking place at time t are: the exposed (E) becomes infectious (I) with a rate α and the infectious recover (R) with a rate γ. Recovered means an individual who may flow back into the class S (susceptible) after a certain period t, as in COVID 19, there is no possibility of lifelong immunity, in spite that it will develop antibodies in the recovered person but remain active for a restricted period. The reciprocals α–1, γ–1, and μ–1 are the average disease incubation, infectious periods, and average deaths related to infectious disease, respectively. Λ and μ describe a model with vital dynamics (endemic model), which has an inflow of births into the compartment S at a rate Λ and outflow of deceased into any other compartment, say Y at rate μY. This model is based on the assumptions proposed by Hethcote [8] in 1976; the population size is constant and large enough so that we can consider the population of each compartment as a continuous model. The birth and death rates are equal and the population (fixed) is homogeneously mixed and uniform.

The governing differential equations are:

$$\frac{dS}{dt} = \Lambda N - \frac{\rho \beta S[t]I[t]}{N} + \sigma R[t] - \mu S[t], \quad (1)$$

$$\frac{dE}{dt} = \frac{\rho \beta S[t]I[t]}{N} - \alpha E[t] - \mu E[t], \quad (2)$$

$$\frac{dI}{dt} = \alpha E[t] - (\gamma + \delta + \gamma)I[t], \quad (3)$$

$$\frac{dR}{dt} = \gamma I[t] - \mu R[t] - \sigma R[t], \quad (4)$$

$$\frac{dD}{dt} = \delta I[t], \quad (5)$$

where,

$$N(t) = S[t] + E[t] + I[t] + R[t] + D[t]. \quad (6)$$

The parameters are defined as:
Λ: Birth rate per unit time.
μ, δ: Natural and virus-induced average fatality rate per unit time, respectively.

β: Probability of disease transmission per contact (dimensionless) times the number of contacts per unit time.

α: Rate of progression from exposed to infectious (the reciprocal is the incubation period) in per unit time.

γ: Recovery rate of infectious individuals (the reciprocal is the infectious period) having units of (1/T), with time T.

The choice Λ = μ = 0, ρ = 1and neglecting D[t] gives the classical SIR model [10], if Λ and μ are not zero, the model is termed a SIR model without vital dynamics or endemic SIR model [1]. However, the SIR model has no latent stage (no exposed individuals), so it is inappropriate to consider it as a model for diseases like COVID-19. This model is given in Kermack–McKendrick's theory [10, 13]. Being a high fatality rate, we have introduced another compartment D(t) because after being infected, two possibilities may arise, either a patient recovers or dies.

Fig. I: SEIRD Model with Vital Dynamics
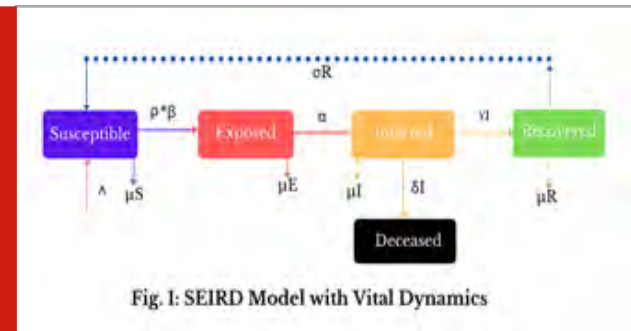
The SEIR model has many versions and mathematical treatments can be found, for instance, in Diekmann et al. [7], Hethcote [8], Keeling, and Rohani [9], among others. The goal is to compute the number of susceptible, exposed, infected, recovered, and deceased individuals based on the number of contacts, social distancing factor, and the probability of disease transmission, incubation period, recovery rate, and fatality rate along with the proportion of fatality. This epidemic disease model predicts a peak of susceptible, exposed, infected, and recovered or deceased individuals per day as a function of time. The population will decrease due to the disease depending on the fatality rate of the disease. Various epidemiological factors have been studied including lockdown [6, 14].

The μ, defined as the number of natural deaths and δ as the mortality rate due to the viral disease are important

metrics as the death rate due to the virus is 2% for elderly people and those having other medical complications. The deaths are quite high in the age group of more than 60 years, this can go up to 10%, and in a country having a population of 1.34 billion. The 10% death rate [17] for a particular age group is significant and should be avoided by taking considering different measures like social distancing, hygiene, medication, etc. Thus, in this study, we restrict our study to the deaths attributable to the infectious disease rather than complicated by natural deaths and other morbid diseases.

Reproduction Ratio: The basic reproduction ratio, R0 (Al-Sheikh[2]) is associated with the reproductive power of the disease. It gives the average number of secondary cases of infection generated by an infectious individual. Therefore, it is used to estimate the growth of the virus outbreak. R0 provides a threshold for the stability of the disease-free equilibrium point. When R0 ≤ 1, the disease dies out; when R0>1, an epidemic occurs. The disease-free equilibrium is that point of the stage at time t where the infection reduces to zero i.e. I = 0, from (2) we obtain (S, E, I, R, D) as (Λ/μ, 0, 0, 0, 0). Using the Jacobian matrix method on the dimensionless form of the equations (1) – (6), obtained dividing by N.

$$\frac{dS}{dt} = \Lambda - \rho\beta S[t]I[t] - \mu S[t] + \sigma R[t], \qquad (7)$$

$$\frac{dE}{dt} = \rho\beta S[t]I[t] - \mu E[t] - \alpha E[t], \qquad (8)$$

$$\frac{dI}{dt} = \alpha E[t] - (\mu + \delta + \gamma)I[t], \qquad (9)$$

$$\frac{dR}{dt} = \gamma I[t] - \mu R[t] - \sigma R[t], \qquad (10)$$

$$\frac{dD}{dt} = \delta I[t], \qquad (11)$$

and $N(t) = S[t] + E[t] + I[t] + R[t] + D[t].$ (12)

We obtain, the characteristic equation using (7) – (11) and discuss the stability of the system:

$$\frac{\lambda(\lambda+\mu)(-(-\gamma-\delta-\lambda-\mu)\mu(\alpha+\lambda+\mu)-\alpha\beta\Lambda\rho)(-\lambda-\mu-\sigma)}{\mu}$$

The Eigen values are:

$\lambda_1 = 0$

$\lambda_2 = -\mu - \sigma$

$\lambda_3 = -\mu$

$\lambda_4 = \frac{1}{2\mu}\left(-\alpha\mu - \gamma\mu - \delta\mu - 2\mu^2 - \sqrt{\mu}\sqrt{\alpha^2\mu - 2\alpha\gamma\mu + \gamma^2\mu - 2\alpha\delta\mu + 2\gamma\delta\mu + \delta^2\mu + 4\alpha\beta\Lambda\rho}\right)$

$\lambda_5 = \frac{1}{2\mu}\left(-\alpha\mu - \gamma\mu - \delta\mu - 2\mu^2 + \sqrt{\mu}\sqrt{\alpha^2\mu - 2\alpha\gamma\mu + \gamma^2\mu - 2\alpha\delta\mu + 2\gamma\delta\mu + \delta^2\mu + 4\alpha\beta\Lambda\rho}\right)$

As $\lambda_1 = 0$, $\lambda_i < 0$ for i =1, 4 and if $\lambda_5 < 0$, therefore,

$$\sqrt{\mu}\sqrt{(\alpha^2\mu - 2\alpha\gamma\mu + \gamma^2\mu - 2\alpha\delta\mu + 2\gamma\delta\mu + \delta^2\mu + 4\alpha\beta\Lambda\rho)} - (-\alpha\mu - \gamma\mu - \delta\mu - 2\mu^2) < 0 \quad (13)$$

Also, $\alpha^2\mu - 2\alpha\gamma\mu + \gamma^2\mu - 2\alpha\delta\mu + 2\gamma\delta\mu + \delta^2\mu + 4\alpha\beta\Lambda\rho > 0$

$= \mu(\alpha - \gamma)^2 + \mu(\delta - \alpha)^2 + 2\gamma\delta\mu + \delta^2\mu + 4\alpha\beta\Lambda\rho > 0$, which implies that λ_5 is a real value.

On solving (13), we obtain

$$-4\left(\alpha\gamma\mu^2 + \alpha\delta\mu^2 + \alpha\mu^3 + \mu^3(\gamma + \delta + \mu)\right) + 4\alpha\beta\Lambda\mu\rho < 0$$

$$\Rightarrow \qquad R_0 = \frac{\alpha\beta\Lambda\rho}{\mu(\mu + \alpha)(\gamma + \delta + \mu)} < 1 \qquad (14)$$

Since all $\lambda_i < 0$ for i = 2, 5 but $\lambda_1 = 0$, therefore system is marginally stable [15].

On solving, equations (7) – (10), we obtain,

$$S = \frac{\Lambda}{R_0\mu}, \qquad (15)$$

$$E = \frac{(-1 + R_0)\Lambda(\gamma + \delta + \mu)}{R_0\left(\alpha\gamma\mu + \alpha(\delta + \mu) + \mu(\gamma + \delta + \mu)\right)} = (R_0 - 1)(\gamma + \delta + \mu)\xi, \qquad (16)$$

$$I = \frac{(-1 + R_0)\alpha\Lambda}{R_0\left(\alpha\gamma\mu + \alpha(\delta + \mu) + \mu(\gamma + \delta + \mu)\right)} = (R_0 - 1)\alpha\xi, \qquad (17)$$

$$R = \frac{(-1 + R_0)\alpha\gamma\Lambda}{R_0\left(\alpha\gamma\mu + \alpha(\delta + \mu) + \mu(\gamma + \delta + \mu)\right)} = (R_0 - 1)\alpha\gamma\xi, \qquad (18)$$

$$D = \frac{\delta(-1 + R_0)\alpha\Lambda(\mu + \sigma)}{R_0\left(\alpha\gamma\mu + \alpha(\delta + \mu) + \mu(\gamma + \delta + \mu)\right)} = (R_0 - 1)(\mu + \alpha)\alpha\xi, \qquad (19)$$

Where,

$$\xi = \frac{\delta}{R_0\left(\alpha\gamma\mu + \alpha(\delta + \mu) + \mu(\gamma + \delta + \mu)\right)}$$

Thus, for R >1 the Infectious I > 0, and hence the system is endemic equilibrium.

Global stability of a SEIRD model: The Equation (7), (8) and (9), assuming σ=0, then terms of R(t) [11] and also D(t) doesn't appear in it (as D doesn't appear in equation (7)-(9).

$$\frac{dS}{dt} = \Lambda - \rho\beta S[t]I[t] - \mu S[t]$$

$$\frac{dE}{dt} = \rho\beta S[t]I[t] - \mu E[t] - \alpha E[t],$$

$$\frac{dI}{dt} = \alpha E[t] - (\mu + \delta + \gamma)I[t],$$

And R(t) and D(t) can be obtained from

$$R[t] = N[t] - (E[t] + I[t] + R[t] + D[t])$$

$$\frac{dD}{dt} = \delta I[t].$$

The feasible region for the above equation is

$$\boxed{?} = \{(S, E, I) \in \mathbf{R}_+^3 : R + E + I \leq \frac{\Lambda}{\mu}\}$$

which is positively invariant. Let R0 be defined as in (2). It is clear that the disease-free equilibrium (DFE) P = {Λ/μ, 0, 0} exists for all values of parameters.

It is the only equilibrium in P if R0 ≤ 1. If R0 > 1, a unique endemic equilibrium P* = (S*, E*, I*) ε Θ exists with equation (15) - (17).

Theorem 1: The DFE P = (Λ/μ, 0, 0) of Equations (10) - (12) is globally asymptotically stable in Θ if R0 ≤ 1 and is unstable if R0 > 1.

Consider a Lypunov function

$$L = \alpha E + (\mu + \alpha) I, \text{ if } R_0 \leq 1, \text{ using (12) - (13)}$$

$$\dot{L} = \alpha\beta S - (\mu + \alpha)(\mu + v)I \text{ as } S \leq \Lambda/\mu$$

$$\leq \frac{\alpha\beta\Lambda}{\mu}(1 - \frac{1}{R_0})I \leq 0$$

And L = 0 if and only if I = 0. Therefore, by La Salle's Invariance principle [8], the above system Θ is globally stable.

Theorem 2: If R0> 1, then the region D – {(S, E, I, R)/I = 0} is a globally asymptotically stable region for the endemic equilibrium P*.

The constant population size assumption enables us to remove the R related terms. The proof is available in

Global stability in some SEIR epidemic models [15].

Numerical Analysis of Modified SEIRD Model with Vital Dynamics: In many cases, the solution of non-linear ODE's by using standard numerical methods may not be possible. We have used NDSolve of Mathematica to solve the simultaneous non-linear differential equations. We have modified the SEIRD model by introducing two factors:

Social Distancing
b. The mortality factor due to the disease (Non-availability of medical intervention). A fraction of the population ρ uses social distancing by using masks or other means while the rate of mortality due to disease is δ. μ is the natural death of susceptible, exposed, infected, or recovered population.

Fig.2: Daily Susceptible, Exposed and Infected using SEIRD Model (ρ=1.0)

Fig.3: Daily Susceptible, Exposed and Infected using SEIRD Model(ρ=0.6)

Fig.4: Daily Susceptible, Exposed and Infected using SEIRD Model(ρ=0.4)

Fig.5: Daily Infected, Recovered and Deceased using SEIRD Model(δ=0.01)
Fig.6: Daily Infected, Recovered and Deceased using SEIRD Model(δ=0.1)
Fig.7: Daily Infected, Recovered and Deceased using SEIRD Model(δ=0.2)
Fig.8: Daily Infected, Recovered and Deceased using SEIRD Model(δ=0.5)

The equations (7) – (12) have been solved using NDSolve of the Wolfram Mathematica. We study the effect of the introduced factors ρ and δ, respectively in the above-defined model by varying its values.

For different values of ρ =1, 0.6 and 0.4 the graphs are plotted for Susceptible S[t], Exposed E[t] and Infected I[t]. It is found that social distancing plays an important role. For ρ = 1, when there is no social distancing and (ρ = .8, ρ = .6) if the social distancing is increased (β decreases), then there is a difference of more than 50% in the peak values of Susceptible S[t]. The social distancing has a dampening effect on Exposed E[t] and Infected I[t] where not only the peaks are flattened but the graph shifts right side which means the effect of the disease is advanced. The peak values for Infected and Susceptible at ρ = .8 are less than 20 and 10 respectively. Similar patterns are seen in the graphs of Recovered and Deceased. Consider different values of the mortality rate δ = 0.01, 0.1, 0.2, .5. The graphs are plotted for Infected I(t), Recovered R(t), and Deceased D(t).

The graphs show that increasing δ, defined as a mortality factor due to disease increases the peak of Deceased D[t]. By providing the medical facilities to the needy patient of the disease at right time, the mortality factor δ can be controlled. The peak of Recovered is also reduced while there is no change in Infected. Another important observation is the absence of social distancing and other measures allow the transmission of Coronavirus, another wave with a lesser amplitude is expected after a current wave is over (Fig.3- Fig.5). This can be weakened only by taking appropriate measures of social distancing.

CONCLUSION

The two parameters ρ and δ which are related to social distancing and mortality explicitly due to the disease, respectively have been studied. It is found that social distancing plays an important role. The number of exposed consequently infected and the deceased population remains controlled if ρ is reduced

(with ρ=1 is the complete absence of social distancing factor). Another wave and subsequent waves with a lesser amplitude are expected after the current wave is over; this can be weakened only by taking appropriate measures of social distancing. It has been shown that the medical interventions for infected individuals play a vital role in reducing the mortality rate δ and hence more patients will recover from the infections.

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Exploring Cultural and Spiritual Values —A Way to Effective Conservation

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ABSTRACT

Social and Spiritual qualities have been recognized as a basic variable for deciding the preservation in a powerful manner. This examination is a work to research the cultural and spiritual worth arising contemporary wonders to see how protection normally can create values in the public arena. An endeavor is made to build up the connections between preservation bodies and the Cultural and Spiritual Values along these lines prompting more successful activity on the ground. The possibility of the current examination is to know the development openly worry for nature and the climate regarding plants.

KEY WORDS: CULTURAL AND SPIRITUAL VALUES; CONSERVATION; SOCIETY, ENVIRONMENT.

INTRODUCTION

Nature protection can be the idea of as a social and profound quality attempting to create or reassert certain qualities in the public eye concerning the human instinct relationship (West, Igoe, and Brockington, 2006; Adams and Hutton, 2007). Social qualities are sets of goals and convictions to which individuals separately and all things considered try and which they want to uphold. They structure the customs, establishments, and laws that support social and profound qualities. In our view, the appropriation, dismissal, and adjustment of qualities through open discussion and different cycles legitimizes social and profound qualities and makes social solidness and quality vocations. Social and profound qualities are casual assortments of people and offices that expressive

specific worth sets whose selection, they accept, will make a 'superior' world (McCrae, 1996).

Our anxiety is that overemphasis on master drove science and financial realism as a way to convey the objectives of preservation clouds a few qualities and stresses others. Levelheadedness as the variation of intends to closes. The important finishes for financial aspects and science in preservation are material riches and natural wellbeing, separately. Nonetheless, humankind's arrangement of substantial finishes is more varied and incorporates, for instance, passionate and spiritual prosperity. Accordingly, to keep up energetic social and profound qualities, preservation strategy needs to support these significant circles of human worry close by the more restricted monetary and instrumental qualities (Sütterlin, Brunner and Siegrist, 2011). Besides, the authenticity of the protection development to work globally, we propose, is established on the mix of:

- The worth of the social and profound qualities upheld;
- The conviction that they are values with general allure and that all social orders, social and profound qualities for better appropriation;
- The participation base of associations unmistakable in the development;
- The status of people advancing the reason.

Chambers and Conway (1992) suggested that the qualities drove protection is an activity to review the equilibrium, and give new arrangement and social importance to the preservation development in the 21st century. It is established on the acknowledgment that activity to secure nature happens when contentions are outlined in wording that resounds with the blend of creative mind, emotions, and judiciousness that direct dynamic in individuals' regular daily existences. Dependence on logical argumentation alone dangers distancing the individuals can have other substantial inspirations for preservation. This can dig in sensations of frailty and fuel thoughts of inconvenience by a 'foundation'. Pauwels (2010) observed that the conversely, social qualities are more diverse and draw on a comprehensive mix of culture, science, and social vision. In our view, the function of logical data is to educate and help convey social plans not to decide them.

Cultural and spiritual values are basic main thrusts in nature protection and social and profound administration. However, are regularly hard to speak to in dynamic cycles. The social significance of normal social and spirituals comprises substantial merchandise and ventures, yet additionally incorporates numerous frequently theoretical, non-material, or data administrations (Fairholm, 1996). These non-material and profound qualities are important for neighborhood individuals' cosmovision and assume a crucial part in forming their impression of nature. The manner in which individuals see nature relies upon the socially characterized worth and conviction frameworks that structure a significant, regularly intergenerational, wellspring of data. A portion of this important data, relating specifically to its spiritual measurements, may not yet be considered in current social and profound administration. Part of the explanation behind this might be that such information is unavailable and hard to be perceived by outcasts, for example, western-prepared traditionalists and regular cultural and spiritual chiefs. Subsequently, representing the different perspectives and they're comparing social and profound qualities in the act of cultural and spiritual administration frames a test for administrators, strategy producers, and nearby individuals the same (Phipps, 2012).

India's Cultural and Spiritual Values: Increasing degradation of unconventional ideas promote conservation. In his ongoing book, E. O. Wilson advocates monitoring half of the planet for one animal type and the other half for the excess a great many species. The rundown of "best puts on the biosphere" deserving of sparing incorporates the congregation woods of Ethiopia and the holy forests of the Western Ghats in India and Bhutan. Segments of these social and spirituals stay unblemished today to some extent since they were viewed as holy by the indigenous individuals. Hallowed common destinations are a pivotal part of biodiversity protection, yet they stay hard to represent in most worldwide biodiversity board organizations. They have been furiously secured by social and strict convictions and restrictions for a long time without government or nongovernmental-association oversight. So, they speak to an extraordinary protection accomplishment for the planet, particularly in non-industrial nations where ordinary financial measurements make some harder memories picking up a foothold.

Latest evaluations of Cultural and profound qualities organize the financial estimations of different administrations including freshwater, carbon stockpiling, creation of nourishments and building materials, drugs, gas trade, and profitability from daylight, soil preservation, shade, and biodiversity territory (Hawken, Lovins and Lovins, 2013). Generally social and profound administration appraisals disregard the spiritual worth which is truly harder to gauge with financial measurements. The achievement of Bhutan's "gross satisfaction record" (GHI) is because of broad Cultural and spiritual qualities preservation. The spiritual and cultural value isn't just basic in extension yet additionally predicts to have the best potential for huge global protection activities, based on their profound noteworthiness.

India's Qualities towards Plants: India's indigenous individuals overwhelmingly practice Hinduism, in which the Bhagavat Gita lectures that nature protection and nature love are the significant-good commitments (Sivakumar, 2018). Truly, before the production of sacrosanct forests and the love of God as a divinity in a built sanctuary, the custom of adoring trees existed. Indeed, even today, Hindu family units light a light before one of a few consecrated trees, or if nothing else heavenly basil plant, and love them. It is hard to see a sanctuary without in any event one Ficus religiosa tree (named peepal), which was the species expected by Lord Krishna, as per the Bhagavat Gita. In different sanctuaries, fans feed wild fishes, which Hindus accept are a manifestation of Lord Vishnu. In Sringeri (a focal Western Ghats biodiversity hotspot), more than 50 hectares of the River Tunga have been proposed as a fish safe-haven by the sanctuary heads to secure the leader fish species mahseer (Tor khudree) and over twelve endemic upland riverine fishes.

Hindus accept that all animals made by the Lord Brahma are equivalent to people and that expired human spirits are reawakened as different creatures, making creatures (like trees) extremely consecrated (Kandel, 2012). Chronicled proof, nonetheless, doesn't clarify how revering a couple of trees ventured into securing whole backwoods. It might have been a procedure to prevent British rulers from the boundless feeling of India's essential timberlands. It has been informed that the British rulers respected and loved the indigenous

network's conviction that a few backwoods houses the spirits of the neighborhood gods, so they left such woods immaculate. This may clarify why more than 1 million hallowed timberlands stay unblemished across India. The ruler cobra (Ophiophagus hannah) is a god of numerous consecrated forests in the conditions of Kerala and Karnataka that have a place with the lower-rank networks, which likewise shows how the religion is straightforwardly associated with the protection of an undermined animal varieties.

Most consecrated forests are as yet overseen by the joint Hindu families or sanctuary believes, except if the joint-family idea deteriorates and the property rights go under debate (Dasgupta and Symlieh, 2006). A mix of consecrated forests into the state-claimed secured territories—by giving operational independence to the nearby networks—is a reasonable answer for guarantee proceeded with woods assurance. The Kerala state government offers monetary help to the fence and secure more than 5000 sacrosanct forests in the state. India's soppinabetta woods are under the immediate control of a solitary Hindu family, making the aegis of religion a solid mainstay of their preservation. Soppinabetta woods were made by the British leaders of the Madras Presidency as a measure to battle deforestation tension on the state-claimed timberlands in the focal Western Ghats. Areca producers (Areca catechu) were distributed 8 sections of land of woodland per 1 section of land of areca plantation. Today, these woods remain sources to gather leaf litter and green foliage for manure at time stretches that establish a reasonable ranger service practice (Smethurst, 2010).

Ethiopian Church Sacred Values: As opposed to Hinduism, the Christian way of thinking generally encourages that mankind has domain over nature and that all other living things have been made for its utilization. In the absolute most profitable tropical pieces of the world (e.g., Latin America, Asia, and a few pieces of Africa), Europeans, under the aegis of the Church, colonized and cleared the woodlands to develop elastic, cacao, espresso, tea, pepper, and cardamom. Notwithstanding, the Ethiopian Coptic (Christian Orthodox) authority moderated woods encompassing each congregation since they accepted that clerics ensure the human soul just as the entirety of God's animals. Called "church backwoods," these little wraps of essential timberland (some more than 1000 years of age) give significant cultural and spiritual administrations, including freshwater springs, pollinators, nectar, therapeutic plants, local seed banks, conceal, plant materials utilized for painting wall paintings, kindling, and building materials.

Be that as it may, the significant explanation behind their security is spiritual: Church woodlands are the network center point of each rustic locale, and the living minister is a regarded network pioneer. This significant strict idea has secured the congregation backwoods for some ages, while the leftover 95 percent of northern Ethiopia's scene has been cleared for farming (Agegnehu and Dawa, 2015). At present, these congregation backwoods are under

some danger of shrinkage because of infringing cows that feed on the seedlings inside, kids looking for kindling, and encompassing agrarian practices. Endeavors to assemble stone dividers, with a solid network and strict help, have become a significant answer for the protection of chapel woods, and on the grounds that these dividers are endorsed by the ministers, they are an ideal scene characteristic for the neighborhood individuals.

While numerous Western nations follow a lesser strict otherworldliness in the twenty-first century, most of the non-industrial nations (which likewise house the majority of important tropical backwoods) actually organize profound qualities concerning their characteristic assets. These less-created nations likewise have lower per capita pay, more slow financial development, and typically fewer government assets assigned to protection. So in what manner can worldwide preservation approaches coordinate spiritual qualities into woodland monetary portfolios? Potential arrangements may incorporate growing the fruitful GHI of Bhutan, whereby base up or nearby backwoods preservation endeavors have been embraced by the top-down initiative of a whole nation.

Another arrangement could include sloping up profound timberland esteems as a worldwide measurement, conveyed by the United Nations Educational, Scientific, and Cultural Organization; IUCN; or another global administration body (Noyes Jr, 1946). Furthermore, third, maybe some kind of wellbeing credits could be given by gatherings, for example, the Gates Foundation to locales where backwoods preservation prompts improved human wellbeing. Or on the other hand, shouldn't something be said about what might be compared to carbon credits for strict pioneers who advance timberland preservation through their spiritual teachings? Maybe the number of petitions conveyed inside consecrated woods could be converted into dollars and pennies. The spiritual estimation of backwoods is grasped by billions of partners and merits a more prominent need in making manageable timberland preservation arrangements.

Social and Spiritual Values in Conservation Approaches: The balance between nature and culture is intervened through the sacrosanct. This balance is upset when the most noteworthy type of mindfulness – profound cognizance – is taken out from human instinct connections. Today, the 'Thousand years Cultural and profound Assessment' just as the 'Worldwide Environmental Outlook' (Schomaker, Trinczek and Korte, 2008) perceive that culture, otherworldliness, and the hallowed are dynamic co-makers of biodiversity just as significant drivers of human improvement measures. It has gotten clear that neglecting to perceive cultural and spiritual qualities can worsen irreconcilable circumstances between nearby people groups and preservationists and reliably hamper protection destinations. Consequently, it is critical to recollect that in its very quintessence the significance of moderating the variety of life on earth – for human prosperity just as for inherent reasons – is regularly supposed to be founded on the moral

and good grounds where life itself is held consecrated (Verschuuren, 2012).

Perceiving social and profound qualities is fundamental for regarding the holiness of life and in doing so the protection of hallowed regular destinations has consistently appeared to yield improved outcomes for the preservation of spiritual and social variety. Legitimate acknowledgment of hallowed common locales and their spiritual qualities has added to more viable preservation of the executives in various cases around the world. For instance, in northern Australia, the Jawoyn Traditional Owners cases of social and profound qualities appended to Coronation Hill at last held off uranium mining since they thought harming the site would bring destruction and chronic sickness upon all humanity. Legitimate acknowledgment of their cases empowered the protection status of the site which is presently mostly remembered for Kakadu World Heritage Site and National Park. In different cases, for example, that of the Windward Maroons in Jamaica, the acknowledgment of sacrosanct characteristic locales has improved the advancement of all-encompassing administration of the normal and social estimations of secured zones.

CONCLUSION

The connections between social and profound variety lead to a condition of awareness that makes us human. This paper endeavors to propose that upgraded affectability to the association among cultural and spiritual variety can help social orders find new methodologies for preservation all in all and explicitly for the protection of hallowed normal sites. In request to reestablish basic profound connectives that perseveres in the connections among individuals and nature, other than the usually perceived mainstays of supportability 'individuals', 'planet' and 'benefit', a fourth column – 'otherworldliness' – may be thought of. Making individuals mindful of the holiness of nature requires raising awareness of profound qualities that are found in conventional perspectives as well as among the individuals who overwhelm the present current worldwide society. Thusly, exercises gained from and for hallowed common locales may help with improving the human instinct connections of the planet's expanding metropolitan populace. Commitment to natural and practical methods of living remaining parts the main point of interest to the achievement of preservation and the endurance of humankind all in all. Otherworldliness is a vital estimation of holy common locales and hence fundamental to the reclamation, preservation, and security of the normal and social qualities these spots speak to.

At present in nature protection and social and profound administration, expanding significance is set on the full scope of qualities identified with scenes and social and spirituals. Other than the numerous capacities that (secured) territories and social and spirituals by and large add to human prosperity through what are prevalently called social and profound merchandise and ventures, there is developing acknowledgment of the way that these social and spirituals and scenes are seen in totally different manners by various individuals and partners.

Regularly impression of social and spirituals are socially incited and implanted into perspectives that are inextricably associated with the climate. This has ramifications for the manner in which recognition assumes a part in choosing markers, pointer rules, and their application in observing frameworks and the board. A working meaning of cultural and spiritual qualities is given by this commission that can be nitty-gritty and applied through appraisal of a) oral customs and articulations, including language as a vehicle of the theoretical; b) social legacy; c) performing expressions; d) social practices, ceremonies, and merry occasions; e) information and works on concerning nature and the universe; and f) conventional craftsmanship in their relationship to nature, specifically, relations to frameworks of land use, customary biological information and social and profound administration. Of exceptional centrality are SNSs since they structure an extraordinary occasion to remember cultural and spiritual qualities for ensured territories and social and profound administration.

SNSs regularly hold high biodiversity esteems, and hence can go about like a conventional vehicle for securing and improving social and profound capacities and plant variety. They likewise add to protection endeavors and the improvement of 'individuals comprehensive; the board destinations, ecological instruction, diverse learning, and intergenerational transmission of plant information. Despite the fact that SNSs are frequently central purposes of social and profound qualities, they are all the while regularly part of special perspectives of indigenous and neighborhood individuals. Notwithstanding, cultural and spiritual qualities identified with nature, as caught by the idea of plant variety, stretch out to any culture or society in some structure.

Contingent upon the administration model of the ensured territory and the harmony between the strengthening of indigenous individuals and investment in administration, indigenous individuals should have the option to impart the significance of their cultural and spiritual qualities that were applicable to the administration goals. Following the order of biological, socio-practical, and social qualities, the standards (and significance of models) for choosing reasonable markers can differ extensively. Above all else, the measures rely upon how these qualities are seen by neighborhood individuals. Neighborhood and indigenous individuals should be engaged with the way toward creating, choosing, and estimating those pointers.

In the best-case scenario, privately based methods for choosing what is significant for the board should be regarded and affirmed. To survey the social significance of normal social and spirituals, headways in valuation science are expected to represent the different social and conviction frameworks that structure the linkages among cultural and spiritual execution and human

prosperity. Given the intricate idea of perspectives and especially their social and profound measurements, inventive participatory administration methodologies are additionally required. Specifically, while figuring the executives' targets dependent on social and profound qualities, it is of basic significance to comprehend these qualities in their socio-social setting. While overseeing socially critical social and spirituals it is similarly essential to perceive the cultural and spiritual qualities and remember them for appraisal and observing methodologies.

Creating reasonable markers to illuminate the executives on the state or state of the current qualities can be a confounded errand. Before choosing pointers, the measures that structure the reason for choosing markers must be explained. It is contended that these measures change with the kind of qualities the market is relied upon to reflect. When simultaneously estimating profound variety and spiritual centrality at various standards will apply to choosing appropriate markers. Decisions about qualities credited to social properties just as the validity of related data sources may vary from culture to culture, and even inside a similar culture. It is along these lines impractical to base decisions of qualities and validness inside fixed models. At last, incorporating holy locales in preservation endeavors must be accomplished while doing this across physical and institutional outskirts, in and outside secured zones. Hence, remembering hallowed locales for all ensured zone classifications expands on their intercultural and cross-cutting qualities that, thus, produce evenhanded collaborations among social and normal variety on the side of preservation targets.

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A Comparative Study on Traditional and Digital Payment Methods in India (Mumbai

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ABSTRACT

After the demonetization people in the country faced cash crunch and this was the biggest opportunity for E wallet, digital payments systems and banks for promotion of cashless transactions or Digital payment. Also, the Government of India took the effort to promote cashless transactions by limiting cash transactions up to 2 lakhs, promoting BHIM, UPI and more use of credit and debit card transactions and direct benefit transfer to beneficiary's bank accounts. This study examines the Individual perception towards digital & traditional payment methods.

KEY WORDS: TRADITIONAL PAYMENTS, DIGITAL PAYMENTS, EDUCATION, INDIVIDUAL PERCEPTION (MUMBAI).

INTRODUCTION

In the ancient times barter system was used instead of monetary payments.as minting of coins started monetary payments started. Monetary payments are used in exchange of goods and services. In monetary payments system one has to carry hard currency i.e. cash/coins. But after the internet revolution came new type of payment system came into existence i.e. digital payments. In digital payment method both payer and payee use digital platform to transfer and receive money hence there is no need to carry hard cash (currency). BHIM-UPI, Paytm, PhonePe, Google Pay (Tez), Freecharge, YONO by SBI, debit/credit cards are some of the examples of digital payment plaforms which are widely used in India.

ARTICLE INFORMATION

Literature Review

- Shamsher Singh BanarsidasChandiwala Institute of Professional Studies, Dwarka, New Delhi, India have expressed their view in the research paper titled "Study of consumer perception of digital payment mode", that announcement of demonetization created a great opportunity for digital payment platforms in India and the digital wallet companies grabbed this opportunity. Demonetization has made digital payments available to Indian consumers as an alternative to cash.Due to cash crunch in market people turned to digital payments.

- Prof. Sana Khan, Ms. Shreya Jain has expressed her view in the research paper titled "A Study on Usage of E-Payments for Sustainable Growth of Online Business" that in today the internet usage has increased & people are consuming and producing lots of data every second. E-Payment systems like credit/debit card, e- wallets, net banking etc. has led to decrease in cash payments. At the same time there are growing concerns amongst digital payment users about fraud, data privacy.

- The World Bank expressed in their research paper titled "Cash vs. Electronic Payments in Small Retailing (Estimating the Global Size)" that WBG and the World Economic Forum conducted a collective

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analysis of new cases of electronic payment adoption and usage by small merchants. This study aims to identify the digital gap and the value of cash transactions that could move to digital payments globally with a focus on formal micro, medium & small retailers.

- BurhanUl Islam Khan, Rashidah F. Olanrewaju, AsifaMehraj Baba, Adil Ahmad Langoo, Shahul Assad Department of ECE Kulliyyah of Engineering IIUM, Malaysia expressed in his research paper titled "A Compendious Study of Online Payment System: Past Developments, Present Impact and Future Considerations" that the arrival of e - commerce together with the growth of the internet promoted the digitalisation of various online payment methods. A comprehensive survey on all the aspects of digital payment has been conducted after analysis of several research studies on online payment systems. Various elements affecting the adoption and usage of digital/online payments has been analysed in this study.
- Sonia Sharma has expressed in her research paper titled "A detailed comparative study on e-banking VS traditional banking" that the e-banking system is a system which enables financial transactions i.e. bills payments, fund transfer, information on available balance. Online/Internet banking also called as E-banking. Banks have moved to digital world; this change has made the businesses to change or remodel their operations.

Research Gaps Identified
1. Research has been done only on digital payments but till now no research paper has been done comparing traditional and digital payments.
2. Factors that influence the methods of payment.

RESEARCH METHODOLOGY

Scope of the study: The geographical area of the study was limited to Mumbai city of the State of Maharashtra only.

Objective of the study
The study aims to concentrate on and anticipate the following objectives.
1. To study Individual convenience with respect to traditional payments method and digital payments method.
2. To study the factors affecting use of traditional and digital payments.

Hypothesis of the study: On the basis of the review of literature and discussions with various respondent to payments methods, the following Hypothesis are formulated.

H_0: There is no impact of education on the Individual perception towards traditional and digital payment method.
H_1: There is impact of education on the Individual perception towards traditional and digital payment method.

Variables of the study:
Dependent variables: Individual Perception

Independent variables: Education

Techniques of Data Collection: The data was collected through primary sources. The primary data was collected with the help of survey form circulated amongst the respondents.

Sampling size: The survey was conducted randomly amongst 120respondents from Mumbai City. Respondents were from different age group, different educational background and different professions.

Statistical tool size: Questionnaire: In the questionnaire part, the researcher has framed a questionnaire based on the objective of the study in which respondents has given their views.

Statistical tools: Toanalyze the hypothesis, following test is applied to the result:

ANOVA Test: The researcher has used ANOVA test as there are one independent variable and one dependent variable in the study, One way ANOVA test has been applied for the study.

Limitation of Study: Utmost care was taken during selection of topic, planning of study methods and techniques, data processing and analysis. Despite this the study is not free of limitations.

Following are the limitations:
1. Availability of adequate published data in the area of research was one of the limitations.
2. This research study has not considered the challenges faced during digital payments by respondents from rural areas.
3. The study was limited only to Mumbai.

Diagram 1. Education of the respondents	
Education	Respondent
Under Graduate	15
Graduate	57
Post Graduate	38
Others	10
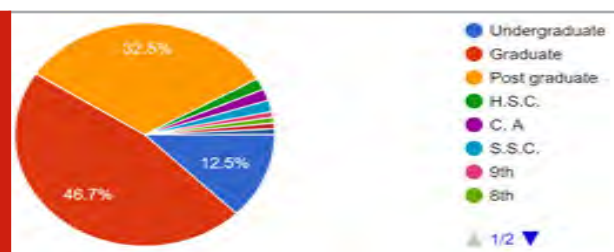
Data interpretation
Part A: Data Interpretation

From the above table and pie chart it is inferred that maximum respondents were graduate, followed by post graduate, under graduate and others.

Diagram 2 : Preference towards Digital Payment and Cash Payment.

- Flexibility
- Easy payments
- Convenience of not carrying cash
- Prefer Cash Payment
- Cash payment

From the above diagram we can conclude that the respondents are more using digital payments than cash payments due to benefits of digital payments.

Diagram 3: Most used Applications.

Most used applications
120 responses
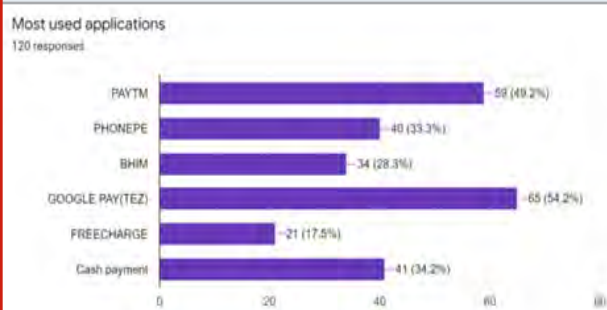
From the above bar graph, we conclude that Paytm, Google Pay (tez), PhonePeare most used applications than cash payments.

Diagram 4: Level of Preference

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree
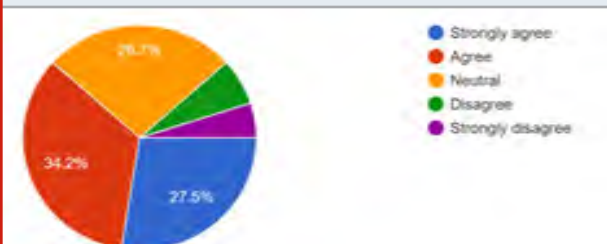
Diagram 5: Digital applications helps classify purchases for budgeting.

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly disagree
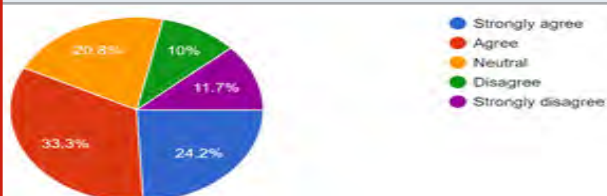
From the above diagram we understood that the responses of the respondents towards digital payments is more than the cash payments.

From the above we can conclude that digital payment applications help classify purchases for budget.

Table 1. Preference level towards Digital Payments.

Level of preference towards digital payments.

Education of the respondent.	Mean	N	Std. Deviation
1) Under Graduate	2.36	15	0.862
2) Graduate	2.35	57	0.807
3) Post Graduate	2.38	38	0.812
4) Others	2.5	10	0.929
Total	2.43	120	0.807

The mean of the samples taken is 2.43, Standard deviation is 0.807 and it is less than 10, hence it can be inferred that it has low standard deviation from the mean.
Part B:

Data analysis: testing of hypothesis.

H_0: There is no impact of age on the Individual perception towards traditional and digital payment method.
H_1: There is impact of age on the Individual perception towards traditional and digital payment method.

	ANOVA Preferences for digital payments.				
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	10.768	3	3.589	3.424	.020
Within Groups	121.598	116	1.048		
Total	132.367	119			

Interpretation: Above result indicate that significance value i.e. 0.020, is less than the level of significance i.e. 0.05. F-test is not accepted. Hence null hypothesis is not accepted and alternate hypothesis is accepted.

CONCLUSION

From the above data analysis, it is concluded that:
- There is an impact of education as graduate, post graduate respondents prefer more for digital payment method whereas undergraduate respondents prefer for traditional (cash) payments.
- Individual prefer more digital payment due to flexibility and easy payments and convenience of not carrying cash as compared to traditional payment method.

Findings: Based on the result of one-way ANOVA conducted, it can be inferred that:

1. Maximum respondents graduates followed by post graduate, under and others.
2. Respondents are more using digital payments than cash payments due to benefits of digital payments.
3. Paytm, Google Pay (tez), PhonePeare most used applications than cash payments.
4. Responses of the respondents towards digital payments are more than the cash payments.
5. Digital payment applications help classify purchases for budget.

Recommendations: There is future scope of the study where the area of the study can be extended across India. The above topic can also be done with respect to individual's income level. To promote digital payments digital infrastructure needs to be developed in villages.

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A Modified Genetic Algorithm for Multiple Sequence Alignment

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ABSTRACT

In this paper, a modified crossover and mutation operator is used in Genetic Algorithm (GA) to solve Multiple Sequence Alignment (MSA). There are two different modified operators have been used in this proposed method. A window frame crossover operator in place of conventional crossover operator and an island shift mutation operator in place of simple mutation operator. A number of benchmark data sets have been used to compare the results between proposed method and Conventional Genetic Algorithm. Due to modified operators proposed method produce good results in comparison of conventional GA. Proposed method perform better in most of cases than Conventional method.

KEY WORDS: GENETIC ALGORITHM, MULTIPLE SEQUENCE ALIGNMENT, WINDOW-FRAME CROSSOVER, ISLAND-SHIFT MUTATION, PROGRESSIVE METHOD, ITERATIVE METHOD.

INTRODUCTION

The conventional multiple sequence alignment algorithms [1] are classified into two categories: iterative improvement strategies and simulated annealing methods. Recently, a genetic algorithm has been used in computational molecular biology as a powerful combinatorial optimizer. A genetic algorithm has been applied to the problem [2-3] of multiple sequence alignment on a parallel computer. In a simple genetic algorithm, a solution of a given problem is represented as "chromosomes" which consists of bit strings of 0's and l's. The genetic operations, such as reproduction, crossover and mutation, are applied to a population of chromosomes to create a new population

of chromosomes. This process is repeated many times so that we can obtain a nearly optimal alignment. Here, we propose an improved method to apply a genetic algorithm to the problem of multiple sequence alignment.

Literature Review: MULTIPLE sequence alignment is an alignment problem in which the amino acid or protein sequences which participate are more than three. MSA can help us to solve many biological problems. MSA can find similarity between sequences, which is helpful to know the function and structure of similar protein or amino acid sequences. It is useful to suggest primary and secondary structures of RNAs and proteins. However, MSA maximizes the matching component as well as minimizes the mismatching component, which is problematic. MSA can reconstruct phylogenetic tree. We can also predict the function of unknown amino acid sequences using the phylogenetic tree. The MSA problem must be dealt with in the efficient manner. Because there are many problems in bioinformatics such as finding ancestral and hereditary relationships, which can be solved by MSA. This algorithm is useful to solve pair wise sequence alignment problem.

DP can also solve the MSA problem and give an optimal solution. MSA problem is solved by dynamic programming (DP) proposed by Needleman and Wunsch [4] in 1970. But the process consume too much of time. Specially if the number of sequence is huge or the length of sequence is large. So MSA problem Became NP-Hard and DP is not feasible for the solution of MSA Problem. For this problem we now required new algorithm. Progressive alignment [8,10] can solve The MSA problem by systematic way. This approach is less complex in terms of time and space for solving the MSA problem. This method has used repeatedly Needleman and Wunsch algorithm to find guide tree between MSA. The progressive [5-7] alignment method initially aligns more similar sequences, after which it incrementally aligns more dissimilar sequences or groups of sequences in the initial alignment.

Figure 1: The Window Frame crossover
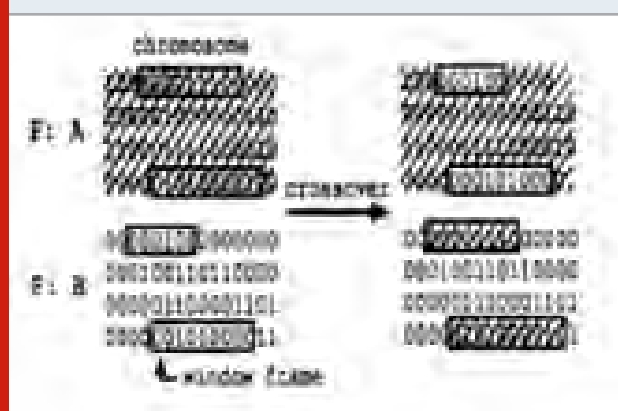
Figure 1: The Island-shift mutation
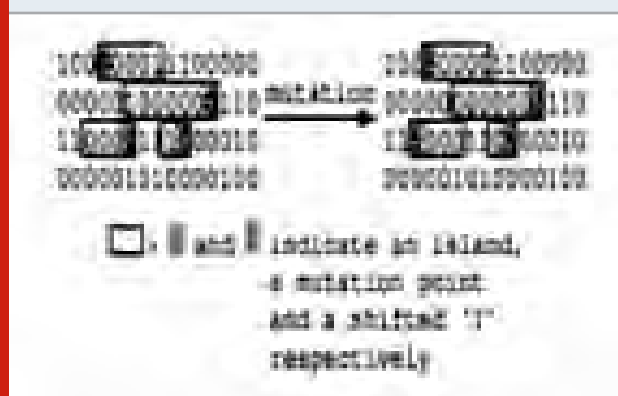
To perform this we have to first assign weights to every pair of sequences in a partial alignment. Weights are assign for the most similar sequences and big weights for most divergent sequences. CLUSTAL W [9] is the standard representation of the progressive method. In second step we take substitution matrix which shows the score of two residues of a protein sequence based on similarity and we can find the difference. In step three two types of gaps are introduced. The first is locally residue gap penalties and second is residue-specific gap. These steps are freely available and are integrated to CLUSTAL W.

Progressive alignment method performs better for MSA package in terms of accuracy and time, but this method is also having some limitations - choice of scoring scheme and dependency on initial alignment. Or we can say that we need to align more similar sequences in the initial stage.

Table 1. Performance test GA with improved and simple operator

DATASETS	Simple GA	Modified GA
1sbp	0.678	0.865
1r69	0.811	0.935
1tgxA	0.854	0.865
1ajsA	0.491	0.511
1ped	0.714	0.675
Avg score	0.709	0.770

If we do not do this, the solution may be trapped in local optima. An iterative [11-12] method initially starts with a random solution and improves the solution in an iterative manner until no more up gradation is possible. Genetic Algorithms (GAs) [13-15] are biological inspired technology, which performs optimization techniques and randomized search guided by with help of Genetics and natural evolution. Gas [20-21] is an efficient, adaptive and robust search process which produces near optimal solution.

MATERIAL AND METHODS

We applied a genetic algorithm to the problem of multiple sequence alignment based on Goldberg's simple genetic algorithm. We define a chromosome as a N x M bit matrix of which elements are strictly 0 or 1. A sequence, including gaps, in an alignment is represented as a bit string which consists of 0 and 1. In this bit string, '1' corresponds to a gap, with the total number of '0's being exactly the length of the sequence. The alignment is expressed with a matrix, which is a vertical arrangement of the bit strings.

Bit matrices as the first population are prepared in a random way: an element in each bit matrix is randomly determined to 0 or 1. The next population is generated by applying three genetic operations: reproduction, crossover and mutation. The reproduction operation creates the next population from the matrices in the first population with use of tournament selection and similarity score. Next, "window-frame" crossover operation as shown in Figure 1 exchanges partly the information between two parents matrices selected randomly: the correspondence of each amino acid residue is strictly conserved in this operation. Then, "island shift" mutation operation as shown in Figure 2 is applied to bit matrices in the next population: in this operation the resulted disorders in the amino acid residue correspondence are limited only in small regions of the bit matrix, i.e. "islands". These processes are carried out repeatedly to obtain a nearly optimal alignment.

Table 2. Experiments on reference 2 datasets of Bali base 2.0

Dataset	PRRP	SB-PIMA	HMMT	DIALI	SAGA[16]	RBT-GA	GAPAM[17]	PROPOSED
2trx	0.87	0.85	0.739	0.734	0.87	0.982	0.986	0.965
1sbp	0.231	0.043	0.214	0.043	0.374	0.778	0.765	0.789
1havA	0.52	0.259	0.194	0.000	0.448	0.792	0.879	0.912
1uky	0.351	0.256	0.395	0.216	0.476	0.625	0.808	0.815
2hsdA	0.404	0.39	0.423	0.262	0.498	0.745	0.796	0.835
2pia	0.767	0.73	0.647	0.612	0.763	0.730	0.826	0.883
3grs	0.363	0.183	0.141	0.350	0.282	0.755	0.746	0.794
Kinase	0.896	0.755	0.749	0.692	0.867	0.712	0.799	0.946
1ajsA	0.227	0.000	0.242	0.000	0.311	0.892	0.899	0.956
1cpt	0.821	0.184	0.388	0.425	0.776	0.584	0.875	0.964
1lvl	0.772	0.62	0.539	0.783	0.726	0.567	0.781	0.791
1pamA	0.711	0.393	0.53	0.576	0.623	0.66	0.86	0.923
1ped	0.881	0.651	0.696	0.773	0.835	0.78	0.912	0.936
2myr	0.582	0.727	0.443	0.84	0.825	0.675	0.822	0.925
4enl	0.668	0.096	0.213	0.122	0.739	0.812	0.896	0.897
1aboA	0.256	0.391	0.724	0.384	0.489	0.812	0.796	0.916
1idy	0.37	0.000	0.353	0.000	0.548	0.997	0.989	0.946
1csy	0.35	0.000	0.000	0.000	0.154	0.735	0.764	0.952
1r69	0.675	0.675	0.000	0.675	0.475	0.9	0.965	0.811
1tvxA	0.207	0.241	0.276	0.000	0.448	0.891	0.92	0.902
1tgxA	0.695	0.678	0.622	0.63	0.773	0.835	0.878	0.944
1ubi	0.056	0.129	0.053	0.000	0.492	0.795	0.767	0.856
1wit	0.76	0.469	0.641	0.724	0.694	0.825	0.851	0.795
Average Score	0.541	0.379	0.401	0.384	0.586	0.777	0.851	0.889

Table 3. Experiments on reference 3 datasets of Balibase 2.0

DATASET	PRRP	SAGA	DIALI	HMMT	SB-PIMA	RBT-GA	GAPAM	PROPOSED
1uky	0.139	0.269	0.139	0.037	0.083	0.35	0.468	0.612
kinase	0.783	0.758	0.650	0.478	0.541	0.697	0.828	0.969
1ajsA	0.128	0.186	0.000	0.006	0.000	0.18	0.311	0.541
1pamA	0.683	0.579	0.683	0.169	0.546	0.525	0.835	0.895
1ped	0.679	0.646	0.641	0.172	0.450	0.425	0.775	0.844
2myr	0.646	0.494	0.272	0.101	0.278	0.33	0.813	0.567
4enl	0.736	0.672	0.050	0.050	0.393	0.68	0.8	0.897
1idy	0.000	0.364	0.000	0.227	0.000	0.546	0.601	0.714
1r69	0.905	0.524	0.524	0.000	0.000	0.374	0.709	0.789
1ubi	0.415	0.585	0.000	0.366	0.000	0.31	0.386	0.539
1wit	0.742	0.484	0.500	0.323	0.645	0.78	0.758	0.851
Average Score	0.532	0.506	0.314	0.175	0.267	0.472	0.662	0.747

Experimental Study: Here we have compared Genetic Algorithm (GA) with simple operator and GA with modified operator. These modified operators generate improved fitness function and this improved fitness function help to produce better results in terms of Bali score. To verify the effect of improved fitness function, we have run the algorithm GA with simple operators and GA with modified operators for some data sets.

WSPM Matrix is used for calculating fitness score. For this, we have taken 3 data sets from reference set 2 and 2 datasets from reference set 3. These set of experiments surely prove that efficiency of proposed algorithm. Here are details in table 1.

Comparing proposed method with some other existence methods; we have taken 23 datasets from reference set 2 and 11 datasets from reference set 3.

Experimental results of reference 2: There are 23 datasets [18-19] from reference set 2, which are totally different to each others in terms of length and behaviours. To judge the performance of proposed method, compare proposed method with some others well known existing methods. The experimental results show that in most of cases proposed method is better than other existing methods and where proposed method is not obtained better solution at least close to better solution.

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CONCLUSION

In this paper, there are two modified operators crossover and mutation has been used for solving MSA problem. To prove the efficiency of proposed method, A large number of experiments have been tested. The proposed method also compare with simple genetic algorithm to prove the superiority of modified operators. The proposed method was optimized based on the sum of pair score, and this is used as a fitness function. Several benchmark datasets from Bali base 2.0 is used in this paper. Therefore, the corresponding Bali score of best score out of ten runs was used to compare with other methods. The experimental results show that proposed method performs better and/ or competitive most of time. These modified operators are reason behind the proposed method is better than the other existing methods.

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A Novel Device for The Diagnosis of The Anemia Disease

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ABSTRACT

As we know in this era 2020 COVID is create a huge change in our life. Due to COVID-19 normal life is change in to the new life where every one is taking the safety precaution. So As we know Anemia is very dangerous disease and as per COVID if any person is having those kind of disease so there is chance of high risk. As we know In this present era Anemia is global health problem, Anemia is a very big issue for present era. The World Health Organization (WHO) estimates that some two billion people are anemic. As per the medical science there is lots of way to detect the Anemia, but most of the approaches are based on Invasive approach. In this paper we try to figure out most of the Novel approach which is able to check the Anemia by using of machine learning approach for the detection of Anemia In this paper we did the complete study and the comparative analysis between present & previous existing process which require the hardware device. In terms of result analysis, we use two parameters which are time complexity and accuracy. As per Our proposed approach we use redberry pi as a processing system where we apply the machine learning concept by using of python and through the human nails we try to figure out the anemia disease.

KEY WORDS: INVASIVE, NON- INVASIVE, SPO2, HARDWARE, DEVICE.

INTRODUCTION

Contamination with extreme intense respiratory disorder Covid 2 (SARS-COV-2) regularly brings about Coronavirus infection 2019 (COVID-19), a sickness that jeopardizes excessively the old, those with prior persistent conditions, for example, cardiovascular illness, diabetes mellitus and hypertension(1, 2). In the event that breaking down, Covid-19 can prompt sepsis, septic stun, and various organ brokenness condition, with mechanical ventilation or extracorporeal film oxygenation having low helpful efficacy(3). The pathophysiological foundation hidden decay and low viability of normal medicines is muddled. Most patients with COVID-19 who require serious consideration will build up an atypical type of the intense trouble respiratory disorder (ARDS) with safeguarded lung gas volume (4), proposing hypoxia because of physiological cycles other than alveolar brokenness may assume a function in the anticipation of the disease(5). Upset iron digestion might be one such influenced measure. To be sure, late information show that COVID-19 patients will in general present diminished hemoglobin levels demonstrating the presence of frailty, and neurotically expanded degrees of ferritin.

An investigation of 67 COVID-19 patients in Singapore detailed that during their course in an emergency unit), (patients grew more significant and essentially lower hemoglobin levels, contrasted with patients not admitted to ICU(6). Another investigation in older patients

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hospitalized for COVID-19 found that most patients had hemoglobin levels lower than the ordinary reach, yet didn't discover critical contrasts in hemoglobin levels among survivors and non-survivors. Notwithstanding, development was fragmented for half of the patients(7). In a report of 5700 patients hospitalized for COVID-19 in the New York City region, ferritin levels were neurotically high, a finding in accordance with past investigations from China (8, 9). Both pallor and hyperferritenemia, paying little mind to the hidden pathology, are solid indicators of mortality(10, 11). Pallor could be the consequence of iron-confined erythropoiesis emerging from changes in iron digestion. Expanded ferritin levels could be characteristic of a solid provocative response in COVID-19 or identified with viral passage into the human body and its effect on iron metabolism(12, 13).

Iron is a fundamental micronutrient for the two people and pathogens(14). The inborn resistant reaction could limit iron accessibility during diseases to deny its microorganism, an instrument that would likewise prompt sickliness (15, 16). Weakness, thusly, lessens oxygen conveyance to the tissue and may accordingly assume a significant part in the turn of events of multi organ disappointment. In this way, it is significant to comprehend the connection between sickliness, iron digestion and movement of COVID-19, and whether these affiliations vary by age, sex and presence of ongoing conditions. A New Method and a Non-Invasive Device to Estimate Anemia Based on Digital Images of the Conjunctiva Anemia is an overall general clinical issue with huge implications for human prosperity. The World Health Organization (WHO) assesses that around two billion people are iron inadequate, which is dened as Hb centers that are underneath the recommended edges [17], [18]. Feebleness is dened as a reducing in the red platelets hovering in the blood or as a decrease in the centralization of Hb: thus, it is a diminished limit of the blood to move oxygen. It starts fundamentally from healthy factors (iron deciency, supplements and minerals), overwhelming ailments (wilderness fever, intestinal parasites) or genetic segments (hemoglobin opathies) [19], [20]. These factors can occur in separation yet are constantly related.

Iron deciency Anemia is the most notable dietary deciency, and it causes countless passings (allianceanemia.org); it is moreover obligated for extended terribleness and mortality in pre-more youthful understudies and pregnant women. In 2002, iron deciency Anemia was seen as among the main contributing parts to the overall load of affliction [21]. Shortcoming has a moderate headway: normally, no obvious signs appear for Hb>9-10 g/dl, since the human body executes compensatory parts, for instance, growing the proportion of blood siphoned, with the goal that the proportion of oxygen released to the tissues remains basically unaltered. Right when the compensation can at this point don't guarantee a good segment of oxygen, signs, for instance, shortcoming, whiteness, fractiousness, extended heartbeat, lack of sleep, cerebral agony and various others appear. The clinical report, when in doubt, is dubious and difcult to portray. Likewise, Anemia is consistently not broke down or enough treated in unending patients for whom it is a critical peril factor (checking mortality) and has a signicant influence on the individual fulfillment. Despite its etiology, since an outrageous degree of Anemia deals the cell oxygen openness and causes hurt that goes from damage to vital organs to a conceivably risky condition, all around, iron lacking patients must be bonded reliant on their Hb level, which can uctuate bit by bit.

Iron insufficiency is assessed by assessing the level of Hb, a protein in the red platelet that is the most reliable pointer of Anemia, since Hb supplies oxygen to the sum of the cells of the body. Standard clinical techniques to dissect Anemia essentially rely upon the meddling confirmation of blood Hb, which requires venepuncture performed by a clinical overseer or a specialist. Visit blood reviewing prompts the patient's misery, and the need of embarking to an examination place or calling a clinical guardian incorporates critical expense. Undoubtedly, it is of mind blowing excitement to think about strategies and to design instruments to screen the intermingling of Hb in a noninvasive way, with lessened costs, both in the lab and at the patient's home, to a great extent even step by step. Various assessments show unprecedented energy for the whiteness of body parts to survey Anemia. For example, Aggarwal et al. [22] analyzed the authenticity of palmar whiteness for the finding of Anemia among kids developed 659 months. Tsumura et al. [23] considered skin concealing and surface assessment/mixture by eliminating Hb and melanin information in the skin. Also, [24] reports focuses on the association among skin and Hb. Spinelli et al. [25] took a gander at the assessment of palmar and conjunctival whiteness to distinguish Anemia: they found that there was a more conspicuous level of affectability to conjunctival pallor than to palmar whiteness. Various examinations found connections between's clinical signs, for instance, pallor to Anemia; in [26],

Kalter et al give the accommodation of clinical signs in the disclosure of Anemia, which proposes the chance of adding conjunctival whiteness to the Integrated Management of Childhood Illness (IMCI), a framework expected to diminish kid mortality and bleakness in making countries. Hasan et al [27] and Wang [28], [29] present picture getting ready of a ngertip video to explore the association between the image pixel information and particular (Hb) levels. Additionally, for this circumstance, the measure of Hb is immovably inuenced by the shade of the skin or by essential tanning. For quite a while, specialists in like way practice have assessed Anemia in people by viewing the eyelid conjunctiva. This preparation is so far endless in numerous upset districts of the earth. Viewing the eyelid conjunctiva can offer information to suspecting Anemia, as a couple of examinations suggested.

In [30], the proximity of conjunctival whiteness was utilized for Hb affirmation, and the makers showed up at 95% isolation precision among iron inadequate and non-slight patients subject to an evaluation of

conjunctival pallor, considering a cut-off of 90 g/L for the Hb obsession. A similar procedure is depicted in [31], The nearness of iron deficiency in an individual can be a sign of different sicknesses like jaundice and absence of nourishment. The location of iron deficiency can serve to demonstrate the nearness of different ailments also. The rest of the paper is organized as follows. Necessary literature survey related previous research on Medical Tool to Estimate Anemia are given in II detection based previous work are given in section ii whereas section III Describes Methodology & Implementation For The Previous Existing Approaches. Experimental results and its analysis are given in section IV. Finally, section V concludes the paper.

LITRECTURE REVIEW: A New Method and a Non-Invasive Device to Estimate Anemia Based on Digital Images of the Conjunctiva Anemia is an overall general clinical issue with critical implications for human prosperity. The World Health Organization (WHO) assesses that around two billion people are iron inadequate, which is dened as Hb centers that are underneath the proposed edges [1], [2]. Delicacy is dened as a reducing in the red platelets hovering in the blood or as a decrease in the centralization of Hb: thus, it is a diminished limit of the blood to move oxygen. It starts essentially from healthy factors (iron deciency, supplements and minerals), overwhelming ailments (wilderness fever, intestinal parasites) or inherited segments (hemoglobin opathies) [3], [4]. These factors can occur in separation yet are constantly related. Iron deciency Anemia is the most notable dietary deciency, and it causes countless passings (allianceanemia.org); it is furthermore at risk for extended terribleness and mortality in pre-more youthful understudies and pregnant women. In 2002, iron deciency Anemia was seen as among the main contributing parts to the overall load of infirmity [5].

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to investigate Anemia essentially rely upon the nosy confirmation of blood Hb, which requires venepuncture performed by a clinical overseer or a specialist.

Visit blood assessing prompts the patient's pain, and the need of embarking to an exploration community or calling a clinical guardian incorporates critical expense. For sure, it is of unbelievable energy to think about strategies and to design instruments to screen the intermingling of Hb in a noninvasive way, with reduced costs, both in the lab and at the patient's home, to a great extent even step by step. Various assessments show phenomenal energy for the whiteness of body parts to survey Anemia. For example, Aggarwal et al. [6] inspected the authenticity of palmar whiteness for the finding of Anemia among kids developed 659 months. Tsumura et al. [7] considered skin concealing and surface assessment/mixture by eliminating Hb and melanin information in the skin. In addition, [8] reports focuses on the association among skin and Hb. Spinelli et al. [9] took a gander at the assessment of palmar and conjunctival whiteness to recognize Anemia: they found that there was a more conspicuous level of affectability to conjunctival pallor than to palmar whiteness. Various examinations found connections between's clinical signs, for instance, pallor to Anemia; in [10],

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MATERIAL AND METHODS

As we probably are aware, we are living in the period of 3D clinical science where we have bunches of Tools which can distinguish the infection. In present period we have bunches of innovation yet there is absence of clinical devices which can discover paleness with any intrusive cycle. At present we need to take the blood tests and through that we can discover the paleness. At present there is heaps of exploration who are dealing with Non obtrusive cycle where they are utilizing the

idea of picture preparing. Here they are utilizing the methodologies like eye side or nails. So according to the momentum search there is loads of examination holes are there which is truly should be fathomed and those are followings:

- **Lack of Real Time:** All current methodology are require pre characterize pictures of eye side or nails, so for that approach we need to catch great quality picture through eye side scanner or top of the line camera.
- **Accuracy:** All current methodologies can't make appropriate outcome as they are center around one single methodology like SPO2 based, EYE side dependent on nails based so there is any cross check technique is accessible which give guarantee of weakness.
- **Long Process:** according to scanner approach all past existing devices are require aches time
- **Time Issue:** All current calculation rush to give appropriate outcome as expected.
- **Quality Issue:** This is a major peril which is truly should be settled there is no any methodology which can get qulity level report from the information boundaries.

In this segment we talk about the fundamental Anemia assessment measure, what sort of essential calculation was utilized and what are the development research is there. Here we did the total near investigation and usage of those methodologies. These are the previous approach which are working in this area and we did the comparative analysis with these approaches.

a. Eye Side Based [38]
b. Nails Based [41]
c. Spo2 based [42]
d. Color Analysis [43]

Giovanni[38]: He author propose a non- invasive way to deal with Hb estimation.

Trupti [41]: In this work creator manages in such situation to take choice in malady finding. The contribution to the proposed framework is individual nail picture.

Komal [42]: In this work author create a system which is able to detect the blood oxidation level Using SPO2.

Srinivasan [43]: In this work author create a system which will take the photograph of the thumb with blood & based on color classification analysis the anemia.

As we know present era there is need of fast processing system so this is our proposed approach for the anemia detection: In this approach we use the Raspberry Pi Zero with 5M pixel 1080P camera, using that we take the real time image of the user nail and based on that image we apply the color classification and image classification approach to detect the anemia level, here we use the deep learning & machine learning approach so for that we train our system with existing image data base

and based on that our system is able to give the more accurate result.

Steps followed in proposed approach:
1. **Real Time HD quality image capture**
1. **Image RGB Analysis**
1. **Image Pre–Analysis**
1. **Image Classification**
1. **Color Classification**
1. **Comparison with Train Data Set**
1. **Color Analysis**
1. **Result**

Table 4.1 Comparative Analysis

Process	Cost	Device	% Accuracy	Time
Giovanni Below	Average	Image	High	Less
Trupti	Low	Image	High	Very Less
Komal	High	SPO2	Average	High
Srinivasan	Average	Image	Low	Normal
Proposed	Average	Image	Very High	Low

Figure 3.1: Open Device

Figure 3.2: Device Design

RESULT AND DISCUSSION

In this section we introduce the relative investigation of all with past existing methodology. As we can see table. 5.1 shows the comparative analysis based on the some of the parameters which are followings:

1. Cost Complexity
1. Device
1. Error Level (% Accuracy)
1. Time

Here table 4.1 shows the shows the comparative analysis of time, cost, accuracy and device requirement based on the comparative we can say Proposed approach is batter in terms of all parameters as it requires less time and high accuracy is average cost the cost of system, As per comparative analysis our proposed approach is far batter than the existing approach.

CONCLUSION

2020 is known for COVID-19 as we know due to COVID-19 lots of medical issue are created. Anemia is very risky for COVID-19 the person who have anemia they have high chance to get the affected by the COVID-19, so as we know to detect Anemia it's a difficult process, user have to go to the lab and then only they will get the result which is very danger in this work we proposed a portable device which is able to detect the anemia. Here we also did the comparative analysis and based on the analysis we found our proposed approach is better than the all previous existing approach.

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Advanced Chatbot Using Nlp, Clustering, Predictive And Reinforcement Learning

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ABSTRACT

Chatbot's have become the most common customer support tool in all the E-commerce organizations. The use of a Chatbot for addressing customer concerns helps the organization to reduce the load on the human staff and could filter out simple queries that would put a strain on the staff. This would enable the support staff to focus on complicated queries. An AI system that can address all the queries of the customer automatically would be a boon for all the organizations. This would save precious time, money and avoid human errors that occur due misunderstandings. The proposed algorithm tries to create an Artificial Intelligence system which extensively uses Natural Language Processing and Predictive Analysis. Natural Language processing would try to decipher the queries posed by customers and interpret it to the System which would then try to collect the response from the knowledge base while predictive analysis would try to predict the next query to be posed by the customer and would keep the requisite responses handy from the Knowledge base. Learning is an essential feature of this algorithm as we are trying to create an intelligent Chatbot. We use clustering to group new information with knowledge. To reduce timing during clustering we use 2-stage clustering process. We use reinforcement learning using user feedback as reward to improve the efficiency and accuracy of the Chatbot. The use of these algorithms aids in improving its overall performance.

KEY WORDS: CHATBOT,CLUSTERING,LEARNING,MACHINE LEARNING, NLP, PREDICTIVE ANALYSIS, REINFORCEMENT LEARNING.

INTRODUCTION

Chatbot's are being extensively used across all websites, may it be banking or an e-commerce website [5]. The use of Chatbot's provides a support mechanism for the organization to address any user queries almost instantaneously. However, majority of the present day Chatbot's are configured or are programmed for addressing very limited set of queries and certain unique queries remain out of bounds. A Chatbot that can self-learn would be a boon to the organizations as it would be a boon to effectively serve the clients and customers. Chatbot's using Artificial Intelligence and Machine Learning technology can address lot of limitations faced by the traditional chatbot [13].

The proposed system would use NLP and Predictive analysis to interpret the customer query and also to predict any possible reactions to the generated responses. The system would be following a self-learning model which would further increase the intelligence and efficiency of the Chatbot and make it more effective with time.

Need For Self-Learning Chatbots: As discussed in the earlier section, self-learning would induce intelligence in the Chatbot's so that it would require very less human intervention. The Chatbot with its learning intelligence will be able to help the customers in resolving all their queries at the earliest with least human intervention. This can reduce simple human errors as well as save the organization a lot of time and money. The resources can be diverted to develop the proposed system and improve its efficiency and accuracy. This brings us to a critical question on the errors possible by human beings. The most common error in addressing customer queries is due to the inability to understand the query at the first place. This may be due to lack of understanding or linguistic barriers. Customer service stations provide multi-lingual support to address issues of linguistic barriers. However, Understanding is a psychological trait that varies from person to person and depends on various factors. However, in machines we can keep this ability consistent and with time we can fine tune and nurture this ability by repeatedly training it and subjecting it to a variety of situations. This is known as enriching the knowledge base.

The Proposed Algorithm: The proposed algorithm would be extensively using NLP[1] to analyze and understand the customer query and generate appropriate responses by fetching the same from the knowledge base. It would also be using predictive analysis techniques to predict the probable reactions from the customer on the generated responses. Further it would use appropriate ensemble algorithms to self-learn and continuously upgrade and enhance its knowledge base to improve the efficiency and accuracy of generated responses. The algorithm would work in parts as discussed below.

Stage 1: Analyzing The Input: The first task of the algorithm is to understand the input. The proposed system takes in the input from the customer in the form of a natural sentence. E.g. "What is the status of my complaint?". Now it analyses the input using NLP Algorithms. This helps the system to understand the query and based on this it checks its knowledge base if the subject of the query is relevant. The NLP algorithms use semantic, syntactic, and lexical analysis to determine the context[2]. In case the subject is relevant, it passes on to the second stage of the algorithm. In case the subject is irrelevant then it would return an exception to the user, E.g. "Irrelevant Subject" and then wait for another input.

Figure 1: Stage 1: Analyzing The Input
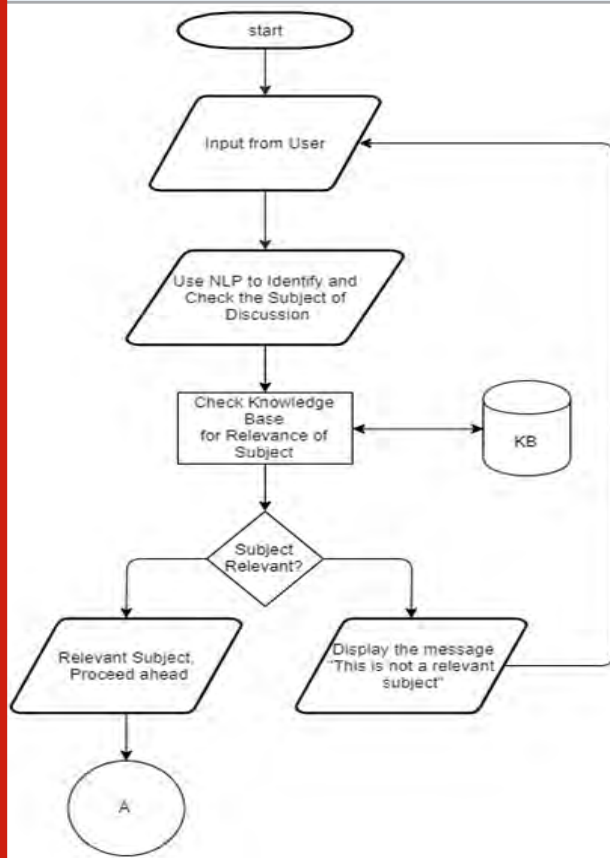
Stage 2: Advanced Analysis Using Nlp And Prediction Of Customer Reactions: Once the context of communication is confirmed, once more NLP algorithms are run to understand the query in detail. A Neural Network based architecture with learning can be used to successfully achieve this [3]. Once it is understood the Knowledge base[4] is accessed, in case it's the first response, or cache is accessed in case it's a continuing conversation to get the most appropriate response for the query at the earliest. In case the response is not available, the Chatbot stores the query for learning. Simultaneously, the system shall predict all possible queries by the user with respect to the context of communication and accesses the database for all predicted responses of the user for the generated responses. The chatbot would cache responses for all level 1 predicted responses to improve its effectiveness. Learning process is initiated in the background to analyze and store the most appropriate responses for any query that could not be addressed. Once a response is completed, the Chatbot enters its initial state awaiting Input from the user.

Stage 3: Learning Process: The highlight of the proposed Chatbot is its ability to self-learn. The knowledge it gains is learnt automatically and is clustered with the existing knowledge to improve it efficiency and accuracy. In case the input or query it receives is new and unique and

is understood and known to be associated with some knowledge then it is clustered with the most closely associated knowledge that is available in the Knowledge Base.The Learning Process involves understanding the user input using NLP. In the absence of a known response, it performs analytics on the knowledge base to select a suitable response. In a situation wherein the knowledge cannot be determined or self-learned, the system flags it for the Knowledge engineer to manually address the queries. For this learning process, the system would use Associative and Reinforcement Learning process. The system tries to discover interesting relationships between existing knowledge and data, previous responses and associates them to create useful knowledge. The data that the Chatbot may also use to learn is through crawling throughout the internet for useful information confined to its boundaries.

Components of the Algorithm: The proposed Chatbot algorithm uses a variety of basic algorithms such as Natural Language Processing, Reinforcement Learning, and clustering. These fundamental AI algorithms become the building blocks of our proposed algorithm. At each stage of our algorithm, one or more of these basic algorithms contributes to the functioning of the proposed system.

Natural Language Processing: The goal of Natural language processing is to read a given input, decipher and understand it to generate the desired output. NLP is a branch of artificial intelligence which deals with human computer interaction. Being a Chatbot, it is designed to interact with humans and address their queries. Therefore, it is necessary that the Chatbot understand the queries posed by humans and such queries be rightfully interpreted by the Chatbot to generate the desired response. The human language is bound by lot of factors such as syntax, semantics, and grammar. Humans are bound to make mistakes, therefore the Chatbot must be trained to interpret and understand such requests. Due to this NLP is considered as a very difficult problem in computer sciences altogether. This is because, the nature of human language is what makes it extremely difficult. To understand a human language, one needs to understand the words and the interconnections between them in a sentence which makes it a huge challenge for AI systems. While humans can easily master languages imbibing these characteristics in an AI system becomes extremely challenging and the system may have to undergo huge amount of training.

Clustering Algorithm: Clustering algorithms analyze the data and then cluster or group them with similar data based on certain degree of similarity. The data in our proposed system would be text based data. Therefore, ascertaining similarity would again require use of natural language processing. Clustering of data would

create multiple responses for the same query however this would help us in refining our responses by fine tuning which would be possible using Reinforcement learning. The most famous clustering algorithm is K means clustering algorithm which places the data in K clusters. The execution time of K-Means clustering increases with increase in the size of dataset. If the data being generated is huge, it is considered as a Data Stream and we can use MOC-Stream based on Multi-objective clustering [6]. The goal of MOC-Stream is to find clusters by applying several algorithms corresponding to several objective functions. Knowledge base data sets have the tendency to keep on growing in size and complexity. We can therefore also use 2-stage clustering method [8] as it can be used to improve efficiency of the algorithm. By clustering we will be able to have multiple responses for a single query which would help us in determining the best response subject to the query being posed under any situation.

Figure 2: Stage 2: Advanced Analysis Using Nlp And Prediction Of Customer Reactions
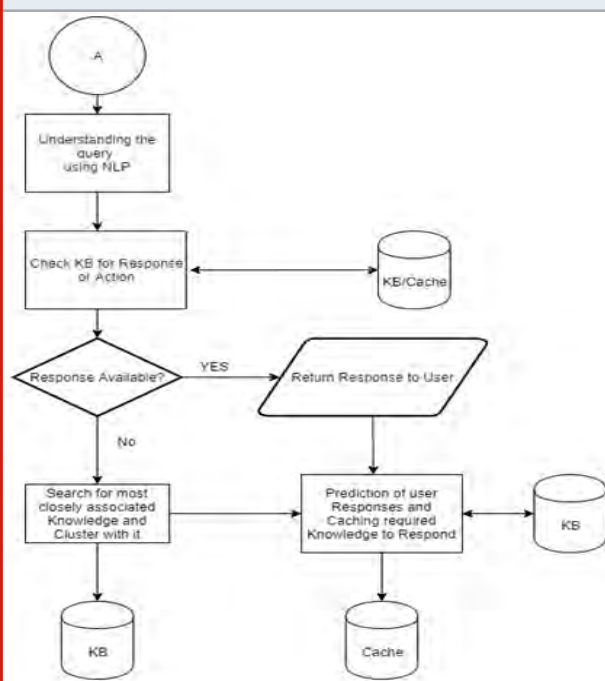
Reinforcement Learning: Reinforcement learning is a machine learning technique wherein we try to maximize the reward in a particular situation [12]. In case of our proposed system, this maybe generating the most suitable and acceptable response for a posted query. The reward can be calculated by asking users to rate the response they received by a simple rating system. These ratings can then be used to understand the reward for each response and improve reinforcement learning. This is not a one-time process but with consistent learning the system refines itself time and again to generate the best response. The system clusters multiple responses by associating them with the groups. Therefore, in our

proposed system, clustering and reinforcement is a continuous process.

Challenges to the Proposed System: The proposed algorithm uses Natural Language processing as its backbone. Therefore, whenever there are linguistic issues the algorithm has the highest probability of failure [7]. The input to the Chatbot must be in consistent language which can be interpreted by the system easily. Additional programming and training maybe required to make the chatbot communicate in multiple languages [11]. Any forms of slangs and abbreviations may not be easily deciphered by the algorithm. As this is a learning algorithm, learning consumes time and for the proposed Chatbot to be efficient it must continuously learn from various training datasets. Learning process is continuous and a part of the proposed Chatbot using this algorithm it is necessary to give the system time and enough data so that it can improve its accuracy and efficiency.

Figure 3: Stage 3: Learning Process
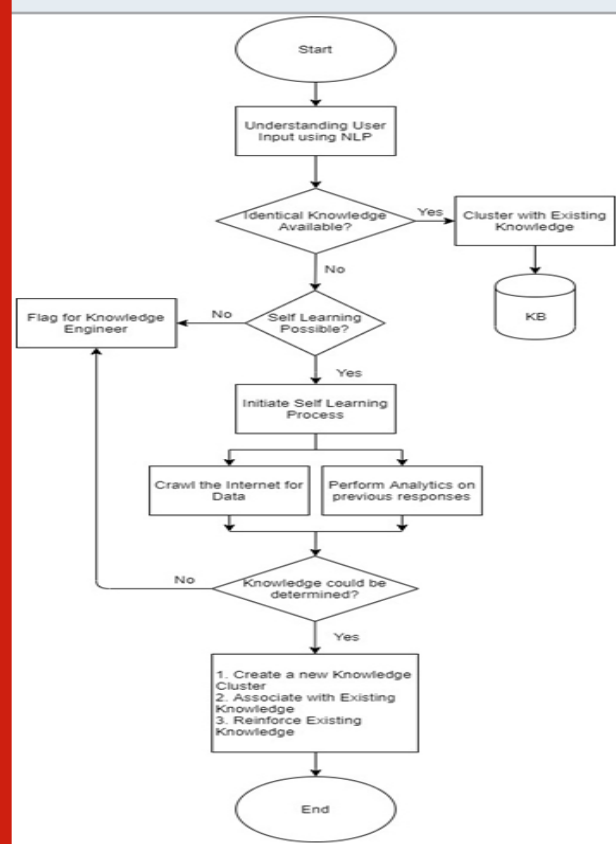
Advantages of the Proposed System: As discussed earlier, the system will create an interactive Chatbot that will reduce the work for humans who work in support centers to address queries. The Chatbot will also self-learn using AI algorithms requiring very less interventions from Knowledge Engineers. The Algorithm has been proposed such that it is not confined to any programming language or system and can be freely deployed across any platforms. The algorithm uses NLP and this helps it to understand human language very easily. This would reduce costs Human workload as well as any communication errors.

CONCLUSION

The developments in AI and Machine Learning technologies has opened new arenas in Information Technology. This has also made the task of humans easy. Chatbot's are used by many organizations on their websites and they get a range of queries as inputs from the users to seeking responses to their questions. However, Chatbot's are hardcoded and answer only limited set of questions. We can use Natural Language processing and AI Algorithms to imbibe the quality of learning in Chatbot's and utilize this potential to answer many more queries for the users. This when deployed, can ease the tasks of users and would make Human computer interaction far more easy and also would create a very encouraging environment for users to get their queries resolved very quickly and accurately by using a Chatbot. Our proposed algorithm uses natural language processing algorithms to understand the linguistic input. It then uses an efficient form of clustering algorithm and Reinforcement learning using user feedback which helps it to learn and accumulate knowledge to address queries posed to it in an effective manner. An added advantage to itself learning ability is its ability to crawl the web for useful information confined to its boundaries. By using Neural network technology, we can further improve the working of chatbot ad neural network helps in deep learning [9]. All these features culminate it into an effective, accurate and efficient self-learning chatbot.

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Comparative Study on Road lane detection On Image for Driverless Car

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ABSTRACT

As we know we are living in the era of robotic machines which are able to do lots of work. Similar in automobiles industry, many manufacturing company are try to develop a driverless car. Uber also tried in the area of driverless car to reduce their operation cost on drivers, apart from that many other companies like tesla also working on the same area. As per the driverless car road lane detection is the most basic and most important step without that approach there is no any possibility to build the driverless car system. In this paper we did the comparative analysis between the previous existing road lane detection system. For the comparison point of view we use the F score which will decide the which is better approach

KEY WORDS: DRIVERLESSROAD, LANE, ML, DL, CNN.

INTRODUCTION

Deep learning has been fundamental for late advances in various zones, particularly in self-ruling driving [2]. Numerous of the profound learning applications in self-driving vehicles are in their observation frameworks. To be sheltered around people, self-ruling vehicles ought to see their environmental factors, counting the situation of different vehicles and themselves. In the end, the more unsurprising a vehicle's development is, the more secure it will be for its travelers and people on foot. Accordingly, it is significant for independent vehicles to realize every path's precise position, which is the objective of path discovery frameworks. Path discovery models need to conquer different difficulties. A model that will be utilized in a genuine situation ought to be strong to a few unfriendly conditions, for example, outrageous light and climate conditions. Besides, path markings can be blocked by different items (e.g., vehicles), which is amazingly regular for self-driving vehicles. A few methodologies, for example, polynomial relapse models, may likewise experience the ill effects of an information unevenness issue brought about by the long-tail impact since cases with more keen bends are more uncommon. Additionally, the model must be hearty as well as effective.

In a few applications, path identification must act progressively, or quicker to spare handling power for different frameworks, a necessity that numerous models battle to adapt to. There are various works in the writing that tackle this issue. Prior to the coming of profound learning, a few strategies utilized more customary PC vision procedures, such as Hough lines [4, 1]. All the more as of late, center has moved to profound learning approaches with the development of convolutional neural organizations (CNNs) [17, 11, 18]. In this specific situation, the path recognition issue is generally detailed as a division task, where, given an information picture, the yield is a division map with per-pixel forecasts [17]. Albeit later progresses in profound learning have empowered

the utilization of division networks continuously [22], different models battle to accomplish ongoing execution. Therefore, the quantity of spine choices for division based strategies is somewhat restricted. Subsequently, some ongoing works have proposed arrangements in different ways [13, 23]. Aside from that, numerous other issues are normal in chips away at path recognition, for example, the requirement for a post-handling step (normally a heuristic), long preparing times, and an absence of freely accessible source code, which upsets correlations and reproducibility.

Image processing is one of the principle drivers of mechanization, security and well being related utilization of the electronic business. Most picture preparing advances include a few stages like treat the picture as a two-dimensional flag and apply standard sign handling procedures to it. Pictures are additionally dealt with as 3D signals where the third measurement is the time or the z-pivot. Exceptionally proficient, low memory and solid arrangements can be accomplished by using Embedded Systems and Image handling to draw out the advantages of both for applications. Google is one of the billion dollar organizations who has shown its own driverless vehicle, a structure that gets rid of every single traditional control including the guiding wheel, and other amazing innovations. In their driverless vehicle, Google has included Image Processing, yet in addition numerous other stunning advancements and one of the most significant among them is Lidar, which means "Light Detection and Ranging". It comprises of a cone or puck-formed gadget that ventures lasers which skip off items to make a high-goals guide of nature continuously.

Notwithstanding assisting driverless vehicles with seeing", "Lidar is utilized to make quick, exact 3D outputs of scenes, structures, social legacy locales and foliage. A portion of different advances incorporate Bumper Mounted Radar for crash evasion, Aerial that peruses exact geo-area, Ultrasonic sensors on back wheels which recognizes and evades snags, programming which is modified to decipher basic street signs and so forth. Aside from these, there are altimeters, whirligigs, and tachymeters that decide the exact situation of the vehicle and offers exceptionally precise information for the vehicle to work securely. The synergistic joining of sensors is one of the most significant factors in this self-ruling vehicle which incorporates the information assembled out and out by these sensors are ordered and deciphered by the vehicle's CPU or in manufactured programming framework to make a protected driving encounter.

Aside from Google, numerous different organizations like Tesla, Audi, Uber have additionally built up their own driverless vehicles and have tried conceivably. Picture handling is one of the standard drivers of automation,

security and prosperity related usage of the electronic business. Most picture planning progresses incorporate a couple of stages like treat the image as a two-dimensional banner and apply standard sign taking care of systems to it. Pictures are also managed as 3D signals where the third estimation is the time or the z-rotate.

Astoundingly capable, low memory and strong plans can be cultivated by utilizing Embedded Systems and Image taking care of to draw out the benefits of both for applications. Google is one of the billion dollar associations who has indicated its own driverless vehicle, a structure that disposes of each and every conventional control including the controlling wheel, and other stunning advancements. In their driverless vehicle, Google has included Image Processing, yet likewise various other dazzling progressions and one of the most critical among them is Lidar, which signifies "Light Detection and Ranging". It contains a cone or puck-framed contraption that adventures lasers which skirt off things to make a significant standards guide of nature persistently. Despite helping driverless vehicles with seeing", "Lidar is used to make fast, definite 3D yields of scenes, structures, social heritage regions and foliage.

A segment of various advances join Bumper Mounted Radar for crash avoidance, Aerial that scrutinizes careful geo-zone, Ultrasonic sensors on back wheels which perceives and dodges obstacles, programming which is changed to unravel fundamental road signs, etc. Beside these, there are altimeters, whirligigs, and tachymeters that choose the specific circumstance of the vehicle and offers particularly exact data for the vehicle to work safely. The synergistic joining of sensors is one of the main factors in this self-administering vehicle which fuses the data amassed far and away by these sensors are requested and translated by the vehicle's CPU or in produced programming system to make a secured driving experience. Beside Google, various associations like Tesla, Audi, Uber have also developed their own driverless vehicles and have attempted possibly.Vital writing overview related past research on leaf deficiency identification are given in II recognition based past work are given in segment ii though area III portrays explore issue and future degree philosophy and IMPLEMENTATION FOR THE PREVIOUS EXISTING APPROACHES. IV portrays philosophy and IMPLEMENTATION FOR THE PREVIOUS EXISTING APPROACHES. Trial results and its examination are given in area V. At long last, area VI closes the paper.

Litrecture Review: Various vehicles today starting at now contain a couple of parts of a free vehicle. For example, as a driver pushes toward their vehicle with a key, a distant chip may make the gateways open normally. As the driver shifts into switch, sensors mounted in the

front and back corners of the vehicle accumulate data by methods for cameras and radar. That data, close by speed and other working data, is accumulated by a processor in the vehicle. Programming computations that understand the association among speed and partition stall the data and alert the driver or apply the brakes if a block in the vehicle's manner addresses an effect danger. As the driver takes not far-removed, the vehicle's camera, radar, LIDAR and various sensors continue watching nature. These developments send data back to the vehicle's processor to make a 3D picture for assessment, and to impel any exercises that the item figuring may regard indispensable. In a totally autonomous vehicle, planning programming would in like manner help recognize when a vehicle should change orientation.

Starting at now, there is no standard stage for these progressions accordingly, for example, one automaker may choose to join various cameras while another might choose to use a single camera anyway more radar sensors. While unprecedented advances have been made over the span of ongoing years in the improvement of self-overseeing driving, totally self-administering vehicles actually can't be introduced for a colossal extension. Figure 2 highlights extending Levels of driver motorization as described by the US Transportation Security Administration (TSA). Until this point as expected, most by far have recently experienced Levels 0-2. Nevertheless, Uber starting late began working Level 3 self-driving vehicles, which consolidate drivers anyway work in self-driving mode in a foreordained number of US metropolitan networks. At that point, in late 2016, Baidu ran a starter working Level 3 self-overseeing vehicles from three Chinese automakers passing on voyagers inside a two-mile area. Level 3 was furthermore successfully appeared in a continuous authentic test drive by Uber's self-driving truck association, Otto, in the US. The association teamed up with ale brewer AB InBev to pull precisely 52,000 containers of ale across 120 miles of expressway using a self-driving truck in which the human explorer just examined oneself driving system from the back resting billet.

In spite of the fact that the principal path location approaches depend on old style PC vision, considerable advancement on precision and effectiveness has been accomplished with late profound learning strategies. Subsequently, this writing audit centers around profound path locators. This part initially talks about the predominant methodologies, which depend on division [17, 11, 29, 15] or rowwise grouping [10, 20, 27], and, accordingly, audit arrangements in different ways. At long last, the absence of reproducibility (a typical issue in path identification works) is examined. Division based techniques. In this methodology, expectations are made on a for every pixel premise, arranging every pixel as either path or foundation. With the division map created,

a post-handling step is important to decipher it into a bunch of paths. In SCNN [17], the creators propose a plan explicitly intended for long slender structures and show its viability in path identification. In any case, the strategy is slow (7.5 FPS), which obstructs its materialness in genuine world cases. Since bigger spines are one of the primary guilty parties for more slow speeds, the creators, in [11], proposes a self consideration refining (SAD) module to total relevant data. The module permits the utilization of a more lightweight spine, accomplishing a superior while keeping up continuous productivity. In CurveLanes-NAS [26], the creators propose the utilization of neural engineering search (NAS) to discover a superior spine. Despite the fact that they accomplished best in class results, their NAS is incredibly costly computationally, requiring 5,000 GPU hours for each dataset. Line savvy order strategies.

The column savvy arrangement approach is a straight forward method to identify paths dependent on a network division of the information picture. For each line, the model predicts the most likely cell to contain a piece of a path checking. Since just a single cell is chosen on each line, this cycle is rehashed for every conceivable path in a picture. Comparable to division strategies, it likewise requires a post-handling step to build the arrangement of paths. The technique was first presented in E2E-LMD [27], accomplishing cutting edge results on two datasets. In [20], the creators show that it is fit of arriving at rapid, albeit some exactness is lost. This approach is likewise utilized in IntRA-KD [10]. Different methodologies. In FastDraw [18], the creator proposes a novel learning-based way to deal with translate the path structures, which evades the requirement for bunching post-handling steps (needed in division and line insightful characterization strategies). In spite of the fact that the proposed technique is appeared to accomplish high speeds, it doesn't perform in a way that is better than existing best in class strategies regarding exactness. The equivalent impact is appeared in PolyLaneNet [23], where a significantly quicker model, in view of profound polynomial relapse, is proposed. In that approach, the model figures out how to yield a polynomial for every path.

Notwithstanding its speed, the model battles with the imbalanced nature of path recognition datasets, as confirmed by the high predisposition towards straight paths in its forecasts. In Line-CNN [13], an anchor-based technique for path identification is introduced. This model accomplishes best in class results on a public dataset and promising outcomes on another that is not openly accessible. Regardless of the constant productivity, the model is impressively more slow than different methodologies. In addition, the code isn't public, which makes the outcomes troublesome to repeat. There are additionally works tending to different parts

of the pipeline of a path finder. In [12], a post-handling technique with an emphasis on impediment cases is proposed, accomplishing results extensively higher than different works, yet at the cost of prominently low speeds (around 4 FPS). Reproducibility.

As noted in [23], a considerable lot of the refered to works don't distribute the code to recreate the outcomes announced [13, 18, 27], or, now and again, the code is as it were somewhat open [11, 10]. This blocks further subjective what's more, quantitative examinations. For example, the two most regular measurements to quantify a model's effectiveness are increase gather activities (MACs) and casings per-second (FPS). While the first doesn't rely upon the benchmark stage, it isn't generally a decent intermediary for the second, which is the genuine objective. Thusly, FPS correlations are additionally thwarted by the absence of source code. [28] Hang address the bend path recognition issue which presents more practical difficulties than traditional path identification for better encouraging current helped/self-ruling driving frameworks.

Current handdesigned path location techniques are not strong enough to catch the bend paths particularly the distant parts because of the absence of demonstrating both long-range logical data and itemized bend direction. In this paper, we propose a novel path touchy design search structure named CurveLane-NAS to naturally catch both since quite a while ago went lucid and precise short-range bend data.[29] Lucas propose LaneATT: an anchor-based profound path discovery model, which, much the same as other conventional profound item indicators, utilizes the secures for the component pooling step. Since paths follow a customary example and are exceptionally associated, we guess that at times worldwide data might be urgent to deduce their positions, particularly in conditions, for example, impediment, missing path markers, and others. Subsequently, this work proposes a novel anchor-based consideration system that totals worldwide data. The model was assessed widely on three of the most. [30] Yeongminpropose a traffic line recognition strategy called Point Instance Network (PINet); the strategy depends on the key focuses assessment and example division approach.

The PINet incorporates a few stacked hourglass networks that are prepared all the while. In this way the size of the prepared models can be picked by the figuring intensity of the objective climate. [31] Xingang propose Spatial CNN (SCNN), which sums up customary profound layer-by-layer convolutions to cut byslice convolutions inside component maps, hence empowering message passings between pixels across lines and sections in a layer. Such SCNN is specific reasonable for long ceaseless shape structure or enormous articles, with solid spatial relationship yet less appearance signs, for

example, roadways, posts, and divider. We apply SCNN on a recently delivered exceptionally testing roadway location dataset and Cityscapse dataset1. The outcomes show that SCNN could get familiar with the spatial relationship for structure yield and altogether improves the exhibition. We show that SCNN beats the intermittent neural organization (RNN) based ReNet and MRF+CNN (MRFNet). SO these are the previous approach which are work on road lane detection.

Research Issue: In this section basically we talk about research gap which need to be solved,present research there is lots of issues are there which followings are:

1. Time complexity: In existing solution time complexity is main challenge
2. False Detection: Most of the algorithms are not capable to track the exact lane of the road.
3. Low Accuracy: Most of the approach are not good in terms of accuracy level. system
4. Time & Quality management issue: There is no any approach which is able to make justice with both parameters.
5. Accuracy: There is lack of accuracy in most of the previous existing approach

As per the previous research there is lots of research gap which need to be solved in near future

Methadology & Implementaion: In this section we talk about the basic leaf fault detection process, what kind of basic algorithm was used and what are the advance research is there. Here we did the complete comparative study and implementation of those approaches.

Hang[28]: According to this approach author followings steps:
1. a feature fusion search module
2. an elastic backbone search module to explore an efficient feature extractor with good semantics and latency
3. an adaptive point blending module

Figure 4.1: Proposed Approach By Hang [28]
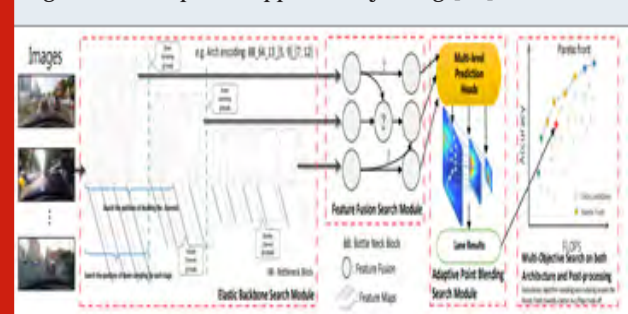
Lucas[29]Lane ATT: According to this approach author followings steps:

1. Lane and anchor representation
2. Backbone
3. Anchor-based feature pooling
4. Attention mechanism
5. Proposal prediction
6. Non-maximum Supression (NMS
7. Model training
8. Anchor filtering for speed efficiency

Figure 4.2: Proposed Approach By Lucas [29]
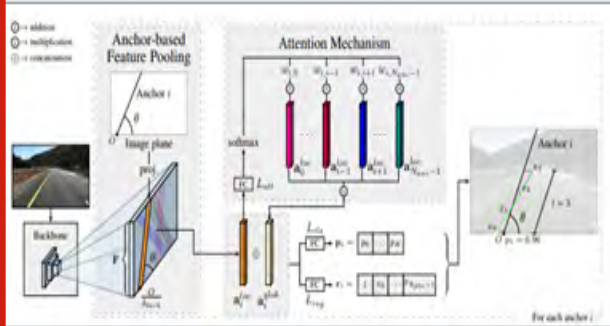
Yeongmin[30] PNET: According to this approach author followings steps:

1. Input Image
2. Resizing Network
3. Predictive Network
4. Three yield branches are applied at the finishes of every hourglass block; they anticipate certainty, counterbalance, and inserting highlight. The misfortune capacity can be determined from the yields of every hourglass block. By cutting a few hourglass modules, required figuring assets can be changed.

Figure 4.3: Proposed Approach By Yeongmin[30]
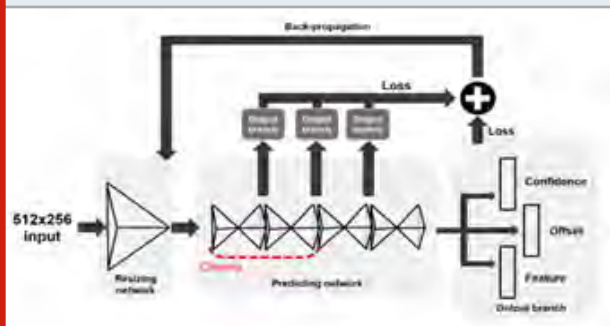
Xingang[31] SCNN: According to this approach author followings steps:

1. Input
2. CNN
3. Top Hidden Layer
4. SCNN_D
5. SCNN_R
6. SCNN_L

Figure 4.4: Proposed Approach By Xingang [31]
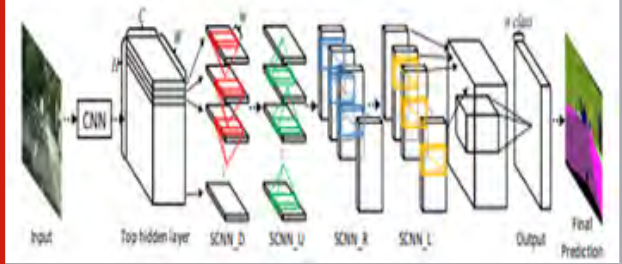
RESULTS AND DISCUSSION

In this section we introduce the relative investigation of all with past existing methodology. As per the driver less car these are the main feature which should be there, Here we use F Score as a parameter through that we got the comparative analysis.

F Score: In factual examination of twofold arrangement, the F-score or F-measure is a proportion of a test's precision. It is determined from the exactness and review of the test, where the accuracy is the quantity of effectively recognized positive outcomes separated by the quantity of every certain outcome, including those not distinguished accurately, and the review is the quantity of accurately distinguished positive outcomes partitioned by the quantity of all examples that ought to have been distinguished as sure.

$$F_1 = 2 \cdot \frac{\text{precision} \cdot \text{recall}}{\text{precision} + \text{recall}} = \frac{\text{TP}}{\text{TP} + \frac{1}{2}(\text{FP} + \text{FN})}$$

TP = number of true positives
FP = number of false positives
FN = number of false negatives

Figure 5.1: Comparative F score-based analysis
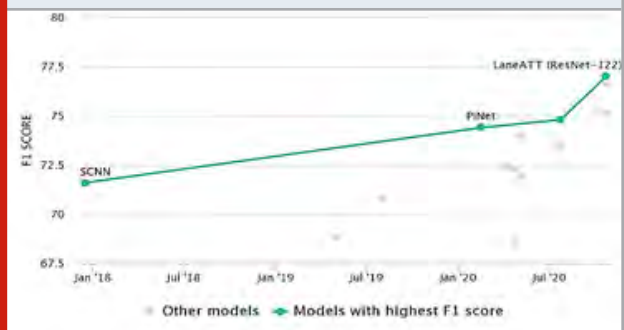
Here SCNN means [31], Pnet means [30], Lane Att means [29] and another one is [28]

CONCLUSION

As we know driver-based car have lots of real time

challenges as per the user point of view, Now a days most of the many companies are focusing in the driverless car system as they want to give the great experience to there customer. Road lane detection is the main and basic step for the driverless car system, In this paper we did the comparative analysis between the existing approach and by using of F score we find that Lucas [29] is good approach in terms of the all new existing approaches.

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Covid19 Impressions: Health Aspects of New Educational Model – Stakeholders Perspective

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ABSTRACT

To limit the spread of covid-19, it is recommended that all the gathering intensive activities have closed and all the citizens are recommended to self-isolate. In the lieu of above mentioned recommendation, all the working units of education sector like schools, institutes, coaching centers etc. have been closed around the globe for indefinite period. To avoid educational impact of this pandemic government has decided to continue online studies through various available online modes like zoom, Google Classroom, Apple Clips, Quizlet and Microsoft Teams etc. This model has certain new aspects which were not there in traditional education scheme. The main objective of this paper is to discover various aspects of this educational model. What is perception of various stakeholders about these new teaching modes? What is the impact on the health of stakeholders' when they are following this educational pedagogy? How stakeholders are responding to new activities that are part of this new teaching medium? This research piece is analyzing these aspects. To attain the objective in mind, a questionnaire was prepared and sends to various users of this model. Their responses were collected, filtered, analyzed [using SPSS version-20] and presented for discussion. The analysis will help us find the problematic areas that can be work upon to make it perfect and reliable education model. As a result, it can be used not only as substitution model but can be widely accepted as a powerful tool for teaching online.

KEY WORDS: COVID-19 IMPACT ON EDUCATION, ONLINE EDUCATION, STUDENT, TEACHER, PARENTS, HEALTH IMPACT OF ONLINE TEACHING.

INTRODUCTION

Around third week of march 2020, UCG (University Grant Commission), has issued a notice to all the educational units to postpone the education, evaluation and examination activities due to spread novel "Corona" virus. The august body has given various guidelines to ensure smooth delivery of education keeping the safety of students, teaching, non-teaching and other concerned staff members [1]. The wide application of

"online Teaching" has been started from there only. Earlier few online platforms were available that were providing some online teaching through asynchronous mode like video, online platforms like Swayam, Coursera, NPTEL and many more [2]. During pandemic times, educational units have shifted their base from physical to virtual platform to conduct online classes. These online teaching tools are giving their support not just for classes but for other educational activities as well like; FDP (Faculty Development Programs), MDP (Management development Programs), seminars, Corporate sessions are also delivered through this medium [3].

Both government as well as non- government organizations are ready to provide financial support to invest in logistics, required for smooth conduct of online education [4]. Like government has recently launched PM e-Vidya platform that includes DTH channels to deliver educational contents to the students. The program covers 100 top

universities and schools and it's operational since May 30 2020 [5]. The launch date of platform indicates the relevance of this program, the huge pool of information which covers vast topics and subjects is ready within 70 days of official lockdown around the nation. The efforts made by various Governments and private organizations concerning online classes are really recommendable but contrary to the expectations this medium has highlighted few forefronts of Indian society. While delivering online classes the resources, mediums and applications used by educational institution has divided the elite and average schools. This division also applied to the doles student of these institutions and benefits that can be withdrawn from this education medium.

Although government is trying to build up the roadmap to blur this demarcation and making an efforts in the area where all students should be equally benefitted with this digital practice. During Covid-19 time, the prime objective concerning educations was "Suspending Classes without Stopping Learning" has been adopted by various Governments without thinking much about medium, environment, implications of educational equality, understanding aspects of students, aftermaths on health, need of efforts and infrastructure by educators [6] [7]. There are possibilities that due of overlook of various important aspects, lack of proper training & guidelines, privation of resources and inapt environment the expected outcomes could not be achieved.

Current research articles and web forums are discussing a lot about this education medium and various issues that stakeholders of this medium are facing [8] [9]. Although the repost published by Ministry of HRD has given details view on initiatives taken by government to facilitate online education all across the country even in remote areas [10]. On the contrary as per survey conducted by MSCERT (Maharashtra State Council of Education and Research) around 60% students have access to smart phone, 57% students have internet connectivity, and 30% are using Diksha app. Same survey has reported that 72.2% parents have reported that they are not able to access online classes and don't have digital access skills. It has been accepted in the report that 50% have confessed that they can accessed and benefitted with online reading material [11].

Problem Description and Objectives: Although all aspects related to the online educations necessitates discussion and analysis but the scope of the paper is limited to the health aspects of the same. Authors of this paper are trying to address the concerns of various stakeholders related to health issues popped due to online teaching & studies. The most popular method to address the concern is to first understand their perspective. The same has been done through questionnaire method of survey. The next few sections of this paper will illuminate flow of the research activities carried out for this work.

Objectives: Due to Covid-19, education has changed vividly, with the distinct rise of online learning, whereby teaching is undertaken remotely and on digital platforms.

Various studies suggest that online learning increases preservation of information, and takes a smaller amount of time to understand the things. There are challenges too. It is a potential danger of internet exposure to young kids. Few students without stable internet connectivity struggle to participate in online classes [11]. Not just students, teachers are also struggling to understand and use the technology. It is difficult for the educators to get comfortable with online teaching technology. The lack of real world interaction between students and teachers is yet another challenge. The objective of this research paper is to identify various factors which are affecting the health of stake holders. Although questionnaire has questions related to various parameters [Reference Figure 1], aspects related to heath are covered in this paper. some of the considered aspects are mentioned below:

1. Impact of Online classes on life style:
2. Impact of Online classes on eyes, headache and sleep cycle:
3. Impact on Physical Health: Muscle strength and body postures:
4. Impact on Mental Health: Anxiety, anger and depression:
5. Impact of less Travelling hours on health

Figure 1: Domains division in questionnaire

METHODOLOGY ADOPTED

Stakeholders Selection: The system has many stakeholders, some are directly associated with the system like; student, teacher and parent [in case of toddlers] and other have indirect association with the model like; Educational Institution and Country's economy [Reference Figure 2]. The authors have decided to send the questionnaire to the people that are directly associated with the system.

Figure 2: Stakeholders of Online Teaching

Survey Technique & Data Collection: A questionnaire has been prepared using "Google Forms" by keeping vision of the various stakeholders. Authors have tried to keep the questionnaire concise but comprehensive. It consists of 23 questions that belong to various domains (Reference: Figure 2). In order to collect diverse responses the first phase of questionnaire was distributed to around 250 users that are currently using this model directly. Although authors could manage to get only 175 responses after few mails and telephonic reminders. The responses were collected in Google excel sheet.

Data Cleaning and Dimension Reduction: Although excel itself is a very good analytical tool but authors have used SPSS version 20 for this analysis. For SPSS execution, fields are first coded into SPSS and data has been transferred. Some of the techniques of data cleaning have been adopted. Although, all the fields and responses are converted into SPSS, but the keeping the scope of the paper in mind, dimension reduction technique has been applied according to the scope of the paper. From the various domain [Reference figure1] questions related to health domain are analyzed in the research piece [Reference Table:1]. All the questions listed in the Table1 are Likert scale questions. They are ranked on the scale of 1 to 5, where 1 is the Least Important and 5 is Most Important. The have framed in such a manner to get respondents opinion about related question. Likert scale questions give you an idea about the degree, upto which respondent is agreed with questions and are very helpful in analysis.

Data Analysis & Representation: Before analyzing the respondents response let's look at the diversity of respondents. Figure 4 illustrates the percentage of various stakeholders that have given the responses about questions related to education system practiced in the time of covid pandemic.

Table 1. Questions related to Health domain and Respondents perspective		
Domain	Questions	% of respondents mark in the category of Important and Very Important
Health	Leads to sedentary life style	95%
	Harmful for eyes	75%
	Muscle strength and body postures/Pain	75%
	Links to anxiety, anger and depression	65%
	Physical and mental health	85%
	Impact on their sleep cycle	87%
	Lessen traveling hours upshot physical relaxation	73%

Figure 4: Various stakeholders that are respondents of the questionnaires

Figure 5 & 6: Involvement in Online Teaching before Lockdown
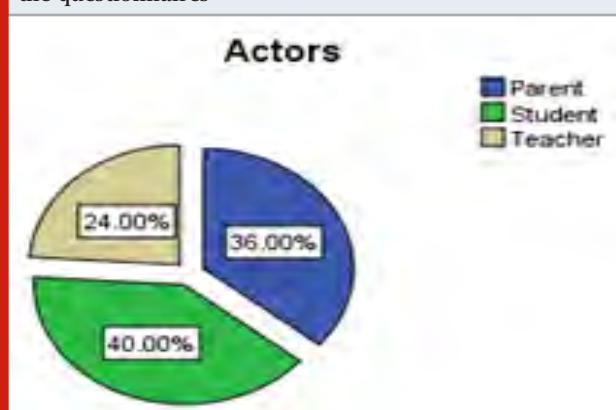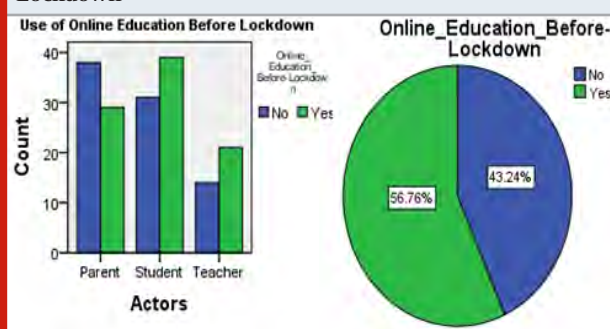
Among the respondents 40% are students and around same percentage of parents have given the responses. Although there are only 24% teachers which is a kind of limitation for the responses. Authors would like to overcome this limitation before the next phase of analysis. Afore any questions about health aspect concerning online education, authors would like to know how many respondents have used this kind of education system before the lockdown. It's is quite surprising to reveal the fact that in this digital era around 43% of the respondents have never experienced this kind of education model [Ref; Figure 5 &6]. Carefully examining the diagram indicates that among all the respondents,

most of the students said "yes" for using online education before and the least "yes" option can be noticed in the teachers' category.

While exploring the Figure 7 or Table 2, we can observe that our respondents belong to diverse fields, from school level to the higher education (both technical & non-technical). This gives us a kind of authentication that analysis retrieved through this work has considered perception of each group that is practicing online education in any manner.

Table 2. Respondents interaction with the Online education				
Respondent	Courses Frequency	Percent	Valid Percent	Cumulative Percent
College (non technical course)	2	1.1	1.1	1.1
College (technical Course)	54	30.9	30.9	32.0
College (technical Course), College (non technical course)	1	.6	.6	32.6
School (Class 1 to 5)	30	17.1	17.1	49.7
School (Class 1 to 5), College (technical Course)	8	4.6	4.6	54.3
School (Class 1 to 5), School (Class 6 to 12)	26	14.9	14.9	69.1
School (Class 1 to 5), School (Class 6 to 12), College (technical Course), College (non technical course)	2	1.1	1.1	70.3
School (Class 6 to 12)	44	25.1	25.1	95.4
School (Class 6 to 12), College (non technical course)	2	1.1	1.1	96.6
School (Class 6 to 12), College (technical Course)	6	3.4	3.4	100.0
Total	175	100.0	100.0	

Figure 7: Respondents Category for CEM interaction
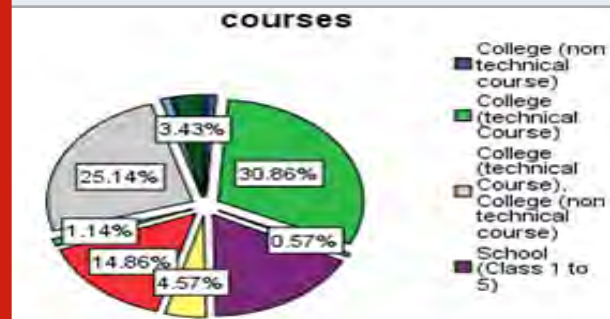
Figure 9 & 10 : Actors * Muscle strength & Body postures Actors* Anger & Depression
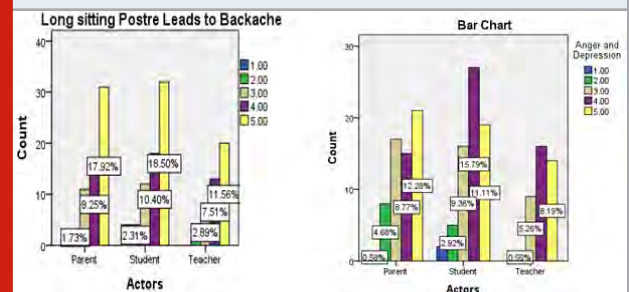
Figure 11: actors* Leads to sedentary lifestyle
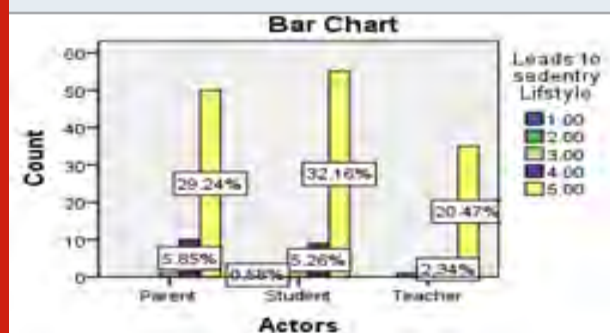
Figure 12
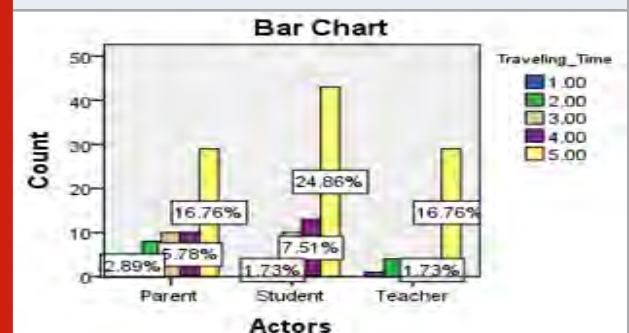
Another important aspect that is concerned in this regard is the health impact of these virtual classes on demonstrators and listeners. As people are spending more hours in front of electronic devices, it affects their vision which almost 75% of the respondents have ranked in the scale of 4 & 5[Reference Figure 8]. In the comments sections of the concerned questionnaire respondents have shared that long hours with system has caused dry

eyes syndrome, heavy eyes, frequent blinking and eye burning sensation. Most of these complaints have been noticed in the children age-group 8-10. Not just eyes they are facing issues with ears as well like: ear pain due to plugins, noise induced deafness and headache because of duration and intensity of sound.

Continuous sitting impacts their muscle strength and body postures [75% respondents marked it at the scale of 4 & 5]. Respondents have mentioned that they experience muscle fatigue, tingling sensations, tiredness, stress and performance degradation. Increased screen time, social isolation, lack of interaction and no physical activities leaves an adverse effect on their physical & mental health [it is very important or important for 85% respondents]. As lack of social interaction people are spending most of the time with digital devices: to entertain themselves, or complete their task or for preparation for the next meeting or class. Increased screen time has altered their sleep cycle and result in the change in the routine. This altered routine results in depression, anxiety, change in behavior and attention problem [Reference Figure 9 & 10]. Among the respondents teachers and Parents have categorically accepted this although most of the students have particularly not commented in regard. This could be understood as, students couldn't noticed this change in their behavior but parents and teachers have noticed this.

In order to maintain the social distancing norm all essential activities are executed in a virtual mode and it leads to the sedentary lifestyle. We can define a sedentary life style if our energy expenditure is < 1.5 metabolic equivalents. Due to online classes, we are sitting or lying in our respective places for a longer time for studies or concerned activities. Although all the respondents have accepted this (Reference Figure 11) but this % is more among students. As parents and teachers are still active due their own respective jobs but students main movement is for school/educational institution or leisure activities, but both are restricted.

The more concerning fact our survey reveals is that, this sedentary lifestyle is the cause of other health concerns like muscle & body strength. 75% of our respondents have marked this notion in the category of strongly supported or supported [Reference Figure 9]. As every stakeholder (Being Listener or Demonstrators) has to spend Long sitting hours with devices and no physical movements leads to more mental tiredness and less physical fatigue, which influence their sleep cycle. People are not getting enough and sound sleep. Impact on sleep cycle effects their mental and physical health [which around 85% respondents agreed] and leads to anger, anxiety and depression [which around 65% respondents agreed, Reference Figure 10].

Along with some negative impact, one aspect in which online educational pedagogy is leaving a positive impact is "reduce travelling hours". Lot of people have to travel for 3-4 hours in a day from work place to residential place, which is now almost NIL due to lockdown but still they can continue their work or concerned activities. It's kind of healing period/process for health concerns that are raised due long traveling hours. Long traveling hours just not leave a mark on your health but also impacts your productivity rate. It has been observed from the respondents comments that there productivity has gone up when there traveling time has gone down.

CONCLUSION & FUTURE SCOPE

From the respondents opinion and authors own evaluation & experiences, we can infer that although online education is working as a bridge and continuing the education at its normal pace even in this social distancing time when students and teachers apart at their respective places. But there are certain aspects that need to be addressed before this teaching pedagogy can be adopted as normal practice not as a substitute. Authors have already started to work on these lines where these perturbing aspects can be fixed with an ease. Authors are in process to develop TAM (Technology Adoption Model) that will offer a comfortable solution with existing restrictions.

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Cultural and Social Factors and Women Entrepreneurs Business Performance In Rajasthan

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ABSTRACT

This research examines the association of cultural and social factors with performance factors. The focus of this research is to identify the cultural and social variables of women entrepreneurs in Rajasthan and to explore the performance of women entrepreneurs business. A descriptive research design was used for this research. Data were gathered from 350 women entrepreneurs by simple random sampling; using self-administered questionnaire. Descriptive statistics and chi square were used for data analysis. Findings indicated that association found of religious belief and gender discrimination with performance factors. Education and social status also associated with increase in profit; and spirit of capitalism associated with increase in sales. The representative was limited to the women entrepreneurs of Rajasthan. This research paper also considered only few variables that are limited to cultural and social factors. This paper will give an insight to policymakers, and government to develop programs and policies for the growth of women entrepreneurs. The research much emphasis that the findings will provides a future direction to the women entrepreneur as to how they can enhance their firm performance on focusing the relevant cultural and social factors.

KEY WORDS: CULTURAL FACTORS, SOCIAL FACTORS, WOMEN ENTREPRENEURS, BUSINESS PERFORMANCE IN RAJASTHAN.

INTRODUCTION

"When a women moves forward, the family moves, the village moves and the nation moves" Pandit Jawahar Lal Nehru. According to Schumpeter female entrepreneur are the women who imitate or adopt, innovate business activity. "Kamal Singh a woman entrepreneur from Rajasthan, has defined woman entrepreneur as a confident, innovative and creative woman capable of achieving self-economic independence individually or in collaboration, generates employment opportunities for others through initiating, establishing and running the enterprise by keeping pace with her personal, family and social life" (cited by Yogitha Sharma, 2013). According to Goyal and Parkash, female or a group of female who starting, operating and managing a business is called women entrepreneurship.

Unless female – who constitute about half (48.59%) of the population – are consolidated into progressive change underway, the economy will compromise on creativity & innovation and productivity. In India, women have not got the deserving place. They have not been got a proper attention despite having the capability to become businesswomen. To begin with, female's task has been

limited in the household, whereas, nowadays female are come out for revenue producing activity that participate financially to the household and society development. Although, setting up a Business is viewed as a 'male' realm because their jobs are commonly connected to unfeminine action ("Dickerson & Taylor, 2000; Verheul, Uhlaner & Thurik, 2005"). Women are now participated in business affair perhaps not just as a way for income generation but also as a way of favorable community effect for women and also for their community surroundings (UNIDO, 2001). Thus, lack of equilibrium between women ambition and the viewed estimate of the labor market proposal lead to involvement of women entrepreneurship as per (Lee and Venkataraman, 2006). Economic, cultural, social, religious, and psychological variables were used in a study by (Habib, Roni, & Haque, 2005). Also, study showed the variables impact on origination and performance of women entrepreneurs business.

Participation of women is important for any country for economic growth and nation building. Economic development and growth can't be achieved without considering 48.59% women of India's 129.02 Crore populations. Women unpaid care work is not considered in GDP (Bharathi and Kaveeswarar) that increase gender discrimination. In a worldwide survey related to the gender gap from 144 countries, India ranks 87 according to the Global Gender Gap Index (GGGI Report, 2016). India has recorded sex ratio is 943 and in Rajasthan it is 921 as per Census of India. In India, literacy rate of female has recorded 70.3% that is low as compared to male 84.7%. Rajasthan has recorded low level of literacy among women i.e. 57.6% as compared to male literacy rate 80.8% (Men and Women India Report, 2016). As per MIWE from 57 countries survey on women entrepreneurship ownership India has been ranked 47th position (MIWE, 2018). It has reflected that India has very low business ownership as compared to other countries.

Literature Review: Women owned business progress increasing (Agarwal, 2016). Through the setting up of own business women entrepreneurs create employment opportunities for others, participate in creative and innovative activities and represent a crucial part in countries economic progress (Agarwal, 2015). Development of female entrepreneurship in India is lower compared to other economies cited by (Shanta V.) in their study. Another study by (Agarwal, 2018) also showed the similar result that compared to other economies Indian female entrepreneurship level is very less. A study by (Kumari & Kaushik & Lodha et.al, 2010) conducted in Rajasthan, indicated "if the women are to be successful entrepreneurs, they are to be educated, skilled and trained sufficiently and to be supported rigorously by external environment to handle their entrepreneurial problems". Study also showed that women entrepreneurs faced many problems. Another study by (Sengar, 2017) also showed the same results on problem faced by women entrepreneur in Rajasthan.

The prior theory on the effect of socio-cultural environment on entrepreneurship was presented by a German sociologist Max Weber. A crucial role played by Society in entrepreneurship development, Weber described in his theory. This is because that people learn his principles from the society's principles, increased so and organized system within which he lives. Author also describe that society's culture has significant effect on the thinking & thought and action/ performance of person and their temperament to survival. And indeed, whether or not a person would grow and setting up a business would base on his temperament and principles adaption. Although, lot of the obstacles showed for different economies women entrepreneurs are similar. Encounter challenges are related to socio-cultural variables ("Ehigie & Idemudia, 2000; Ehigie & Umoren, 2003; Kitching & Woldie, 2004"). Reason behind for this is that some social and cultures principles & traditions have an important part in identifying who grow as an entrepreneur.

Interesting researches allowed Entrepreneurship and Social Inclusion by (Fielden and Dave, 2004) recommend that socially formed challenges were in charge of for limiting female's growth. (Venugopal, 2016) has found importance of social support for women entrepreneur. Social support help in building self confidence and motivate for setting up a business (Rahim, 1996) also cited by (Lenka, 2017). Social help reduces the impact of work stressors results presented by a study of (Chay, 1993). Also, social support have powerful link in the business world that create ease for women in attaining growth of enterprise. (McClelland et. al., 2005) reported that the networking has seen as a way of business development for women entrepreneurs in Canada, Singapore and Ireland. Women entrepreneur faced culture challenges are one of the most significant issues in this business sector. "Women entrepreneurship has got many opportunities but the effect of culture challenges these opportunities in particular if we compare UK and Sub-Saharan women entrepreneurship" (Essays, UK, 2018). (Amrita, 2018: Jha, 2018) used socio-cultural factor as a critical success factor for women entrepreneurship.

Findings from a study by (Wajih & Rahman, 2014) indicated 24.5% of the respondents are reported gender inequalities have the effect over the performance of women entrepreneur. Also, author found that more research is required in the domain of social variables, which have an important role for women entrepreneurs' intention to start an enterprise and to become successful. Women entrepreneurs understanding related to social were influenced by higher educational accomplishment (Bussey & Bandura, 1999). Findings from a study by (Gurunani, 2014) reported that education is important factors that lead to entrepreneurial performance. (H. Giwa & M. Babakatum, 2019) showed the impact of cultural and gender roles on growth of female entrepreneurship. Results also showed a significant association of socio cultural variables with growth of women entrepreneurship. In most cases successful entrepreneurship is the result of highly educational attainment cited by (A. Olasunkanm, 2017).

Findings from another study by (S. Gurnani, 2014) indicated that education have effect on entrepreneurial innovative behavior. (Jyoti & Sharma & kumari et.al, 2017) reported that family support influence to majority of women to start an enterprise. Study also showed that social support has effect on orientation is partially accepted. (D. Bhoganadam, 2015) results showed that socio cultural factors have effect on Indian entrepreneurship it can be positive or negative. Study by (Barik, 2017) showed that culture factors and support from family and friends help individual to become entrepreneur and grow as an entrepreneur. Personality factors, family & friends support, business management training, gender, and financial access have a crucial favorable impact (Wongnaa, C. A., & Seyram, A. Z. K, 2014). Study by (R. Rupavataram, 2014) suggested that entrepreneurial performance have effect of gender role orientation. Cultural norms were found in gender specific work (Shastri, shastri and Pareek, 2019).

Women are starting business due to low job opportunities, low family income, and low satisfaction with a current employment or the requirement for flexible task (Robinson, 2001). Women entrepreneur motivate to participate in highly growth business activities due to social norms, helps from family and friends (Agarwal, 2016). Study also showed that individual performance have been affected by social influence. (Amrita, 2018) used family support & nature, and religious belief as a key success factors for women entrepreneurs. For the economic development, entrepreneurship and education are commonly viewed as key variables (Rao, 2014). Education assists to find finance sources, build confidence and remove barrier related to lack of information (Bhardwaj, 2014). Research also found that there is a positive association among education and female to start up their unit.

Business performance is a complicated parameter and is hard to analyses (Shane and Venkataraman, 2000). Reviewed by (Chatterjee, 2016) it is that the entrepreneur comprehends and measure business performance in several scales. The set parameters can be in terms of financial position of a business. Use of performance factors can be show measurement of business performance. Recognizing the factors of business performance is rigorous, as it has several scales (Brockner et al., 2004; Fisher et al., 2014). Business performance can be measured through the return on investment, sales and profit (Masuo et. al., 2001). Similar study by (Rajan & Muralidharan P & Ravi et.al, 2019) also covered profit increase, sales increase, and return on investment as a success factors for business performance. There are many studies was used profitability as a success factors (Selvam et.al. 2016; Chatterjee, 2016).

Research Gap: The above literature review showed that the studies on social and cultural factors influence and women entrepreneurs' performance have been conducted in the other state of India and very less work has been done in Rajasthan which only provides the information about women entrepreneur's characteristics and problem faced by women entrepreneur on limited sample size. Reviewed literature also showed that the hardly any research has done the factors combined representation. There is a crucial need to develop an understanding of the social and cultural factors association with women entrepreneurs' business performance.

Objectives: The above shown research gap, the present research aims to build an understanding on key factors related to social and cultural factors affect women entrepreneurs also found the association of these factors with entrepreneurs performance in Rajasthan. This study has four objectives:

1. To examine the Social factors of women entrepreneurs in Rajasthan.
2. To examine the cultural factors of women entrepreneurs in Rajasthan.
3. To discover the association between social variables and women entrepreneurs business performance in Rajasthan.
4. To discover the association between cultural variables and women entrepreneurs business performance in Rajasthan.
5. To give suggestions for improving business performance.

Hypothesis: On the basis of above literature review and objectives we generated the following Hypothesis.

RESEARCH METHODOLOGY

It is showed the method of data collection, detail about the variables used and briefly discussing about techniques used to data analysis.

Research Design And Sample: Descriptive survey design was used for this research paper. Descriptive research intended to examine the statistical data in terms of research. The target population was 350 of women entrepreneurs from Rajasthan, India. A self-administered questionnaire was practiced to gather data.

Data Collection: Research paper analyses the social and cultural factors association with women entrepreneurs' performance. Four district in Rajasthan, namely Jaipur, Alawar, Hanumangrah, and Chittorgarh have been selected for sampling frame of the research. Women entrepreneurs of the above four District have been selected as a population of the study. Self-administered Questionnaire was decided to explore data. The questionnaire was formed into four parts, that covered information related to Demographic characteristics, Business information, social and cultural variables and growth indicators. The women entrepreneurs were needs to choose from a Dichotomous answer for social and cultural factors and performance questions.

Data Analysis Techniques: The SPSS software (version 16.0) was selected to access the statistical analysis. Various statistical tools were used in analyzing the findings, to represent the women characteristics and

business profile, frequencies and Percentage was used. Evaluation of factors defined by the use of mean, and standard deviation while cultural and social factors association with performance factors defined by the use of Chi- square test.

Hypothesis Table		
1.1	H0	No association between religious belief and profit increase
	H1	Association between religious belief and profit increase
1.2	H0	No association between religious belief and sales increase
	H1	Association between religious belief and sales increase
1.3	H0	No association between religious belief and investment increase
	H1	Association between religious belief and investment increase
2.1	H0	No association between gender discrimination and profit increase
	H1	Association between gender discrimination and profit increase
2.2	H0	No association between gender discrimination and sales increase
	H1	Association between gender discrimination and sales increase
2.3	H0	No association between gender discrimination and investment increase
	H1	Association between gender discrimination and investment increase
3.1	H0	No association between spirit of capitalism and profit increase
	H1	Association between spirit of capitalism and profit increase
3.2	H0	No association between spirit of capitalism and sales increase
	H1	Association between spirit of capitalism and sales increase
3.3	H0	No association between spirit of capitalism and investment increase
	H1	Association between spirit of capitalism and investment increase
4.1	H0	No association between family and friends support and profit increase
	H1	Association between family and friends support and profit increase
4.2	H0	No association between family and friends support and sales increase
	H1	Association between family and friends support and sales increase
4.3	H0	No association between family and friends support and investment increase
	H1	Association between family and friends support and investment increase
5.1	H0	No association between education and profit increase
	H1	Association between education and profit increase
5.2	H0	No association between education and sales increase
	H1	Association between education and sales increase
5.3	H0	No association between education and investment increase
	H1	Association between education and investment increase
6.1	H0	No association between social status and profit increase
	H1	Association between social status and profit increase
6.2	H0	No association between social status and sales increase
	H1	Association between social status and sales increase
6.3	H0	No association between social status and investment increase
	H1	Association between social status and investment increase
7.1	H0	No association between social responsibility and profit increase
	H1	Association between social responsibility and profit increase
7.2	H0	No association between social responsibility and sales increase
	H1	Association between social responsibility and sales increase
7.3	H0	No association between social responsibility and investment increase
	H1	Association between social responsibility and investment increase

FINDINGS AND DISCUSSION

This section of research paper represents the women entrepreneurs profile and enterprises profile. Also, represent the evaluation of the factors and association of social and cultural factors association with performance factors.

Profile Of Respondents: Examined the characteristics of the women entrepreneur regarding Age, and education

and also the business characteristics regarding business running year, and type of business organization. According to the Table1, Ages of the women when they start their firm, around two third of them were in between the ages group of 26-35 years (62 %) while other women were below 25 years (28.9%) respectively. The majority (36.9%) of the women have below matriculation degree while 28% women are illiterate. Majority (36.3%) of the women have been running their business between the ages of business 0-5 years. It was found that majority of the women organization (62.9%) are sole proprietorship, 36.6% are partnership firms and only 0.6 are cooperative.

Evaluation of Factors: Table no.2 shows statistical analysis of cultural, social and performance factors. Findings shows that majority of the respondents agree that the

entrepreneurs has no religious belief (x=1.91, SD=0.293), and gender discrimination (x =1.89, SD=0.308). Half of the women disagreed for spirit of capitalism (x =1.41, SD=0.493). Around half of the women said yes for support from family & friends (x =1.43, SD=0.401), Education (x =1.53, SD=0.500), social status (x =1.35, SD=0.479). Around one third women (28%) agreed for social responsibility (x =1.72, SD=0.450). It was found that majority of the women agreed for increase in profit (x=1.17, SD=0.372), increase in sales (x=1.16, SD=0.367), and increase in investment (x=1.17, SD=0.377).

Association of Cultural and Social Factors With Performance Factors: Table no 3 shows the findings of chi square analysis of the association of cultural and social factors with performance factors. The studies of (Mung'atu, 2017; Zizile, 2018) were used chi square test to define the relationship among factors.

Table 1. Profile of the Respondents						
Age of women when they start business:						
	Below 25	26-35	36-45	46-55	Above 55	Total
Percent	28.9	62.0	8.0	0.9	0.3	100.0
Education of Women:						
	Illiterate	Below Matriculation	Matriculation	Intermediate	Graduate	Post-Graduate
Percent	28.0	36.9	11.7	10.6	9.4	3.4

Business Age								
	0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40
Percent	36.3	29.7	14.6	6.9	5.4	4.9	0.3	2.0

Type of Business Organization			
	Sole Proprietorship	Partnership	Cooperative
Percent	62.9	36.6	0.6

Source: Authors' compilation

Table 2. Descriptive Analysis of factors					
S. No.	Factors	Frequency Yes (%)	No (%)	Mean	S.D.
A	Cultural Factors				
1	Religious Belief	9.4	90.6	1.91	0.293
2	Gender Discrimination	10.6	89.4	1.89	0.308
3	Spirit of Capitalism	58.6	41.4	1.41	0.493
B	Social Factors				
4	Support from Family & Friends	56.6	43.4	1.43	0.496
5	Education	46.6	53.4	1.53	0.500
6	Social Status	64.6	35.4	1.35	0.479
7	Social Responsibility	28.0	72.0	1.72	0.450
C	Performance Factors				
1	Profit Increase	83.4	16.6	1.17	0.372
2	Sales Increase	84.0	16.0	1.16	0.367
3	Investment Increase	82.9	17.1	1.17	0.377

Source: Authors' compilation

The Pearson chi-square value of religious belief and increase in profit, from chi-square test in the table no 3 shows that the calculated value is 10.324 greater than tabulated value at a 5% significance level is 3.411 therefore the alternate hypothesis is accepted in this case. It is concluded that religious belief associated with increase in profit. There was also found an association among religious belief and increase in sales ($\chi2$= 8.145> $\chi2$ (0.05, 1) = 3.411), and religious belief and increase in investment ($\chi2$= 16.395> $\chi2$ (0.05, 1) = 3.411). The Pearson chi-square calculated value of gender discrimination and increase in profit is 3.272 less than tabulated value at a 5% significance level is 3.411 therefore the null hypothesis is accepted in this case. While there was an association identified among gender discrimination and increase in sales ($\chi2$= 11.272> $\chi2$ (0.05, 1) = 3.411), and gender discrimination and increase in investment ($\chi2$= 19.843> $\chi2$ (0.05, 1) = 3.411). no association found among spirit of capitalism and increase in profit ($\chi2$= 0.331< $\chi2$ (0.05, 1) = 3.411), and spirit of capitalism and increase in investment ($\chi2$= 1.233< $\chi2$ (0.05, 1) = 3.411) but spirit of capitalism is associated with increase in sales ($\chi2$= 5.330> $\chi2$ (0.05, 1) = 3.411).

Table 3. Association of Cultural and Social Factors with Performance Factors

S.no.		Hypothesis	Value (χ2)	Decision	Explanation
1.1	H0	No association between RB and PI	10.324	Reject	χ2= 10.324> χ2 (0.05,1)= 3.411
	H1	Association between RB and PI		Accept	
1.2	H0	No association between RB and SI	8.145	Reject	χ2= 8.145> χ2 (0.05,1)= 3.411
	H1	Association between RB and SI		Accept	
1.3	H0	No association between RB and II	16.395	Reject	χ2= 16.395> χ2 (0.05,1)= 3.411
	H1	Association between RB and II		Accept	
2.1	H0	No association between GD and PI	3.272	Accept	χ2= 3.272< χ2 (0.05,1)= 3.411
	H1	Association between GD and PI		Reject	
2.2	H0	No association between GD and SI	11.272	Reject	χ2= 11.272> χ2 (0.05,1)= 3.411
	H1	Association between GD and SI		Accept	
2.3	H0	No association between GD and II	19.843	Reject	χ2= 19.843> χ2 (0.05,1)= 3.411
	H1	Association between GD and II		Accept	
3.1	H0	No association between SC and PI	0.331	Accept	χ2= 0.331< χ2 (0.05,1)= 3.411
	H1	Association between SC and PI		Reject	
3.2	H0	No association between SC and SI	5.330	Reject	χ2= 5.330> χ2 (0.05,1)= 3.411
	H1	Association between SC and SI		Accept	
3.3	H0	No association between SC and II	1.233	Accept	χ2= 1.233< χ2 (0.05,1)= 3.411
	H1	Association between SC and II		Reject	
4.1	H0	No association between SFF and PI	0.855	Accept	χ2= 0.855< χ2 (0.05,1)= 3.411
	H1	Association between SFF and PI		Reject	
4.2	H0	No association between SFF and SI	0.244	Accept	χ2= 0.244< χ2 (0.05,1)= 3.411
	H1	Association between SFF and SI		Reject	
4.3	H0	No association between SFF and II	0.765	Accept	χ2= 0.765< χ2 (0.05,1)= 3.411
	H1	Association between SFF and II		Reject	
5.1	H0	No association between E and PI	4.083	Reject	χ2= 4.083> χ2 (0.05,1)= 3.411
	H1	Association between E and PI		Accept	
5.2	H0	No association between E and SI	0.810	Accept	χ2= 0.810< χ2 (0.05,1)= 3.411
	H1	Association between E and SI		Reject	
5.3	H0	No association between E and II	0.090	Accept	χ2= 0.090< χ2 (0.05,1)= 3.411
	H1	Association between E and II		Reject	
6.1	H0	No association between SS and PI	3.760	Reject	χ2= 3.760> χ2 (0.05,1)= 3.411
	H1	Association between SS and PI		Accept	
6.2	H0	No association between SS and SI	0.002	Accept	χ2= 0.002< χ2 (0.05,1)= 3.411
	H1	Association between SS and SI		Reject	
6.3	H0	No association between SS and II	0.662	Accept	χ2= 0.662< χ2 (0.05,1)= 3.411
	H1	Association between SS and II		Reject	
7.1	H0	No association between SR and PI	0.318	Accept	χ2= 0.318< χ2 (0.05,1)= 3.411
	H1	Association between SR and PI		Reject	
7.2	H0	No association between SR and SI	1.162	Accept	χ2= 1.162< χ2 (0.05,1)= 3.411
	H1	Association between SR and SI		Reject	
7.3	H0	No association between SR and II	0.144	Accept	χ2= 0.144< χ2 (0.05,1)= 3.411
	H1	Association between SR and II		Reject	

Source: Authors' compilation

It was observed that Pearson chi-square calculated value of support from family & friends and increase in profit is 0.855 less than tabulated value at a 5% significance level is 3.411 therefore the null hypothesis is not rejected in this case and concluded that there is no association found between support from family & friends and increase in profit. It was also observed that there is no association identified among support from family & friends and increase in sales (χ2= 0.244< χ2 (0.05, 1) = 3.411), and support from family & friends and increase in investment (χ2= 0.765< χ2 (0.05, 1) = 3.411). In terms of education, it was noticed that education have association with increase in profit (χ2= 4.083> χ2 (0.05, 1) = 3.411) but there was no association found among education

and increase in sales ($\chi 2= 0.810 < \chi 2\ (0.05, 1) = 3.411$), education and increase in investment ($\chi 2= 0.090 < \chi 2\ (0.05, 1) = 3.411$).

Similarly, social status have association with increase in profit ($\chi 2= 3.760 > \chi 2\ (0.05, 1) = 3.411$) but there was no association identified between social status and increase in sales ($\chi 2= 0.002 < \chi 2\ (0.05, 1) = 3.411$), and social status and increase in investment ($\chi 2= 0.662 < \chi 2\ (0.05, 1) = 3.411$). There was no association found among social responsibility and increase in profit ($\chi 2= 0.318 < \chi 2\ (0.05, 1) = 3.411$), social responsibility and increase in sales ($\chi 2= 1.162 < \chi 2\ (0.05, 1) = 3.411$), and social responsibility and increase in investment ($\chi 2= 0.144 < \chi 2\ (0.05, 1) = 3.411$).

CONCLUSION

This research seeks to discover the demographic characteristics of the women entrepreneurs and association of cultural and social factors with performance factors. Findings of this research disclosed that majority of the women started their business in age of 26-35 and around one third women were found illiterate and mostly women (36.9%) have below matriculation education. Only 3.4% women has post-graduation certificate. Furthermore around one third of women have been running their business since 0-5 years and 29.7% running from 6-10 years. Also, 62.9% women have sole proprietorship organization. The results also showed that religious belief have association with all performance factors. It was also found association of gender discrimination with increase in sales and increase in investment. It is observed that spirit of capitalism associated with increase in sales and education factor and social status have association with increase in profit. Lastly this research discovered that there is no association found of support from family & friends, and social responsibility with performance factors.

Recommendations: According to the findings of this research paper, the recommendations are suggested to women entrepreneur as to how they can enhance their firm performance. Women entrepreneur need to focus to lower the religious belief and gender discrimination that will enhance the performance of business. Also, focus to increase education and social status for increase in profit and performance of business.

Limitations: The representative was limited to the women entrepreneurs of Rajasthan. This research paper also considered only few variables that are limited to cultural and social factors.

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Customer Satisfaction Towards the Services Provided by Life Insurance Companies Within Pali City

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ABSTRACT

Customer Satisfaction is the prime of any service industry. Because only a customer can bring prosperity and success to any service organization. So, it is more important to the service organizations to make satisfy the needs of their customers. In the adventures of life itself, life may fail and death may happen, causing suffering to the dependents. The human life is really unpredictable. Life insurance is therefore the most significant of all forms of insurance. A satisfied customer is like a word of mouth advertisement for any organization. The existing customer needs should be identified and satisfied well rather than only concentrating on the new accounts. In this study, an attempt has been made to find out the satisfaction level of the policyholder of the life insurance sector within Pali City. A sample of 50 respondents has been taken for the study as Primary Data. For the selection of the sample, non- probability convenience sampling technique used. The findings of the study reveal that majority of the customers are very satisfied.

KEY WORDS: LIFE INSURANCE, DEMOGRAPHIC FACTORS, REASONS OF PURCHASE, CUSTOMER SATISFACTION AND PERCEPTION.

INTRODUCTION

Life Insurance can be defined as a contract between an insurance policyholder and an insurance company, where the insurer promises to pay an amount in exchange for a premium, after a set period or death of an insured person. Life insurance is a symbol of the civilization and the culture which solves the economic problems of a person through society more clarify, the meaning of Life Insurance:

- It is necessary.
- It is a provision of income when losing work energy.
- It is the insurance of lifestyle with life.

Today, there is a total of 24 Life Insurance Companies operating within the country. The insurance sector is a huge one and has been spreading at a speedy rate of 15-20% together with banking services, Insurance services about 75% to the country's GDP. The Life insurance is a different kind of insurance than fire insurance and Marine Insurance. Formerly, In India, the Life Insurance business was in the hands of joint-stock companies. By the Life Insurance Ordinance of 1956, the management and control of the business is vested with the Central Government of India. Thus, Life Insurance Corporation took its shape. The main advantages of Life Insurance:

- In case of death of the insured person, the full sum assured is benefited under the life insurance policy. In ordinary savings only the accumulated savings become available.
- It protects the claims of the creditors by affecting a valid assignment of the policy.
- It also stands as security against loans.
- Income taxes act exempted from the payments of taxes on income devoted to the Insurance payment.

Customer Satisfaction: Customer satisfaction is a theoretical concept and the state of satisfaction will differ from customer to customer and product/ service to product/service. Satisfaction behavior depends on following variables:

- Psychological variables
- Physical variables and
- Other variables such as the customer may have other products against which the customer can compare the organization's products.

If the providers get these following dimensions right, the customers will hand over the keys to their loyalty towards the particular organization. Because they will have received service excellence according to what's essential to them. The four dimensions of customer satisfaction are:

Source: (https://www.myfeelback.com/en/blog/customer-satisfaction-4-key-measures)

Literature Review: Literature review is a summary and the evaluation of the significant research published on a topic and a secondary source because it is an overview of existing research on the topic. The Literature review regarding the study is as follows: According to Dr. Krishna Banana and R. VijayaNaik (2018), Under the titled "A Study On Customer Perception On Life Insurance Policies In India (With The Reference To Prakasam District In Andhra Pradesh)". it is revealed by this study that LIC dominates the Indian insurance industry In today's competitive world, Customer Service is the critical success factor in a company, and providing top-notch customer services. According to Dr. N. Senthil Kumar and K. Selvamani (2016), studied "An Overview Regarding Life Insurance Industry In India". They revealed that LIC and IRDA must concentrate on introducing the new plans for facing the health problems of human beings. The LIC should educate the significance of insurance to the public through the agent and corporate social responsibility (CSR) activity.

According to Arvind Kumar Singh, (2014) titled," Indian Life Insurance Industry Changing Scenario and Need for Innovation". This study revealed about the current scenario of the Life Insurance Sector. It is concluded that at present the market is moving rapidly and aggressively. There are competition and force to more ahead. The features of this expansion strategy are hunting for a new business looking up for the potential and grabbing it. According to Ruby Singh and Dr. AmitGautam (2014) under the title "Consumer Protection Laws & Regulations In Indian Insurance Industry "it is concluded that there is the need for improvements to the generic consumer protection framework in India-with an emphasis on the development of the best practices in co-regulation and specific improvements in the insurance industry.

According to PreetiUpadhyay, (2013) under the titled "Satisfaction of the Policy Holders Protection in Insurance Sector: A Case Study" Various products and plans offered by the Insurance Companies have been studied and awareness about public sector companies and private sector companies have been analyzed. it is concluded that the overall business of life insurance has been increased due to privatization but still, a huge Indian population life is being uninsured. Although LIC is a massive player in the life insurance business whereas the private insurance companies are moving at a fast pace.

The Objective of The Study: The main objective is to study the satisfaction level of policyholders about services provided by Life insurance companies within Pali city.

Hypothesis

H_0: The policyholders are not satisfied with the services provided by the Life Insurance companies in Pali city.

H_1: The policyholders are satisfied with the services provided by the Life Insurance companies in Pali city.

Research Methodology: In this study, A questionnaire was developed for the data collection with the help of the life insurance policyholders. Using convenient sampling fifty responses were collected from Pali city the researcher has used a descriptive approach in nature. The research Methodology to be adopted for this proposed research is described in the following subsections: the Sample Size, the Sampling Unit, the Sampling Technique, and the Data Collection. Also, the different analytical tools which are proposed to be used for the analysis of the collected data to derive at the conclusions are also being explained.

Sample Size: Sample size refers to the participants included in the study. In the study, A sample of fifty respondents was taken for the survey and data analysis.

Sampling Unit: The sampling unit represents each unit is regarded as an individual and indivisible when the selection is made. In the study, the Sample unit consists of customers having a life insurance policy within Pali city.

Sampling Technique: The sampling technique refers to the process by which the entities of the sample have been selected. A non-probability sampling technique (convenience sampling) was used for the survey.

Data Collection: Data collection is significant for building the base for the research work. Data is the premise by which the analysis is done and the knowledge is created. Primary data was collected with the help of a structured questionnaire from 50 respondents of life insurance companies in Pali city.

Data Analysis: As mentioned above the study is based on a sample of fifty customers of Life Insurance companies. The demographic profile of the customers is shown in the Table 1 which is as follows:

There are two main reasons to analyze the demographic features of the respondents regarding the study. First to understand the life insurance customers and second to analyse customer satisfaction level based on the demographic factors. The Demographic profile involves Gender, Age, Marital Status, Educational Qualification, and Annual Income.

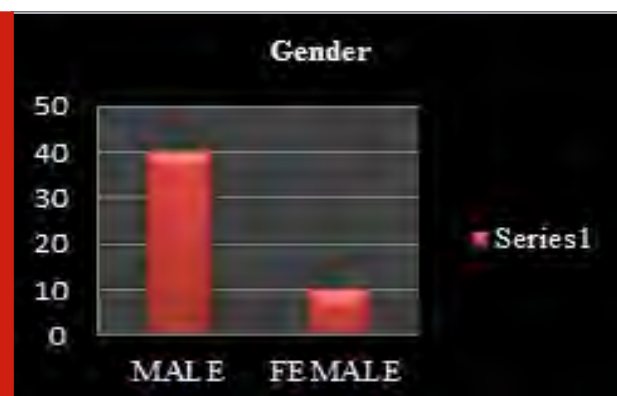**Graphical Presentation of Demographic Factor**
1. Gender and Life Insurance Policyholder: In the study, It has revealed that 40 (80%) respondents are Male out of 50 and 10 (20%) is Female. The graphical presentation of policy-holders based on Gender is as follows:

2. Age and Life Insurance Policy–Holders: In the study, It has revealed that Most of the respondents are in the age group "26-40 years" and There is no policyholder found in the "Below 10 years" age group. The graphical presentation of policy-holders based on Age group is as follows:

3. Educational Qualification and Life Insurance Policy–Holder: Majority of the respondents are Graduate (54%) followed by Post Graduate (24%), Professional (16%), High School (4%) and Intermediate (2%). The graphical presentation of policy-holders based on Educational Qualification is as follows:

Table 1. Demographic Characteristics of Sample Customers (n=50)			
Demographic Factors		**No. of Respondents %**	
		F	**%**
Gender	Male	40	80%
	Female	10	20%
Age	Below 10 Years	0	0%
	10-25 Years	2	4%
	26-40 Years	29	58%
	41-55 Years	11	22%
	55 And Above	8	16%
Marital Status	Married	45	90%
	Unmarried	2	4%
	Widow	1	2%
	Divorcee	2	4%
Educational Qualification	High School	2	4%
	Intermediate	1	2%
	Graduation	27	54%
	Post Graduation	12	24%
	Professional	8	16%
Annual Income	No Income	0	0%
	Less Than One Lac	2	4%
	One Lac- Less Than Rupees Two Lac	8	16%
	Two Lac – Less Than Rupees Five Lacs	15	30%
	Rupees Five Lacs And Above	25	50%

4. The Marital Status and Life Insurance Policy–Holder: Majority of the respondents are Married. Out of 50 respondents only two are Unmarried (4%), two are Divorcee (4%) and one is Widow (2%).The graphical

presentation of policy-holders based on Marital Status is as follows:

Table 2. Life Insurance Sector and the Reason to Purchase Life Insurance Policy

	Response	Frequency	Percentage
Sector	Public Sector	18	36%
	Private Sector	14	28%
	Both	18	36%
Reason Behind Purchasing Policy	Risk Covering	8	16%
	Investment Purpose	17	34%
	Security	4	8%
	Tax Saving	9	18%
	All of the Above	12	24%
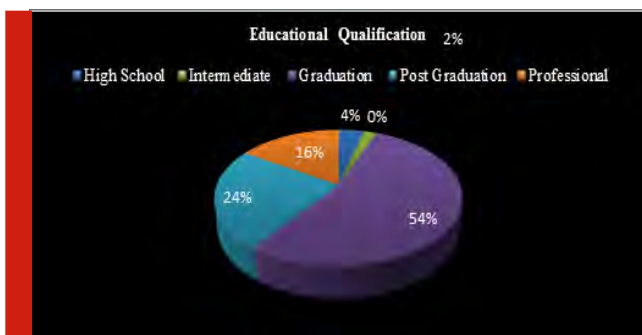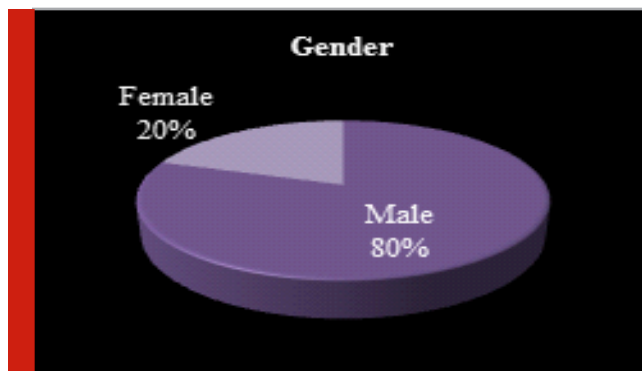
5. Family Income Per Annum And Life Insurance Policy–Holders: Majority of the respondents are belong to "five lacs and above" (50%) Income Group followed by "Two Lac – Less than rupees five Lacs" (30%), "One Lac- Less than rupees two Lacs" (16%), "Less than One Lac Rupees" (4%) whereas No respondent is in No Income Group. The graphical presentation of the policy-holders based on Family Income (Per Annum) is as follows:

Table 3. How would you rate overall satisfaction for the Life Insurance companies?

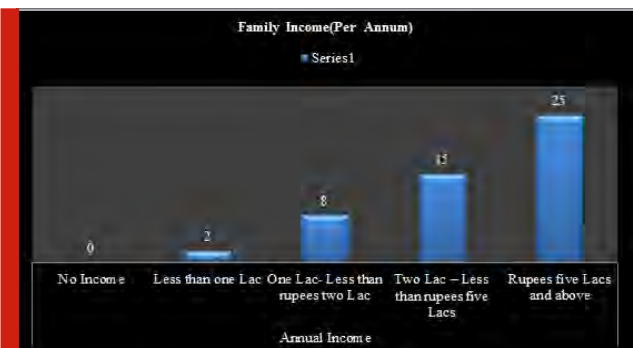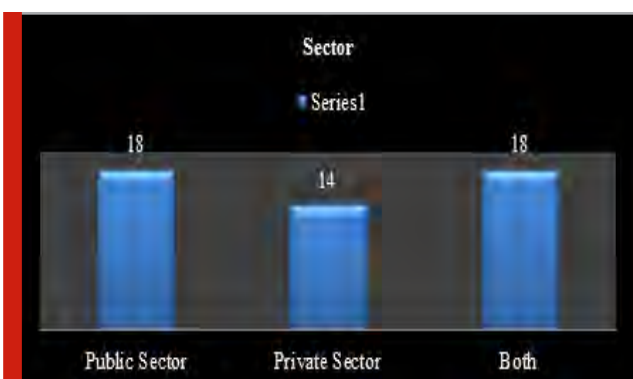|	Responses	Frequency	Percentage
Level of Satisfaction	Extremely Satisfied	15	30%
	Very Satisfied	27	54%
	Satisfied	6	12%
	Not at All Satisfied	2	4%

The Table 2 reveals that 18 (36%) of the respondents are customers of only public sector, 14 (28%) of respondents are customer of only private sector whereas 18 (36%) of the customers have purchased life insurance policy from both the sectors. 34% of the respondents has purchased policy for investment purpose,18% of the respondents have purchased policy for tax saving, 16% of the respondents have purchased policy for risk covering, 8% of the respondents have purchased policy for security purpose whereas 24% of the respondents have purchased policy for all the above purposes. The graphical presentation of customers' based on their sector of purchasing policy and the reasons of purchasing policy are as follows:

Table 3 reveals that 30% of policy holders are extremely satisfied, 54% are very satisfied, 12% are satisfied whereas 4% are Not at all satisfied with the services provided by the life insurance companies. The graphical presentation of level of satisfaction is as follows:

Findings of The Study
- The table 1 results that 80% of the respondents are

Male and 20% are Female.
- Most of the respondents belong to the age group "26-40 years" and least respondents are in the age group "below 10 years".
- Majority of the respondents are Graduate (54%) followed by Post Graduate(24%), Professional(16%), High School (4%) and Intermediate (2%).
- Majority of the respondents are Married (90%)
- Out of 50 respondents only two are Unmarried (4%), two are Divorcee (4%) and one is Widow (2%).
- Majority of the respondents 50% fall in the income range of "five lacs and above".
- It has revealed from the Table 2 that 36% of the respondents are customers of the public sector, 28% of the respondents are customers of the Private Sector whereas 36% are customers of both the sectors.
- Most of the respondents (34%) has purchased the policy for investment purpose whereas only 8% respondents has purchased life insurance policy for the security purpose.
- It has revealed from Table 3 that 54% of policyholders are very satisfied, 30% are extremely satisfied and 12% are satisfied whereas 4% are not at all satisfied.

Limitations of the Study
- The study is limited to 50 respondents of Pali City.
- It may be possible there was a biasness in the responses given by the respondent,which ultimately constrains the result of study.

CONCLUSION

From the above mentioned study it can be concluded that life insurance companies should improve their working and services so that not a single customer will be dissatisfied as in the study researcher found that out of 50 respondents 2 are not at all satisfied. In future, companies should work hard to satisfy their customers because a satisfied customer is a word of mouth and it is easy to retain a customer than making a new customer. In order to compete both the public and the private sector have to focus on specific needs of policy-holders. As the life insurance sector is mainly depends upon insured, life insurance companies have to try fulfilling the expectations of policy-holders. Life insurances companies should introduce more products regarding children to have customer of that age group.

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Effectiveness of Kanyashree Prakalapa in Empowering Women in South 24 Parganas District of West Bengal: What Parents Think About the Role of Public Libraries

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ABSTRACT

The present study conducted in Bhangar- I Community Development Block of South 24 Parganas district among 100 parents explores the effects and benefits of those whose daughters received one-time Kanyashree scholarship grant of Rupees Twenty Five Thousand after attaining the age of 18 years. The principal objective of the study is to assess the role of public libraries in empowering women. Ten marginal variables like age of the respondent, educational status, involvement towards the society, association with self help group, reason behind the association with self help group, availing bank loan, reason behind taking the bank loan, nature and extent of savings, attention towards daughter's education and difficulties towards daughter's education had massive implications on the level of perception of parents about the effectiveness of Kanyashree one time grant towards the empowerment of women. It has been also established that the seven casual variables such as, financial condition of the family, housing condition, availing bank loan, reason behind taking the bank loan, expenditure towards daughter's education, difficulties towards daughter's education and role of public libraries towards women empowerment had immense bearing on the level of perception of parents about the empowerment of women. It is further recognized that variables such as, connection with rural public libraries, role of public libraries in empowering women, services available in rural libraries, the activities of public libraries, and upgrading of public libraries, etc. had a great significance on the level of parents' view to evaluate the function of public libraries regarding women empowerment.

KEY WORDS: PUBLIC LIBRARY, WOMEN EMPOWERMENT, GIRL CHILD EDUCATION, AND KANYASHREE PRAKALPA ETC.

INTRODUCTION

The socio-economic development of a country cannot be fully realized as long as its women are restricted to subordinate status and its various talents remain untouched. Due to the pull and push factors, female entrepreneurship is now a reality. Between the pull and push factors, women see it as a real challenge and are eager to do something new accepting and pursuing an independent profession. To achieve the goal of social justice, it is therefore necessary to harness the potential of women, especially rural women. They play a key role in the sustained and rapid economic development of rural areas. The ultimate prosperity and development of a country depends on the actual development of women and their empowerment. Public libraries have a great role for the improvement of the society. On the other hand women are empowered by the public libraries through different types of activities like various types of orientation programs, seminars and workshops etc. The Government of West Bengal launched Kanyashree Prakalpa which acts as a pull and push factor to achieve the ultimate goal of

women empowerment. The different researchers tried to explore the field of women empowerment and public library system which are given below:

Graham (2010) conducted the relationship between education and women's empowerment in the public sphere. It is important to note that their empowerment in the private sphere has been less fully developed in empirical studies. This study also expresses how women who participated in an innovative secondary education program in rural Honduran Garifuna communities were able to negotiate more equitable roles in their intimate relationships. According to Berdychevsky, Gibson and Poria (2013), "The findings are discussed primarily with respect to these two types of experiences through the progression of five issues that appear to represent much of the interviewees' discourse regarding their sexual behavior: the unique atmosphere in the tourist environment; moving out of everyday boundaries in women's sexual behavior; personal vs. social boundaries of sexual behavior; potential outcomes; and women's perception of self with respect to sexual behavior in tourism ."

Latu, I. M. et al. (2013) investigates the measure of empowered behavior in a stressful leadership task. Perceived speech quality was also coded by independent raters and successful female role models inspire women's self-views, but only when the role models are presented as similar to the participants'. According to Saha (2015), the study tries to find whether this scheme is actually able to improve the rate of school attendance of girls and to simultaneously determine whether the number of child marriage has declined or not. Both primary and secondary data have been used for this study. Primary data are collected from various government aided schools and secondary data have been collected from various daily journals, websites etc. After a study, it is evident that this present scheme takes a great role in every regard, regarding social power and self esteem of girls. Altenbuchner, Vogel and Larcher (2017) found in their study that women and men in tribal communities are more equal and women in SC and OBC face more discrimination regarding decision-making patterns, as compared to women in tribal communities .

Kingsberg, S. A. et al. (2017) found in their study that the Women's empowerment survey showed that VVA continues to be an under-recognized and under-treated condition, despite recent educational initiatives and disconnect in education, communication, and information between HCPs and their menopausal patients remains prevalent. Widdersheima & Koizumi (2017) stated that the study examines data from three US public library systems. This study analyzes how private actors communicate with and through public library systems by parsing the signals into components: transmitter, receiver, medium, and message. The resulting signals from two dimensions: the Public Sphere dimension, where private actors govern, legitimate, and use the library, and the Private Sphere dimension, where private actors exchange personal services and exert economic power. A view of public and private signals in interaction reveals how public legitimacy is threatened and how public library systems can mitigate these threats. This study reveals how public/private conflicts in public libraries arise and how they might be resolved.

In the study of Raj, A. et al. (2018) it was found that women's joint control over husband's income and her financial inclusion as indicated by bank ownership appear to reduce risk for IPV, whereas her income generation or control over her own income does not. Halder (2018) found in his study that Honorable Chief Minister of West Bengal in the name of Kanyashree scheme has already started putting marks in the society. Some studies have found that the dropout rate of the girl students is decreasing with each passing year, though there are some other socio-political and economic reasons behind this. It has also been found in some studies that the marriage below the constitutionally scheduled age has also been dropping in ratio every year, though has not been completely wiped out. The children of the age group of 13-18 years have developed the sense of social security in their day to day life as has been observed by teachers and social scientists.

In the study of Colibaba and Skinner (2019), it was found out from interviews and focus groups revealing how the opportunities and challenges associated with older voluntarism (such as participation and wellbeing vs. burden of care and conflict) can inform our understanding of rural ageing in general and the 'contested spaces of rural ageing' in particular. The conceptual and applied implications of researching older voluntarism in ageing rural communities, via social institutions such as libraries, are discussed. Through the above studies, we can conclude that a large amount of research works are being carried out on the empowerment of women and the role and function of public library mechanisms. However, no research has yet found the role of public libraries in the empowerment of women. In that sense the present study is not only unique but also the maiden attempt in South 24 Parganas District of West Bengal where Muslims as well as other marginal groups are the majority of the total population.

Objective of the Study: Before deliberations of the objectives of the present study, let us know the initiatives already taken by the Government of West Bengal.

1. In tier 1, through Kanyashree Prakalpa Annual Scholarship of Rs. 750/- to be paid annually to the girls in the age group 13 to 18 years (studying in Class VIII equivalent or above for every year that they remained in education, provided they are unmarried at the time. In tier 2, they will get a one-time grant of Rs 25,000.00 after attaining the age of 18 only for those who are still in an academic or occupational pursuit and are unmarried. In tier 3, Rs. 2,000.00 is to be given for Post Graduation in Arts and Commerce and Rs. 2,500 for Post Graduation Science Students.
2. The unemployed who are seeking jobs at the age of 18 to 45 years for their skill development training

are provided 1500/- rupees on a monthly basis by the Government project named Yuvashree.

3. In Sabooj Sathi project bi-cycles are provided to students who belong to class 9 to 12 especially girls to reduce the dropout rates.

4. Sikshashree Scholarship is provided as financial assistance to SC/ST students of classes V to VIII for the betterment of their studies and minimizing the dropout rates.

5. Post-Matric Scholarships for SC/ST/Minorities students and Swami Vivekananda Merit-cum-Means Scholarship are provided to the poor and meritorious students on monthly basis. The amount in this regard to UGs for Arts & Commerce is Rs. 1,000 and Rs. 1,500 for Science: Rs. 2,000 for PG Arts & Commerce and Rs. 2,500 for PG Science students: Rs. 5,000 for M.Phil. and Rs. 8,000 for Ph.D. scholars as a financial support by the State Government across the state.

General Objectives

1. To study the present status of women within India in general and West Bengal in specific; and

2. To study the role and functions of public libraries in rural areas of West Bengal.

Specific Objectives

1. To study the overall activities of Kanyashree Prakalpa in Bhangar- I Community Development Block of South 24 Parganas district;

2. To access the effectiveness the Kanyashree one time grant of Rs. 25,000 from 15 socio-economic casual variables such as age of the respondent (X_1), educational status (X_2), financial condition of the family (X_3), housing condition (X_4), involvement towards the society (X_5), association with self help group (X_6), reason behind the association with self help group (X_7), availing bank loan (X_8), reason behind taking the bank loan (X_9), nature and extent of savings (X_{10}), attention towards daughter's education (X_{11}), expenditure towards daughter's education $(X12)$, difficulties towards daughter's education(X_{13}), role of Gram Panchayat in getting Kanyashree grant (X_{14}) and ROLE of Block Development Office in getting public services (X_{15});

3. To study the effectiveness of Kanyashree one time grant towards women empowerment;

4. To evaluate the perceptional level of parents on women empowerment from 22 consequent variables like age of the respondent (X_1), educational status (X_2), financial condition of the family $(X3)$, housing condition (X_4), involvement towards the society (X_5), association with self help group (X_6), reason behind the association with self help group (X_7), availing bank loan (X_8), reason behind taking the bank loan (X_9), nature and extent of savings (X_{10}), attention towards daughter's education (X_{11}), expenditure towards daughter's education (X_{12}), difficulties towards daughter's education(X_{13}), role of Gram Panchayat in getting Kanyashree grant (X_{14}), role of Block Development Office in getting public services (X_{15}), Effectiveness of Kanyashree grant (X_{16}), Use

of Kanyashree scholarship grant towards education (X_{17}), wages towards women empowerment (X_{18}), encouragement towards women empowerment (X_{19}), social taboo towards women empowerment (X_{20}), role of public libraries towards women empowerment (X_{25}) and activities of public libraries (X_{27});

5. To assess the role of public libraries in empowering women; and

6. To find the relationship between the role of public libraries and 15 others independent variables such as effectiveness of Kanyashree grant (X_{16}), use of Kanyashree scholarship grant towards education (X_{17}), wages towards women empowerment (X_{18}), encouragement towards women empowerment (X_{19}), social taboo towards women empowerment (X_{20}), assess the level of women empowerment (X_{21}), availability of public library (X_{22}), association with rural public library (X_{23}), level of association with rural library (X_{24}), role of public libraries towards women empowerment (X_{25}), available services of rural library (X_{26}), activities of public libraries (X_{27}), expected services of rural library (X_{28}), up-gradation of public library (X_{29}) and suggestion towards development public library (X_{30}).

METHODS

Study Setting: For the improvement in the status of living of girls and women in West Bengal in order to reduce the girls' dropout, prevent child marriage and to increase the educational attainment of girls till the age of at least 18, Kanyashree programme has been adopted by provincial government of West Bengal. West Bengal Government has launched Kanyashree Prakalpa scheme since 2013 in order to improve the status of girls and women especially in rural areas of West Bengal by reducing girls' dropout rates as well as preventing child marriage, child trafficking, and increase in educational attainment of a girl child.

The scheme aims at improving the status and well being of a girl child by:

1. Discouraging early marriage of girls to ensure compliance with the legal provisions pertaining to the minimum age of marriage.

2. Incentivize through scholarships, the continuation of education of the girl child in Secondary and Higher Secondary classes and those undergoing vocational training or sports training.

3. Improving IMR(Infant Mortality Rate) and MMR(Maternal Mortality Ratio) by delaying the age of marriage and consequently increasing the median age of first birth.

4. Reducing the incidence of drop outs, especially amongst girls from poor families.

5. Eradicating under nutrition and mal-nutrition of girl child.

6. Preventing trafficking and exploitation of the girl child.

Disseminating information to the society is one of the most important roles of public libraries across the world.

Yet public libraries in India have limited their functions only in collecting, organizing, lending and issuing various books, journals, magazines, periodicals and newspapers among the society. Our study focuses on the level of functioning of public libraries in disseminating information to the women for their empowerment.

Study Design: The primary data were collected from parents of girl children who received the benefit of Kanyashree one time scholarship grant of Rs. 25,000 in Bhangar- I block of South 24 Parganas district in West Bengal. The survey was conducted in the time span of February 2019 to March 2019. The overall objective of this survey is to understand the level of involvement of public libraries in the rural areas of the state of West Bengal towards disseminating information among the female students especially those who are getting scholarship of one-time grant Rs. 25000 at the end of 18 years of age.

According to the 2011 Census of India, the Bhangar I CD block had a total population of 249,170, of which 228,528 were rural and 20,642 were urban. There were 127,702 (51%) males and 121,465 (49%) females. There were 35,693 persons in the age range of 0 to 6 years. The Scheduled Castes numbered 52,312 (20.99%) and the Scheduled Tribes numbered 3,133 (1.26%) and According to the 2011 census, the total number of literate persons in the Bhangar I CD block was 153,835 (72.06% of the population over 6 years) out of which males numbered 84,390 (77.03% of the male population over 6 years) and females numbered 69,445 (66.83% of the female population over 6 years). The gender disparity (the difference between female and male literacy rates) was 10.20% . There are 99 primary schools, 3 high schools, 14 higher secondary schools and 1 general degree college named Bhangar Mahavidyalaya situated in Bhangar I Community Development block. Through random sampling method, we chose 14 students from Higher Secondary Schools and from one College, 100 girls student have been identified.

Measures
Outcomes: Outcomes of the present analysis are of three folders. In the first phase analysis includes the effectiveness of Kanyashree one time grant (Y), age of the respondent (X1), educational status (X2), financial condition of the family (X3), housing condition (X4), involvement towards the society (X5), association with self help group (X6), reason behind the association with self help group (X7), availing bank loan (X8), reason behind taking the bank loan (X9), nature and extent of savings (X10), attention towards daughter's education (X11), expenditure towards daughter's education (X12), difficulties towards daughter's education(X13), role of Gram Panchayat in getting Kanyashree grant (X14) and role of Block Development Office in getting public services (X15).

In the second phase, study has been conducted to assess the perception level of parents on women empowerment (Z) from 22 causal factors like age of

the respondent (X1), educational status (X2), financial condition of the family (X3), housing condition (X4), involvement towards the society (X5), association with self help group (X6), reason behind the association with self help group (X7), availing bank loan (X8), reason behind taking the bank loan (X9), nature and extent of savings (X10), attention towards daughter's education (X11), expenditure towards daughter's education (X12), difficulties towards daughter's education(X13), role of Gram Panchayat in getting Kanyashree grant (X14) and role of Block Development Office in getting public services (X15), effectiveness of Kanyashree grant (X16), use of Kanyashree scholarship grant towards education (X17), wages towards women empowerment (X18), encouragement towards women empowerment (X19), social taboo towards women empowerment (X20), role of public libraries towards women empowerment (X25) and activities of public libraries (X27).

In the third phase, data has been collected in order to evaluate the role of public libraries towards women empowerment (W) from 15 consequent variables such as effectiveness of Kanyashree grant (X16), use of Kanyashree scholarship grant towards education (X17), wages towards women empowerment (X18), encouragement towards women empowerment (X19), social taboo towards women empowerment (X20), assess the level of women empowerment (X21), availability of public library (X22), association with rural public library (X23), level of association with rural library (X24), role of public libraries towards women empowerment (X25), available services of rural library (X26), activities of public libraries (X27), expected services of rural library (X28), up-gradation of public library (X29) and suggestion towards development public library (X30).

Independent Variable: For this study, we identified three sets of independent variables. In the first phase, apart from socioeconomic and personal factors, the roles of Gram Panchayat and Block Development Office are considered as independent variables. In the second phase, socioeconomic and personal variables, like the role of local autonomy, the effectiveness of the Kanyashree scholarship, issues related to women's empowerment, and public library participation in women's empowerment has been considered as independent variables. In the third phase, the effectiveness of Kanyashree's one-time grants, factors affecting women's empowerment and the operation of public libraries were considered as independent variables.

Analysis: Using correlation and multiple regression models, we evaluated the relationship between the parents' of the recipients of Kanyashree Scheme on effectiveness of Kanyashree's one-time grants from different socio-economic and personal variables.

Table-I depicts the parents perception on the effectiveness of Kanyashree one time grant (Y) from 15 independent variables such as age of the respondent (X1), educational status (X2), financial condition of the family (X3), housing condition (X4), involvement towards the

society (X5), association with self help group (X6), reason behind the association with self help group (X7), availing bank loan (X8), reason behind taking the bank loan (X9), nature and extent of savings (X10), attention towards daughter's education (X11), expenditure towards daughter's education (X12), difficulties towards daughter's education(X13), role of Gram Panchayat in getting Kanyashree grant (X14) and role of Block Development Office in getting public services (X15). From the table of correlation coefficient, it has been found that educational status (X2), financial condition of the family (X3), housing condition (X4), involvement towards the society (X5), attention towards daughter's education (X11) and expenditure towards daughter's education (X12) had strong positive bearing on the level of perception about the effectiveness of Kanyashree one time grant towards the empowerment of women.

Table 1. Correlation Analysis between dependent variable effectiveness of Kanyashree one time grant (Y) and 15 casual variables

Variables	'r' Value
Age of the respondent (X1)	-0.0223
Educational status (X2)	0.3594**
Financial condition of the family (X3)	0.3869**
Housing condition (X4)	0.2999**
Involvement towards the society (X5)	0.7854**
Association with Self Help Group (X6)	-0.6840**
Reason behind the association with Self Help Group (X7)	-0.3731**
Availing bank loan (X8)	-0.4423**
Reason behind taking the bank loan (X9)	-0.3206**
Nature and extent of savings (X10)	-0.4423**
Attention towards daughter's education (X11)	0.6276**
Expenditure towards daughter's education (X12)	0.4121**
Difficulties towards daughter's education(X13)	-0.6575**
Role of Gram Panchayat in getting Kanyashree grant (X14)	-0.0308
Role of Block Development Office in getting public services (X15)	0.1329
Critical value (2-Tail, 0.05) = +or- 0.197	*Significant at 5% level
Critical value (2-Tail, 0.01) = +or- 0.256	** Significant at 1% level

The variables such as association with Self Help Group (X6), reason behind the association with Self Help Group (X7), availing bank loan (X8), reason behind taking the bank loan (X9), nature and extent of savings (X10) and difficulties towards daughter's education(X13) had strong negative bearing on the level of perception about the effectiveness of Kanyashree one time grant towards the women empowerment.

Table 2. Multiple Regression Analysis

Variables	"β" value	"t" value
Age of the respondent (X1)	0.036712	0.594
Educational status (X2)	0.070856	0.964
Financial condition of the family (X3)	-0.071639	-0.840
Housing condition (X4)	0.921561	6.251
Involvement towards the society (X5)	0.108385	1.483
Reason behind the association with Self Help Group (X7)	-0.754553	-3.002
Nature and extent of savings (X10)	0.834180	3.290
Expenditure towards daughter's education (X12)	-0.059113	-0.666
Difficulties towards daughter's education(X13)	-0.058934	-0.296
Role of Gram Panchayat in getting Kanyashree grant (X14)	-0.024985	-0.405
Role of Block Development Office in getting public services (X15)	-0.006252	-0.094
Critical value (2-Tail, 0.05) = +or- 1.989	Significant at 5% level	
Critical value (2-Tail, 0.01) = +or- 2.636	Significant at 1% level	

Multiple R	= 0.82467
R Square	= 0.68008
Adjusted R Square	= 0.64009
Standard Error	= 0.53251

Analysis of Variance

DF	Sum of Squares	Mean Square
Regression	11	53.04598	4.82236
Residual	88	24.95402	0.28357
F = 17.00599	Signif F = .0000	

Table II presents the multiple regression analysis with β values and corresponding t values. It is discernible that the variables like age of the respondent (X1), educational status (X2), financial condition of the family (X3), housing condition (X4), involvement towards the society (X5), reason behind the association with self help group (X7), nature and extent of savings (X10), expenditure towards daughter's education (X12), difficulties towards daughter's education(X13), role of Gram Panchayat in getting Kanyashree grant (X14) and role of Block Development Office in getting public services (X15) have been found to exercise significant regressional effect on the level of effectiveness of Kanyashree one time grant. It has been found that there are different factors affecting the level of effectiveness of Kanyashree one time grant. It is also to be mentioned that all fifteen variables put together can explain 68.00 per cent (R2 = 0.68008) of the total effect. This

demands inclusion of more variables as well as more number of respondents for being studied across

the heterogeneous micro situations to generate higher levels of explicability.

Table 3. Step-down Regression Model	
Step I: X4	
Multiple R	= 0.78537
R Square	= 0.61680
Adjusted R Square	= 0.61289
Standard Error	= 0.55226

In the step down regression model it has been found that after 1st step, 1 variable named housing condition (X4) can explain 61.68 per cent of the total effect. Here, the 1 variable can explain 61.68 per cent regressional effect on the level of effectiveness on Kanyashree one time grant in comparison to the total estimated value of 68.00 per cent.

Table 4. Correlation Analysis between dependent variable the perception level of parents on women empowerment (Z) and 22 casual variables	
Variables	**'r' Value**
Age of the respondent (X1)	0.0050
Educational status (X2)	0.3427**
Financial condition of the family (X3)	0.3257**
Housing condition (X4)	0.6589**
Involvement towards the society (X5)	0.3001**
Association with Self Help Group (X6)	-0.6304**
Reason behind the association with Self Help Group (X7)	-0.4027**
Availing bank loan (X8)	-0.4959**
Reason behind taking the bank loan (X9)	-0.4021**
Nature and extent of savings (X10)	-0.4959**
Attention towards daughter's education (X11)	0.6236**
Expenditure towards daughter's education (X12)	0.3861**
Difficulties towards daughter's education(X13)	-0.6304**
Role of Gram Panchayat in getting Kanyashree grant (X14)	-0.1326
Role of Block Development Office in getting public services (X15)	-0.0422
Effectiveness of Kanyashree grant (X16)	0.5936**
Use of Kanyashree scholarship grant towards education (X17)	-0.1917
Wages towards women empowerment (X18)	-0.1498
Encouragement towards women empowerment (X19)	-0.0290
Social taboo towards women empowerment (X20)	0.0792
Role of public libraries towards women empowerment (X25)	0.1759
Activities of public libraries (X27)	0.0390

Critical value (2-Tail, 0.05) = +or- 0.197 *Significant at 5% level
Critical value (2-Tail, 0.01) = +or- 0.256 ** Significant at 1% level

Table IV depicts the perception level of parents on women empowerment (Z) from 22 causal factors like age of the respondent (X1), educational status (X2), financial condition of the family (X3), housing condition (X4), involvement towards the society (X5), association with self help group (X6), reason behind the association with self help group (X7), availing bank loan (X8), reason behind taking the bank loan (X9), nature and extent of savings (X10), attention towards daughter's education (X11), expenditure towards daughter's education (X12), difficulties towards daughter's education(X13), role of Gram Panchayat in getting Kanyashree grant (X14) and role of Block Development Office in getting public services (X15), Effectiveness of Kanyashree grant (X16), Use of Kanyashree scholarship grant towards education

(X17), wages towards women empowerment (X18), encouragement towards women empowerment (X19), social taboo towards women empowerment (X20), role of public libraries towards women empowerment (X25) and activities of public libraries (X27).

From the table of correlation coefficient, it has been found that educational status (X2), financial condition of the family (X3), housing condition (X4), involvement towards the society (X5), attention towards daughter's education (X11), expenditure towards daughter's education (X12) and effectiveness of Kanyashree grant (X16) had strong positive impact on the level of perception about the empowerment of women. And the variables like association with Self Help Group (X6),

reason behind the association with Self Help Group (X7), availing bank loan (X8), reason behind taking the bank loan (X9), nature and extent of savings (X10) and

difficulties towards daughter's education(X13) had strong negative bearing on the level of perception about the empowerment of women.

Table 5. Multiple Regression Analysis		
Variables	"β" value	"t" value
Age of the respondent (X1)	0.089238	1.211
Educational status (X2)	0.075667	0.866
Financial condition of the family (X3)	0.030876	0.260
Housing condition (X4)	0.392061	1.995*
Involvement towards the society (X5)	0.255002	2.865**
Reason behind the association with Self Help Group (X7)	0.288579	0.851
Reason behind taking the bank loan (X9)	-0.260677	-0.826
Expenditure towards daughter's education (X12)	-0.026606	-0.254
Difficulties towards daughter's education(X13)	-0.231581	-0.984
Role of Gram Panchayat in getting Kanyashree grant (X14)	-0.114550	-1.552
Role of Block Development Office in getting public services (X15)	-0.206995	-2.647**
Effectiveness of Kanyashree grant (X16)	0.169371	1.309
Use of Kanyashree scholarship grant towards education (X17)	0.251590	2.303*
Wages towards women empowerment (X18)	-0.101548	-1.010
Encouragement towards women empowerment (X19)	0.159316	1.468
Social taboo towards women empowerment (X20)	0.162442	2.009*
Role of public libraries towards women empowerment (X25)	0.061208	0.821
Activities of public libraries (X27)	-0.001477	-0.020

Critical value (2-Tail, 0.05) = +or- 1.991 * Significant at 5% level
Critical value (2-Tail, 0.01) = +or- 2.641 ** Significant at 1% level

Multiple R	=0.77847
R Square	= 0.60602
Adjusted R Square	= 0.51847
Standard Error	=0.52949

Analysis of Variance
DF	Sum of Squares	Mean Square
Regression	18	34.93099	1.94061
Residual	81	22.70901	.28036
F = 6.92190	Signif F = .0000	

Table V presents the multiple regression analysis with β values and corresponding t values. It is discernible that the variables like age of the respondent (X1), educational status (X2), financial condition of the family (X3), housing condition (X4), involvement towards the society (X5), reason behind the association with self help group (X7), reason behind taking the bank loan (X9), expenditure towards daughter's education (X12), difficulties towards daughter's education(X13), role of Gram Panchayat in getting Kanyashree grant (X14) and role of Block Development Office in getting public services (X15), effectiveness of Kanyashree grant (X16), use of Kanyashree scholarship grant towards education (X17), wages towards women empowerment (X18), encouragement towards women empowerment (X19), social taboo towards women empowerment (X20), role of public libraries towards women empowerment (X25) and activities of public libraries (X27) have been found to exercise significant regressional effect on to assess the perception level of parents on women empowerment. It has been found that the different factors affecting the level of women empowerment. It is also to be mentioned that all twenty two variables put together can explain 60.60 per cent (R2 = 0.60602) of the total effect.

After the step down regression analysis model is applied to segregate the prominent independent variables it has been found that after step 2, the 2 variables

Table 6. Step-down Regression Model

Step I: X4	
Multiple R	= 0.65894
R Square	= 0.43421
Adjusted R Square	= 0.42843
Standard Error	= 0.57687
Step II: X13	
Multiple R	= 0.68445
R Square	= 0.46847
Adjusted R Square	= 0.45751
Standard Error	= 0.56200

namely, Housing condition (X4) and difficulties towards daughter's education(X13) can together explain 46.84 per cent of the total estimated effect 60.60 per cent. With the help of bivariate correlation and multiple regression analysis, we will try to evaluate the role of public libraries in the designated socio-economic field. Here the role of local autonomy, the effectiveness of Kanyashree's one-time grants, the relationship between the issues related to empowerment and participation of women, the function of public libraries empowering women are considered as independent variable.

Table 7. Correlation Analysis between dependent variable role of public libraries towards women empowerment (W) and 15 casual variables

Variables	'r' Value
Effectiveness of Kanyashree grant (X16)	0.0944
Use of Kanyashree scholarship grant towards education (X17)	-0.1320
Wages towards women empowerment (X18)	-0.1683
Encouragement towards women empowerment (X19)	-0.0697
Social taboo towards women empowerment (X20)	0.0402
Assess the level of women empowerment (X21)	0.0024
Availability of public library (X22)	0.4146**
Association with rural public library (X23)	0.7012**
Level of association with rural library (X24)	-0.1583
Role of public libraries towards women empowerment (X25)	0.5064**
Available services of rural library (X26)	0.7712**
Activities of public libraries (X27)	0.3161**
Expected services of rural library (X28)	-0.0108
Up-gradation of public library (X29)	0.3422**
Suggestion towards development public library (X30)	0.5038**

Critical value (2-Tail, 0.05) = +or- 0.197 *Significant at 5% level
Critical value (2-Tail, 0.01) = +or- 0.256 ** Significant at 1% level

Table 8. Multiple Regression Analysis

Variables	"β" value	"t" value
Effectiveness of Kanyashree grant (X16)	-0.014417	-0.189
Use of Kanyashree scholarship grant towards education (X17)	0.013738	0.200
Wages towards women empowerment (X18)	-0.180973	-2.268*
Encouragement towards women empowerment (X19)	0.016269	0.196
Social taboo towards women empowerment (X20)	-0.031276	-0.490
Assess the level of women empowerment (X21)	-0.092222	-1.279
Availability of public library (X22)	0.007980	0.118
Association with rural public library (X23)	0.248848	2.721**
Level of association with rural library (X24)	-0.071898	-1.247
Role of public libraries towards women empowerment (X25)	-0.101496	-1.234
Available services of rural library (X26)	0.534218	6.411**
Activities of public libraries (X27)	0.179513	2.995**
Expected services of rural library (X28)	-0.008407	-0.136
Up-gradation of public library (X29)	0.111137	1.689
Suggestion towards development public library (X30)0.163836	2.184*	

Critical value (2-Tail, 0.05) = +or- 1.989 *Significant at 5% level
Critical value (2-Tail, 0.01) = +or- 2.636 ** Significant at 1% level

Multiple R	= 0.86707
R Square	= 0.75182
Adjusted R Square	= 0.70750
Standard Error	= 0.35210

Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	15	31.54631	2.10309
Residual	84	10.41369	0.12397
F =	16.96415	Signif F =	.0000

Table 9. Step-down Regression Model

Step I: X26	
Multiple R	= 0.77115
R Square	= 0.59467
Adjusted R Square	= 0.59054
Standard Error	= 0.41659
Step II: X23	
Multiple R	= 0.80741
R Square	= 0.65192
Adjusted R Square	= 0.64474
Standard Error	= 0.38804
Step III: X27	
Multiple R	= 0.82928
R Square	= 0.68770
Adjusted R Square	= 0.67794
Standard Error	= 0.36946
Step IV: X18	
Multiple R	= 0.84072
R Square	= 0.70681
Adjusted R Square	= 0.69446
Standard Error	= 0.35986
Step V: X30	
Multiple R	= 0.85120
R Square	= 0.72455
Adjusted R Square	= 0.70989
Standard Error	= 0.35065

Table VII depicts the parents perception on to evaluate the role of public libraries towards women empowerment (W) from 15 consequent variables such as effectiveness of Kanyashree grant (X16), use of Kanyashree scholarship grant towards education (X17), wages towards women empowerment (X18), Encouragement towards women empowerment (X19), social taboo towards women empowerment (X20), assess the level of women empowerment (X21), availability of public library (X22), association with rural public library (X23), level of association with rural library (X24), role of public libraries towards women empowerment (X25), available services of rural library (X26), activities of public libraries (X27), expected services of rural library (X28), up-gradation of public library (X29) and suggestion towards

development public library (X30). From the table of correlation coefficient, it has been found that Availability of public library (X22), association with rural public library (X23), role of public libraries towards women empowerment (X25), available services of rural library (X26), activities of public libraries (X27), up-gradation of public library (X29) and suggestion towards development public library (X30) had strong positive bearing on the level of perception of parents to evaluate the functions of public libraries towards women empowerment.

Table-VIII presents the multiple regression analysis with β values and corresponding t values. It is discernible that the variables like effectiveness of Kanyashree grant (X16), use of Kanyashree scholarship grant towards education (X17), wages towards women empowerment (X18), encouragement towards women empowerment (X19), social taboo towards women empowerment (X20), assess the level of women empowerment (X21), availability of public library (X22), association with rural public library (X23), level of association with rural library (X24), role of public libraries towards women empowerment (X25), available services of rural library (X26), activities of public libraries (X27), expected services of rural library (X28), up-gradation of public library (X29) and suggestion towards development public library (X30) have been found to exercise significant regressional effect on to evaluate the level role of public libraries towards women empowerment. It has been found that there are different factors affecting the level of women empowerment through public libraries. It is also to be mentioned that all fifteen variables put together can explain 75.18 per cent (R^2 = 0.75182) of the total effect.

After applying the step down regression process, it has been found that only 5 variables namely, available services of rural library (X26), association with rural public library (X23), activities of public libraries (X27), wages towards women empowerment (X18) and suggestion towards development public library (X30) can explain 72.45 per cent of the total regressional effect. With the help of bivariate correlation and multiple regression analysis, we evaluated the correlation between the role of public libraries and socio-economic and personal variables, the effectiveness of Kanyashree's one-time grants, related to empowering women and the functions of public libraries' factors play as independent variables.

RESULTS AND DISCUSSION

When measuring the perceived level of guardians of female students who have received Kanyashree's one-time grant of Rs. 25,000 upon arrival of the age of 18, we found that educational status of the parents had a strong positive impact on the level of perception which indicates that if educational qualification of the parents is increased, the level of perception also increases. Not only that, financial condition of the family, housing condition and involvement towards the society also indicate a strong positive bearing on

the level of perception. Expenditure towards daughter's education has tremendous positive effect on Kanyashree one time grant. The variable named difficulties towards daughter's education has negative impact on the level of perception of Kanyashree one time grant. And the Role of Block Development Office in getting public services executed also had a strong positive bearing on the level of perception of getting Kanyashree one time grant.

In the 2011 Census of India, Muslim communities formed 67.38% of the population in the Bhangar I CD block compared to other religions. The analysis shows that the parents faced huge problems towards their daughters' education. That is why Government of West Bengal launched the programme named Kanyashree Prakalpa. The aim of this project is that, every girl-child within the age group of 13 to 18 years up to class VIII onwards will be getting Rs. 750 per year and after completion of 18 years the unmarried girl-child will also get Rs. 25000 as one time Kanyashree grant. This one-time grant of Rs. 25000 is very essential for a good number of daughters who have been forced to marry at the age of 18 years. According to the Human Development Report for South 24 Parganas district published in 2009, in the Bhangar I CD block the percentage of households below poverty line was 28.22%, a moderate level of poverty.

Therefore Kanyashree one time grant of Rs. 25,000 has played a great role as financial support for their daughters' education. Significantly, the rate of early child marriage has been reduced substantially with the help of this grant. In 2007-08, the early child marriage rate of South 24 Parganas District was 39.9 per cent (DLHS-3) whereas in 2012-2013 the early child marriage rate in South 24 Parganas District was 29.1 per cent (DLHS – 4). After getting Kanyashree grant, one can start a small enterprise with the help of Rs. 25000. In this case, the implementation of Kanyashree Prakalpa played a great role for empowering women. In present scenario the Kanyashree annual scholarship grants are given to all girl students from class 8 up to post graduation level. For school level, a girl student will get Rs 750 per annum and at the age of 18 years, she will get a one-time scholarship grant of Rs. 25,000 and for University level, Rs. 2,000 is given to the female students of Arts and Commerce Stream and Rs. 2,500 for female students of Science Stream, and the scholarship amount is directly deposited to their bank account.

Therefore, Kanyashree Prakalpa has carried out various activities to reduce poverty, improve their good health, narrow the gender equality gap, strengthen quality education, promote economic growth, promote sustainable development and promote innovation, reduce school dropout rates at all levels, reduce child trafficking and in promoting peaceful and inclusive societies. It is difficult to obtain the level of parental awareness regarding women's empowerment from 22 consequent variables. This study shows that where the family's economic situation is relatively better, parents' perception level is more important. The variable named difficulty towards daughter's education has a negative impact on

the level of perception of women empowerment. And the role of Gram Panchayat in getting Kanyashree grant had strong negative bearing on the level of parental perception towards women empowerment.

Public library is one of the most important information centers for empowering women. The study obtained the level of parental awareness as a role of public libraries in accessing information on women's empowerment from 15 corresponding variables. It is revealed that availability of public library, association with rural public library, role of public libraries towards women empowerment, available services of rural library, activities of public libraries, up-gradation of public library and suggestion towards development public library have shown their strong positive impact on the perception level of parents as a role of public libraries in getting information towards women empowerment.

In Bhangar- I CD Block, public libraries assume responsibility of disseminating knowledge, providing additional information, and expanding various external activities. Due to lack of proper staffing, a librarian in any public library has to assume the additional responsibility of at least two to three adjacent public libraries. As a result, public libraries are often unable to establish connection with rural people and to obtain the desired level of empowerment of women. However, this study shows that public librarians at public libraries provide the best service using available resources. Time has changed. The digitization of public libraries and the availability of the internet reduced the tedious hours of work, but also provide parents and daughters with the necessary information to empower women.

Special Evidences in Bhangar– I C.D Block

- We got special evidences from the undertaken areas which are mentioned below.
- In Bhangar- I C.D Block Khadija Khatun purchased sewing machine from the Kanyashree one-time grant in 2018.
- Purabi Chatterjee took a short time nursing training course with the help of Kanyashree one-time grant in 2019.
- Saheli Sultana's father gave a second hand bike as dowry for his daughter's marriage from the Kanyashree onetime grant in 2018.
- Ruksana Sultana purchased a bangle of gold for her marriage purpose in 2016 from Kanyashree onetime grant.
- Rimpi Tammana brought a mobile phone for communication purpose.
- Some students as for example Mandira ghosh, Baisakhi Chatterjee etc. who got Kanyashree onetime grant. After school level they took admission in Bhangar College with the help of this grant.
- Some students helped to develop their fathers' business with this amount.
- The Head Master of Tandra High School stopped the marriage of a few students under 18 years. They were: Chandrani Saha (17 years), Rittika Mondal (17 years) and Puja Mondal (16 years) with the help of

Bhangar- I Block Development Officer (B.D.O) and local administration.

- At the end of March, 2018 the Head master of Narayanpur High School (Old Site) stopped the marriage of a female student who read in this institution with the help of local administration and B.D.O.
- Some students Reshma, Suhana, Sultana etc. got married before 18 years but received Kanyashree one-time grant without showing their marriage proof.

Table X shows that from 100 parents of the students spend their money from their family income on daughters' education in the following manners.

List of students who got married below 18 years in Bhangar- I Block.			
Sl. No.	Name of the student	Fathers name	Age
01.	Bilkis Khatun	Kousar Molla	16
02.	Aspia Khatun	Zolmot Sardar	16
03.	Nargis Parvin	Late. Md. Sukur Ali	13
04.	Anawara Mondal	Emdadul mondal	14
05.	Sufia	Abbas Molla	16
06.	Asma Khatun	Malek Khan	16

Table 10. Parents' expenditures according to their preferences								
Priorities of expenditure	1st	2nd	3rd	4th	5th	6th	7th	8th
Daughter's education	56	33	10				1	
Son's education	17	41	25	2	4	4		7
Investment of Agriculture/ Business	6	12	39	29	12	1	1	
Treatment of family	2	8	12	29	23	21	3	2
Construction of sanitation facilities and maintenance of houses			4	15	28	40	13	
Savings			2	5	7	10	66	10
Marriage of daughter	19	18	36	11	8	6	2	
Others						8	13	79

Table 11. Desired societal changes according to parents				
Priorities	1st	2nd	3rd	4th
Eradication of illiteracy		33		
Child labour or school dropouts			18	
Violence against women	37			
Child marriage				12

56 per cent have their 1st preference; accordingly 33 per cent, 10 per cent and 1 per cent have their 2nd, 3rd and 7th choice. And expenditure towards Son's education 17 per cent, 41 per cent, 25 per cent, 2 per cent, 4 per cent, 4 per cent and 7 per cent have their 1st, 2nd, 3rd, 4th, 5th, 6th and 8th preference. In the purpose of investment towards agriculture and business the parents spend their money 6 per cent, 12 per cent, 39 per cent, 29 per cent, 12 per cent, 1 per cent and 1 per cent have their 1st, 2nd, 3rd, 4th, 5th, 6th and 7th preference accordingly. They spend their money in family Treatment, which are 2 per cent, 8 per cent, 12 per cent, 29 per cent, 23 per cent, 21 per cent, 3 per cent and 2 per cent have their 1st, 2nd, 3rd, 4th, 5th, 6th, 7th and 8th preferences accordingly.

Here 4 per cent, 15 per cent, 28 per cent, 40 per cent and 13 per cent respondents use their income in the cases of construction of sanitation facilities and maintenance of

houses having 1st, 2nd, 3rd, 4th, 5th, 6th, 7th preferences accordingly. 2 per cent, 5 per cent, 7 per cent, 10 per cent, 66 per cent and 10 per cent parents keep their income aside for saving purposes takes 3rd, 4th, 5th, 6th, 7th and 8th preferences accordingly. The parents who spend the money in daughters marriage from their income are 19 per cent, 18 per cent,36 per cent, 11 per cent, 8 per cent, 6 per cent and 2 per cent having 1st, 2nd, 3rd, 4th, 5th, 6th, 7th preferences respectively. Some of the parents manage to spend their income for other purposes like buying house hold goods, ornaments and other limited purposes which are 8 per cent, 13 per cent and 79 per cent have their 6th, 7th and 8th preferences accordingly.

Table 12. Perception regarding women empowerment				
Priorities	1st	2nd	3rd	4th
Financial empowerment	49			
Decision making within the family			18	
Societal decision making		27		
Decision making in local administrative matters				6

Table XI explains that among the 100 interviewees, 37 per cent respondents prefer to go with the 1st priority,

Violence against women; 33 per cent parents would like the changes over the eradication of illiteracy at their village; 18 per cent parents have their priorities for changes over Child labour or school dropout rates; lastly 12 per cent among them prioritize to make changes in child marriage rates at their surroundings. Table XII describes that questions asked to 100 respondents about their point of view regarding women empowerment, 49 per cent of them agreed to go with the 1st priority that is financial empowerment; 27 per cent of them prefer to go with the 2nd priorities that is Societal decision making; 18 per cent of them would like to stay on the 3rd priorities which is decision making within the family matters; lastly 6 per cent among them having 4th priorities in decision making in local administrative matters.

CONCLUSION

This study was considered as parents' opinion on women empowerment through public libraries in Bhangar- I Community Development Block of South 24 Parganas District, West Bengal. Here, the research was conducted on how the recipients of a one-time grant of Rs. 25,000 from Kanyashree benefited using it as a start-up fund for a small business to build financial capacity. Here, the public libraries have a great role for empowering the women through different types of activities like disseminating information to the users, through different types of cultural activities, displaying the newly arrived books, book exhibitions etc. If any girl child faced any problem regarding receiving this Kanyashree grant, public libraries solved the problem giving the proper information so that they could get the Kanyashree grant easily. But the public libraries are so poorly understaffed that sometimes users are not satisfied from the services given by them. According to Sidney Sheldon, "Libraries store the energy that fuels the imagination. They open up windows to the world and inspire us to explore and achieve, and contribute to improving our quality of life".

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Excitation of Alkali Metal Atoms by Electron-Impact

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ABSTRACT

The better improve of the basic underlying processes and understanding to provide simple methods of calculating the reasonable estimates of the cross section we require relevant data. somewhat estimated theoretical and experimental the results are found to be in better agreement with experimental results than those of the Combined Classical theory and firs Born approximation. Zapesochnyl et al (1975) carried out many effective cross sections for excitation of the resonance levels of alkali metal atoms by electrons impact with energies ranging from threshold up to 300 eV. These result come between the First Born approximation calculations and the observed experimental result.

KEY WORDS: IONIZATION CROSS SECTION, INELASTIC COLLISION, SCATTERED WAVES, ARBITRARY ATOM, PYROLYTIC GRAPHITE, QUANTUM APPROXIMATION.

INTRODUCTION

An improved technique for studying ionization in cross section atomic and mono energetic electron beams is explained. The ionization cross sections are measured for all alkali metals at electron energies from threshold to 30 eV. There is an increased discrepancy between the calculated and experimental cross sections when distortions of the incoming and scattered waves are taken into account. The electron impact excitation of alkali metal atoms is important in the study of plasma and gaseous state. A little information is available for excitation to higher states. Tate and Smith et al (1934) who first measured the ionization function of Na, K, Ru and Cs using metal vapour variation in volume process. The ionization of all the alkali metal atoms have been obtained. The ionization of alkali metal atoms by electron impact has been investigated. In the present work we have chosen the New model.Va1nshte1n et al (1964).

Born approximation with close coupling for the calculation of the excitation to first excited level are in good agreement with experimental and other theoretical data, the result for the excitation up to the close few level are satisfactory. Roy et al (1973) worked on Classical Binary Encounter methods for calculation using a new Hartree Fock velocity distribution to the bound electrons have been carried out several times for electron impact and ionization of all alkali metals atoms. More close effective of ionization as well as the excitation of some autonization levels also considered. The Born approximation within cross sections for inelastic collisions framework of Conventional Perturbation theory with a separation of variables were found not much useful. Oleg Zatsarinny et al (2014) Large scale R matrix with pseudo states calculation for electron collision with Argon atom calculated with the use of recently developed parallel version and B-Spline R-Matrix code were reported.

Lomsadze et al (2013) have worked on total cross sections for charge ions, ionization, and excitation in K+-He collisions which were measured in the ionic energy range from 0.7 to 10 KeV. Bajales et al (2008) they reported on measurements of electron emission spectra from surfaces of highly oriented pyrolytic excited states energy range varies from1 to 5 ke Johann.V. Pototschnig et al (2017) in his new work defined and explained vibrational analysis to electronically excited states in the alkali metals such as Li, Na, K and Rb.

DISCUSSION

The undefined structure observed in the Cs, Ru and K ionization curves can be accounted consistently by p level cell excitation for the alkali metal atoms. korchevoiet al (1966) The effective cross sections for resonance excitation of Rubidium atoms up to the 5p level, Rubidium atoms and potassium atom up to 4p levels are measured in the pre thresholds electronic energy rang with help of trapped electron method. The effective ionization cross sections for Cs, Rb, and K atoms are measured in the pre-threshold electron energy range. Miraglia et al (2008) In this paper they report ionization cross sections of positive Li^+, Na^+, K^+ and Rb^+ and for neutral atoms are energy range from 25 to 1000 KeV for He, Ne, Ar, Kr and Xe atoms.

Theory and Formulae: The entire discussion pertains to the hydrogen atom, with the complete wave function of the system presentation by expression

$$\Psi = \varphi(\mathbf{r_1}) g(\mathbf{r_1}, \mathbf{r_2}), \tag{1}$$

where is the unperturbed wave function of the atomic state electron and g(r1,r2) describes the mutual scattering of the mutual and optical external electrons with their centre of mass on the nucleus. It was found useful to introduce the effective velocity dependant charge. The function g satisfies the equation.

$$S=ko/(ko+1eol), P=(\mathbf{r_2}-\mathbf{r_1}), R=-(r2+\mathbf{r_1}), \tag{2}$$

where e_o is the energy of atomic state and ko is the the momentum of incident electron.Rydberg energy units and atomic units are used it may be expressed as

$$\left[\frac{1}{2}\Delta_R + \frac{1}{2}\Delta_\rho + \frac{\zeta}{R} - \frac{\zeta}{\rho} + k_0^2\right]g = 0, \tag{3}$$

The method may be applied directly and indirectly for an atom which is based on electron approximation, it is assume that the optical electron moves in the field of the atomic core, which is not changed when the optical electron under goes transitions. As previously, g is represented by (2)in the term t/R we would have to take into account to be incomplete .Therefore t = t (R) and its form in (3) is approached only for R-00.in order to retain a simple analytic form of g we shall assume for all R.g taking into account, all results in (3)are applied directly to alkali metal atoms.

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This Can be given only if the radial, angular, and spin factors are separated explicitly. Omitting the fairly laborious calculations, we present the result:

$$\sigma = \frac{8\pi a_0^2}{k_0^2}\sum_\lambda c_\lambda \int_{k_0-k_1}^{k_0+k_1}\frac{dq}{q^3}\left|\int_0^\infty P_0(r)P_1(r)j_\lambda(qr)dr\right|^2\Phi(q), \tag{4}$$

P_o and P_1 are optical and radial function. F and h are hypergeometric and spherical Besssel equation respectively. Equation (4) was derived on the basis of the same concept such as o final state to initial state of one electron function.

$$\Phi(q) = \delta_{S_1 S_1}\left[f^2(\nu, X) - \frac{q^2}{k_0^2}f(\nu, X)f\left(\nu, \frac{1}{4}\right)\right] + \frac{2S_1+1}{2(2S_0+1)}\frac{q^4}{k_0^4}f^2\left(\nu, \frac{1}{4}\right) \tag{5}$$

With θ (q) = 1, Eq. (4) becomes a Born approximation. The accompanying table gives the cross sections for resonance levels obtained in our new model with help of Born approximation X1is scattering electron in threshold units.

$$f(\nu, z) = \frac{\pi\nu}{\sinh \pi\nu}F(-i\nu, i\nu, 1, z),$$

$$X = \left[\frac{\Delta\epsilon + q^2}{\Delta\epsilon + 3q^2}\right]^2, \quad \nu = (k_0 + |\epsilon_0|^{1/2}) \tag{6}$$

The case of more complex atoms becomes somewhat less involved because the addition of angular momenta and spins must be taken into account. It is found that the method used in (3) to calculate the transition of the internal separation and spin part of matrix element so general formulae of cross section for transition state given by

$$c_\lambda = (2L_1+1)\left\{\begin{matrix}\lambda & l_1 & l_0 \\ L_p & L_0 & L_1\end{matrix}\right\}(2l_1+1)(2l_0+1)(2l_1+1)$$
$$\times\left(\begin{matrix}\lambda & l_0 & l_1 \\ 0 & 0 & 0\end{matrix}\right)^2 \tag{7}$$

With f = 1, Eqs. (4) and (5) are extend form of Ochkur et al (1964) formulas used for calculation of cross section of many transition state in alkali metals atoms.

$$x_1 = k_1/k_{thr} = \left[(k_0^2 - \Delta\epsilon)/\Delta\epsilon\right]^{1/2}. \tag{8}$$

Excited state up to 5p resonance inner cell to next term 6p involves main series of Rubidium as shown in the figure 1 and 2. Data and graph structure analysis for our New model and its approach on same aspect .it has been observed similarity in graphs some extent which imply the similarity in theoretical and practical observations. The graphs are analysed and compared with other observed fact. We at present have no perfect measurement of cross sections so that only the energy dependence of the excitation functions can be compared

with the theory. In addition, cascade transitions must be considered even it is approximately. We adopted the following procedure.

Experimental cross section at the maximum energy 30 eV is equated to total cross sections for the direct and excitations using the discussed New model. The

figure 1and 2 shows that at this energy transitions via an intermediate level play only a small part. The figure 1 & 2 also includes experimental curves 5 normalized in this manner. The curves 6 were obtained by subtracting cross sections for excitation. The figure shows that the experimental maximum for the 5s -6p transition is about twice as large as the value.

Table 1. Alkali Metals with Cross Sections for resonance transition observation Table

X_1	Li 2s 2p		Na 3s 3p		K 4s 4p		Rb 5s 5p		Cs 6s 6pf		CS 6p 6pf	
	Born Aprox	New Model	Born Aprox.	New Model	Born Apro.	New Mode	Born Aprox	New Model	Born A Prox	New Mode	Born A lpro	New Model
0.2	55.6	7.2	43.3	5.6	67.9	6.2	76.8	6.5	35.3	2.8	6.07	4.4
0.4	97.1	13.8	75.6	10.8	121	12.4	138	12.2	63.1	4.4	110	8.3
0.6	120	19.3	96.7	15.6	155	18.5	176	19.7	80.5	7.5	141	13.6
0..8	127	23.9	10.5	19.3	171	24.7	194	20.1	88.6	10.8	157	19.2
1.2	119	30.7	102	27.5	169	37.5	192	40.5	87.5	16.5	157	30.6
1.6	101	34.8	89.2	32.9	149	47.9	170	51.2	77.1	21.4	140	39.5
2.0	83.7	36.3	75.4	34.5	126	51.4	145	57.4	65.5	23.7	120	45.6
2.8	58.2	33.6	53.6	32.7	90.8	51.5	104	56.2	47.0	24.4	86.2	45.4
3.6	42.3	29.2	39.4	28.1	67.1	45.12	76.6	50.5	34.6	22.3	63.9	41.2
4.4	32.0	24.2	30.1	23.6	51.4	38.8	58.7	43.5	26.5	19.1	49.3	35.5
5.2	25.1	20.1	23.7	19.8	40.6	32.2	46.4	37.2	21.0	16.6	38.8	30.4
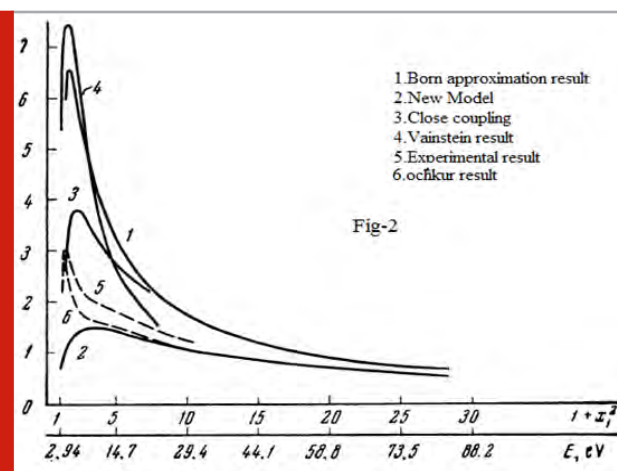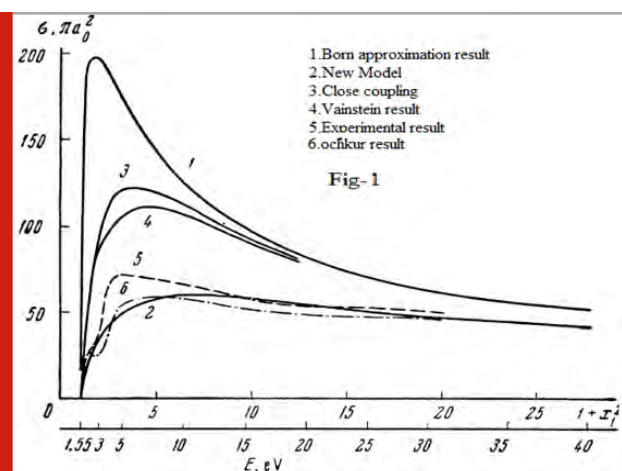
calculated from the New model. Assuming the same for the other non-resonance transitions, in the process of subtracting we multiplied the cross sections for transitions when E < 30 eV by a factor increasing from 1 to 2 at the threshold. In both instances, the cascade transitions played a relatively small part. The excitation function obtained for the 5s -5p resonance transition of new model. The part for the 5s -6p transition at the threshold differs more from the New model as expected but for E > 3 eV there is good agreement. Although the foregoing method of treating experimental data is somewhat arbitrary, it can hardly lead to serious errors.

CONCLUSION AND RESULTS

The physics of collision of atoms has increased the interest in the interaction of atoms with antiparticles is connected with additional possibilities of investigating the dynamics and kinematics of the collisions. For fast

collisions, flipping the sign of the charge of the incoming particle alters the changing the state between the various mechanisms of the considered processes of collisions and subsequent decay of the autoionization states. The sign of the incoming particle, to investigate both the relation between the various mechanisms of excitation and ionization and the effect of peculiarities of the scattering of the particles in the final and initial state. Armin Luhr et al (2008) have worked on one electron excitation and ionizations cross sections as well as the first excited p state of the alkali atoms Li(2s),Na(3s), Li(2s),Na(3s)and k(4s).

Damburg et al (1963) put close coupling of open scattering channels plays an important role in the excitation of alkali metal atoms. An expansion in partial waves is needed to take account of close coupling. Baluja et al (1992) calculated total elastic and inelastic scattering of all rare gases are reported at intermediate energy between range 20 to 1000 eV. Hervieux et al

(1993) obtained total and differential cross sections of dipole excitation in all alkali metal atoms. Senashenko et al (1960) worked on dependence of the differential autonization of incoming small particles has been analysed. Lukas An der Lan et al (2012) predicted that alkali do not submerge in liquid Helium nanodroplets but survive at highly spin states which state that which shows surface of nanodroplets clearly visible.

Maqsood et al (2013) in their paper reported that the cross-section for the excitation for all except resonance level exhibits a sharp peak up to 30eV and diminished by a factor 2 to 5 eV, at the same time the cross section for resonance transition exhibits flatter maxima and decrease by 20% in the same energy region. The graphs and data are analysed and compared with other observed facts. it appears maximum segments of graphs represent similarity, which show that there is similarity in graph some extant, which imply similarity in theoretical and practical observations.

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Impact of Dye Industrialeffluent on Soil Quality Parameters at Rico Industrial Area, Bhilwara, Rajasthan

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ABSTRACT

The current examination was led to gauge the dirt Physico-synthetic attributes and impact of modern contamination on soil quality in the environmental factors of the enterprises arranged in the RICO mechanical zone of Bhilwara city, Rajasthan. The dirt examples were gathered from Five unique businesses during the long periods of March-April (Summer period) of the year 2019 and examined to discover the dirt's physical and synthetic attributes. Diverse five destinations were chosen in every territory for the assortment of soil tests from ten distinct areas. In soil tests different boundaries were dissected: pH, electric conductance, bicarbonates, Ca, Mg, Na, K particles, micronutrients like Fe, Cu, Mn, Zn, all out natural carbon and natural issue. Aftereffects of soil tests demonstrate its nonpartisan to marginally basic nature. Cation and anion fixation, natural carbon, and natural issue were additionally indicating a wide variety in polluted soil tests when contrasted with reasonable cutoff points. The examination presumed that the consistent use of gushing seems to decay soil quality in the region.

KEY WORDS: EFFLUENT, PHYSICO-CHEMICAL PARAMETERS, MICRONUTRIENT ORGANIC MATTER.

INTRODUCTION

Soil is the most important factor, which determines the vegetation of a particular area. The common practice of discharging industrial effluents to the aquatic system is continuing. People utilize the water contaminated with the industrial effluent for irrigation purposes. This practice is deteriorating the quality of the soil. The dirt has a private and broad part to keep up a reasonable climate and to limit contamination (Malik A., (2017).

The material business is probably the biggest business on the planet. The material enterprises have involved a significant situation in the modern area of Bhilwara. Material coloring enterprises have an extraordinary probability to caused water bodies contamination and the whole climate too. It is assessed that more than 10,000 different colors and shades are utilized businesses, the sort of cycle utilized relies upon numerous attributes including kind of materials, for example, yarn, texture, fiber, piece of clothing, and texture development, as likewise the nonexclusive sort of fiber, size of color parcels and quality necessities in the colored fabric (Haroon et. al. 2019; Deka and Bhattacharyya, 2007).

The squanders delivered from material ventures cause soil, surface, and groundwater contamination, other than causing a few unfriendly impacts on rural items, creatures, and the wellbeing of individuals living around there. The debasement of soil quality at last influences the groundwater quality just as yields or other vegetation creation in and around the defiled regions. The poisonousness brought into the dirt by effluents may

continue for quite a long time and antagonistic impacts might be felt over an extensive stretch (Patel and Das. 2015; Ladwani et.al. 2012).

In the current examination, an endeavor has been had to evaluate the effect of material businesses on the dirt nature of the RICO mechanical zone, Bhilwara by observing different Physico-synthetic boundaries of tainted soil of material ventures and contrasting outcomes and admissible cutoff points.

Figure 1: Map of Bhilwara RICO industrial area covering selected study sites' location. Site 1, Site 2, Site3, Site 4, Site 5. Universe
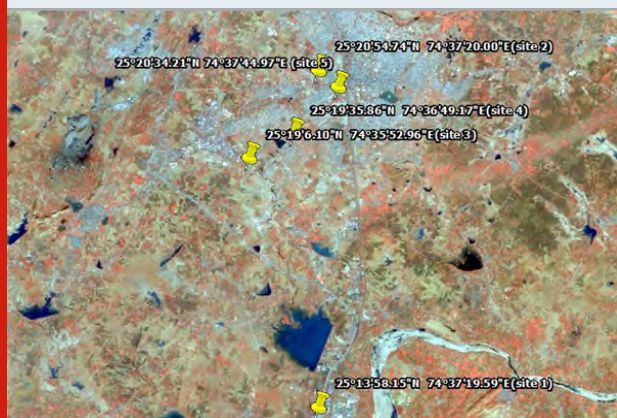
Study Area: The textile industries situated in the RICO industrial area Hamirgarh and Mandal of Bhilwara were selected for the study area. The selected area is located 15 km in the north and 20 km in the east on national highway 79. Dye industries required a lot of water during dye processing. This untreated or partially treated wastewater is being discharged directly into drains that connect the industry to the main drainage network or nearby open land. Since the wastewater is being used for crop cultivation which affects the nearby agricultural land. Soil samples were collected in the summer season in May 2019 from the area surrounding the selected five industries in this area for the study of soil quality parameters.

MATERIAL AND METHODS

Soil samples were collected from the nearby agricultural land where untreated industrial effluent is used for irrigation purposes. Three replicates of each sample from ten different locations were collected from 0-9-15cm depth. Composite samples for each replicate were prepared, air-dried, gently crushed, and passed through 2mmsieve. Sieved soil samples (<2 mm) were stored in plastic bags for further analysis. The collected effluent samples have been analyzed to determine their physicochemical parameters. The water and soil samples were collected during May 2019.

Table 1. Analysis of physicochemical parameters of soil samples of selected study areas

Samples	Industrial soil	Agriculture soil	Industrial soil	Agriculture soil	Industrial soil	Agriculture soil	Industrial soil	Agriculture soil	Industrial soil	Agriculture soil	Permissible limit (ISOSS)
Parameters	I	I	II	II	III	III	IV	IV	V	V	
Color	Dark brown	Brown	Black	Black	Brown	Black	Black	Dark brown	Brown	Black	NA
Temperature (°C)	19.0	17.25	18.5	18.25	20.6	18.35	19.5	17.0	20.5	17.0	NA
Ph	7.8	8.1	9.9	8.9	8.1	8.2	8.5	8.7	8.2	8.1	7-8.5
Electrical conductivity (µs/ms)	10.0	6.3	2.3	1.1	13.0	11.7	5.9	4.8	20.5	4.2	0-1
Organic carbon (%)	1.2	1.3	1.08	1.1	0.6	0.45	0.3	0.45	0.6	0.45	0.5-0.75
K(mg/l)	800	744	800	400	648	440	800	800	800	800	142-337
P(mg/l)	132	24	18	12	30	24	102	42	78	18	23-56
Fe(mg/l)	1.384	1.314	8.28	4.982	1.680	1.576	1.436	4.178	2.344	3.794	4.5
Cu(mg/l)	2.556	2.264	2.614	2.350	2.730	2.498	2.556	2.878	3.228	3.316	0.20
Mn(mg/l)	0.000	0.000	0.252	0.000	0.000	0.000	0.000	0.000	0.044	5.070	2.0
Zn(mg/l)	o.626	0.506	1.956	1.408	2.080	2.418	1.112	0.846	2.630	2.272	0.6

Temperature and pH were recorded on the field. The soil samples have been analyzed for pH, electrical conductivity (EC); water holding capacity (WHC); percent organic carbon (OC); and organic matter (OM); available phosphate (P) and potash (K); available sodium (Na); bicarbonates (HCO3); calcium (Ca) and magnesium (Mg). The effluent samples were analyzed for pH; electrical conductivity (EC); Cation and anions concentration.

Electrical conductivity was measured by digital conductivity meter taking 1:10 soil water suspension, Organic carbon is measured by a "Walkley and Black's titration method." Available Phosphorus was measured by stannous chloride colorimetric galvanometer method, determination of potassium in soil K may be done by several methods such as volumetric, spectrographically, gravimetrically, potentiometrically or calorimetrically in soil testing laboratories, it is measured with the flame photometer, Sulphur in soil measured by colorimeter or spectrophotometer. And the determination of micronutrients in soil Fe, Cu, Mn, or Zn measured by Atomic Absorption Spectrophotometer (AAS) Method. Water-soluble salts were measured by adopting standard methods.

RESULTS AND DISCUSSION

The value of physicochemical parameters in the soil sample and industrial soil sample in each case are given table no.1observed in the summer season. All the results compared to standard permissible recommended by the Indian Society of Soil Science (ISOSS). The site I, Site II, Site III, Site IV, Site V. Effluent from the dying and printing units in Bhilwara RICO Industrial area consists of dyes, bleaching agents, acid, like metals and micro & macronutrients Cr, Cu, Fe, Pb, Zn, and Mn are flown into in this industrial area without any treatment or partial treatment. This untreated water is used for irrigation in the nearby agriculture fields.

The temperature of the contaminated soil sample was greater than that of the forest soil in all the four rounds this may be due to the reaction of chemicals present in the effluents in the soil.

pH: pH is a measure of acidity or alkalinity of the soil. The standard permissible limit of agriculture soil is set by ISOSS is 7-8.5. In the present study, the value of pH ranged from 7.8 to 9.9 maximum pH was recorded at Site II, indicating the flow of alkaline effluents from the textile units. [Figure1]

Electrical conductivity (EC): Ionic matter in the industries effluent has increased the conductivity of the soil around the industries. In the present study, the value of EC for all the samples ranged from 1.1 to 20.5 μs/ms. The maximum value was recorded at Site V. [Figure1]

Organic carbon (%): High value of organic carbon was found around the industry indicating the accumulation of organic wastes, which may adversely affect the soil quality by reducing bulk density. In the present study from the value of Organic Carbon found around the industry the highest value is 1.3 % and the lowest value in 0.3 Site I and Site IV[Figure1]

Potassium (mg/l): In the contamination of concentration in soil sample was varied from 440 to 800 mg/l which were beyond the permissible limit [142 to 337 mg/l] of potassium in agriculture soil. The maximum values were

recorded for site fourth and site five in more than the site [800 mg/l]. [Figure 2]

Phosphorus (mg/l): The amount of inorganic phosphate was very high in contaminated soil, most of the samples were found to be lower than to highest desirable value 12 to 102 mg/l. The permissible limit is 23 to 56 mg/l as given by ISOSS. The maximum value was reported for site All the values are higher than the site I agriculture soil (1.3) indicating more availability of Cation and anion present in this area. In the present study from the value of Organic Carbon found around the industry the highest value is 1.3 % and lowest value in 0.3 Site I and Site IV[Figure1] [102 mg/l]. [Figure 2]

Iron (mg/l): The iron concentration in the study areas were varied from 1.314 to 8.28 mg/l. The Permissible limit's 4.5 mg/l. The maximum value was recorded for site two 8.28 mg/l. [Figure 3]

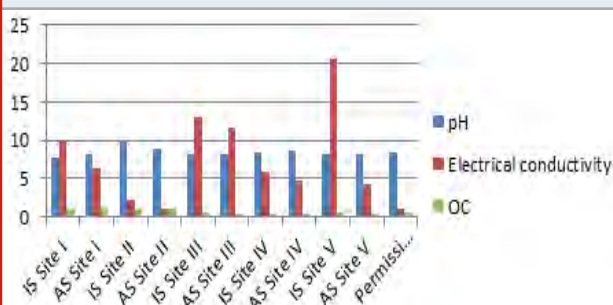Figure 1: Comparison of pH, EC, and OC of selected study areas.

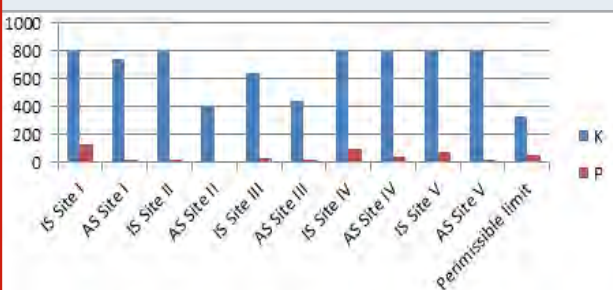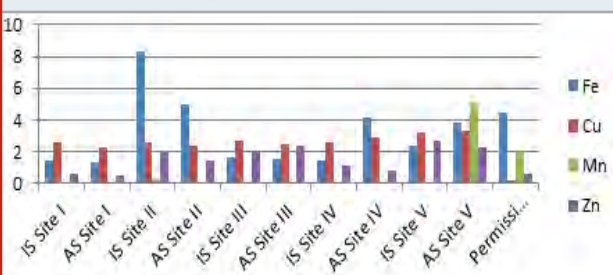Figure 2: compression of K and P of selected study areas.

Figure 3: Compression of micronutrients Fe, Cu, Mn, and Zn of selected study areas.

Copper (mg/l): The permissible limit is 0.20 mg/l as given by ISOSS. In the contaminated soil, it is ion ranged from 2.264 to 3.228 mg/l. [Figure 3]

Manganese (mg/l): The standard permissible limit of soil set by ISOSS 2.0mg/l. In the present study sample, Mn ranged from0.000 to 5.070 mg/l. The maximum value was recorded at site V.

Zinc (mg/l): The ion of Zn the standard permissible limit of soil ISOSS 0.6 mg/l. In the present study, the sample was ranged by 0.506 to 2.630 mg/l. The maximum value was recorded at site V. [Figure 3]

CONCLUSION

The examination has indicated that material handling units in the RICO Industrial region of Bhilwara locale, release emanating with high defilement of natural toxins, cations, anions, and harmful tones which are not quiet submission with standard passable cutoff points. The outcomes showed that the use of modern gushing influences the physicochemical properties of soil. There is a pressing requirement for appropriate administration practices of wastewater for water system purposes. The investigation proposes that the nonstop use of profluent seems to fall apart soil quality just as richness. It is presumed that the treatment of wastewater before its re-use for water system

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Matlab Based Kinetic and Isotherm Analysis for the Recovery of Chromium (Vi) and Lead (Ii) Using Ulva fascia

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ABSTRACT

Generation of industrial wastes has significant contribution in altering the contents of water to a greater extent. Of these wastes, heavy metals are a major class with the challenge of non degradability by any means. Hence the safer disposal by removing them using indigenous method is essential. In this perspective, an attempt has been made to recover chromium and lead from dilute solutions by adsorption method. *Ulva fascia*, a marine algae has been used as a sorbent in protonated form to recover the metal ions. Under optimum pH, agitation rate and sorbent size and dosage for each of the metals, a maximum removal percentage of 97 and 94 were observed for chromium and lead respectively. The corresponding metal uptakes were 32.3 and 58.75 mg/g respectively. The kinetic studies revealed that sorption pertained to Lagargren First order kinetics and the isotherm studies proved the validity of Redlich Peterson model for the two metals.

KEY WORDS: BIOSORPTION, CHROMIUM, LEAD, MARINE ALGAE, MATLAB.

INTRODUCTION

A significant level of risk to the life of inhabitants of all the species occurs from pollution. Pollution can be on to the land, water and air mainly from man made sources. The present report focuses on the control of water pollution by heavy metals. Water resources of a country being a vital asset, decides the economy to a greater extent (Vasudevan and Oturan, 2014). One of the big challenges faced in the 21st century will be the problems pertaining to the quantity and quality of water (Schwarzenbach et al., 2010). Water pollution implies the contamination of water bodies by human activities. Industrial, domestic and agricultural practises for global improvements are the instances of such activities (Sivaprakash and Ramsenthil,

2017). Pollutants can be inorganic, organic, renewable, non renewable, degradable, non degradable, etc. Heavy metals come under the category of inorganic, non degradable but recoverable one (Gupta et al., 2012).

A significant volume of toxic waste containing heavy metals is released into surface and underground water with the rapid growth of industrial activities, resulting in a number of environmental problems (Barakat 2011). Chromium, cadmium, lead, mercury, nickel, and copper are common toxic heavy metals (Owlad et al., 2009) which enter water bodies from industrial discharges. They accumulate and cause extreme health disorders to the aquatic life and other living organisms consuming it (Tran et al., 2010). They enter the human body through the food chain and cause cancer, damages to the central nervous system, lungs, brain, etc. (Karthik and Meenakshi 2015). Hence it is very much essential to develop efficient technologies for the removal of heavy metals from effluents as per the pollution control legislations prior to the discharge into the environment (Wang et al., 2015, Mondal, 2009).

In the present study, chromium and lead have been considered for investigating the feasibility to recover those metals from synthetic effluent using a simple method. Chromium is one of the most predominant heavy metal pollutants in industrial waste water (Bhaumik et al., 2012) and listed as a primary pollutant and ranked at Department of Energy (DOE) sites as second among many toxic metals in the ecosystem for occurrence frequency (Singh et al., 2011). Cr is released into surface water bodies, soils, and aquifers by many industrial processes and applications, such as electroplating, metal finishing, magnetic tapes, pigments, leather tanning, wood preservation, chemical production, brass, electrical and electronic devices, and catalytic processes (Rajapaksha et al., 2018). They are discharged in concentrations ranging from tens to hundreds of mg / litre (Gupta et al., 2010). Out of the two possible states, Cr(III) is much less soluble and relatively stable. However, Cr(VI), such as chromate (CrO_4^{2-}, $HCrO_4^-$) and dichromate ($Cr_2O_7^{2-}$) are highly soluble and mobile in aqueous solutions (Geng et al., 2009).

Hexavalent chromium ranks 16 among the toxic pollutants and has been a major health issue due to its carcinogenic and teratogenic features (Bansal et al., 2009). The overall permissible limit of Cr(VI) into inland surface water is 0.1 mg / L and 0.05 mg / L into drinking water as recommended by the World Health Organization (WHO) (Wang et al., 2013). Dermatitis and ulcerations of intestine are caused by exposure to Cr(VI) (Neagu and Mikhalovsky 2010). The extreme toxicity of hexavalent chromium makes it mandatory to recover from industrial effluents before let out to water bodies (Arroyo et al., 2009). This has led to the need for research to find methods for the treatment / removal of chromium (Shi et al., 2009, Sivaprakash et al., 2020).

Lead (Pb) is an essential metal existing in two states of valence: Pb(IV) and Pb(II) (Lyu et al., 2017). Pb(II) is one of the most commonly disturbed ions in the world and also significantly a hazardous heavy metal (Tan et al., 2012). The discharge of untreated effluents from battery processing, electroplating and the combustion of automobile petrol can cause elevated Pb(II) ion concentration in surface water and groundwater (Zhang et al., 2010). As set by the EU, USEPA and WHO, the permissible level for lead in drinking water and surface water intended for drinking is 0.010, 0.015 and 0.010 mg/1 respectively (Li and Wang, 2009). Severe symptoms, such as anaemia, cancer, kidney disease and mental retardation, are caused by drinking lead-polluted water. Pb(II) must be removed from aqueous solutions for the sake of ecological health and public safety before the waste water containing Pb(II) is released into the natural environment (Hu et al., 2015).

Precipitation, membrane based separation, dialysis, chemical methods have been used for the removal of heavy metal ions over the years (Rai et al., 2016). These methods have many limitations, in terms of high cost, emergence of secondary pollutants, low level of recovery, need of large amount of chemicals, etc. (Guo et al., 2018). The unit operation, adsorption had been considered as a major replacement to all the above mentioned on industrial scale. This is due to the simplicity of the operation, wide range of available sorbents, ease of handling, lack of secondary pollutants and no additional requirement of chemicals. The major task in adsorption is the selection of sorbents which depends on the availability, effectiveness, cost, pre treatment requirement. (Alam et al., 2012).

Of biological origin, the ubiquitously available source is the wide variety of algae which can serve as a potential sorbent material. Adsorption using biological materials, has proven to be an effective alternative method to recover heavy metals from effluents. Algal sources have been tested as sorbents for their potential to recover heavy metals by many researchers. Marine sources are a major supply of varieties of algae which are widespread in coastal area. The rich content of functional groups like carboxylic acid, sulphonic acid and many more anionic groups offer greater binding of the cationic metal ions and help in recovery of heavy metals from industrial effluents (Sivaprakash et al., 2020). The objective of the present work is to experimentally investigate the ability of the algae Ulva Fascia in protonated form to recover of chromium and lead ions. Based on the experimental observations, modelling studies on kinetics and isotherms were carried out.

MATERIAL AND METHODS

Sorbent collection and preparation: The green algae, Ulva Fascia (dead form) was collected from Tirunelveli region coastal area, Tamil Nadu, India. By using distilled water soluble materials and particulate matter were removed. They were sun dried and grounded to less than 0.1 mm diameter and 0.1 N HCl was used for protonation with the contact time of 10 h. Again it was washed and dried at 50º C for 12 h. This sample was stored and used for the sorption experiments.

Sorbate preparation: The stock solutions of Cr (VI) and Pb (II) were prepared by using potassium di chromate and lead nitrate (analytical grade) respectively from Sd fine chemicals Ltd. (India) by dissolving it in deionized water. Nitric acid solutions were used to maintain the pH in acidic regime.

Batch Experimentations: The experiments were conducted in Erlenmeyer conical flasks using the sorbent biomass of 0.75 g for Cr and 0.8 g for Pb in one litre

of the sorbate solution. The pH was maintained at 5 for chromium and 6 for lead with the agitation rate at 250 rpm for both. Cr (VI) and Pb (II) solutions were prepared in various initial concentrations viz. 50, 100, 150, 200 and 250 mg/l at room temperature. The experiments were repeated twice and for the investigation the mean values were used Cr (VI) and Pb (II) contents were analysed using Atomic absorption spectrophotometer. In the adsorption experiments, metal uptake(q in mg/g) is an important term and is given as:

$$q = V(C_o - C_f)/M \qquad (1)$$

where C_0 and C_f are the initial and final metal ion concentrations in the solution (mg/l), V is the solution volume (l) and M is the biosorbent mass (g).

Sorption Kinetics: Three kinetic models have been taken in the present investigation namely the Lagergran First order kinetics, Pseudo second order kinetics and Fractional order kinetics for modelling of the metal uptake. The kinetic model equations are given below.

Lagergran First order kinetics (LFOK):

$$q = q_1 (1 - e^{-k_1 t}) \qquad (2)$$

Pseudo -Second order kinetics (PSOK):

$$q = \frac{tk_2 q_e^2}{(1 + tk_2 q_e)} \qquad (3)$$

Fractional order kinetics (FOK):

$$q = k_{int} t^n \qquad (4)$$

where k_1(min^{-1}) and k_2 (g (mg min)$^{-1}$) are the equilibrium rate constants for Lagergran First order and Pseudo second order kinetics respectively, k_{int}(mg g min^{-n}) and n are the Fractional order kinetics constant.

Sorption Isotherms: Adsorption isotherms are used to predict the characteristics or nature of the metal uptake in the adsorption technique. The experimental data was obtained from batch studies and modelled using the simple adsorption models such as Langmuir (Eqn. 5), Freundlich (Eqn.6) and Redlich - Peterson (Eqn.7) isotherms.

$$q = q_{max} bC_f / (1 + bC_f) \qquad (5)$$

$$q = K(C_f^{(1/n)}) \qquad (6)$$

$$q = k_{RP} C_f / ((1 + (a_{RP}C_f\beta)) \qquad (7)$$

where Cf is the final metal concentration(mg/L), q_{max} is the maximum metal uptake (mg/g), b is the constant

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of Langmuir equilibrium (L/mg), K (l/mg)$^{1/n}$ and n are the Freundlich constants, k_{RP} (l/g), a_{RP}(l/mg)β and β are Redlich Peterson constants.

RESULTS AND DISCUSSION

The protonated algal biomass was used to recover the metal ions from the synthetic solutions at various initial concentrations of Cr (VI) and Pb (II) solutions. The maximum Cr (VI) removal percentage was recorded as 97% with an uptake of 32.33 mg/g for the initial concentration of 50 mg/L. The removal percentage started increasing with decreasing initial metal ion concentration. The removal was 89 %, 76 %, 68 % and 52 % for 100 mg/L, 150 mg/L, 200 mg/L and 250 mg/L respectively. The corresponding metal uptakes were 59.3 mg/g, 76 mg/g, 90.66 mg/g and 104 mg/g. Under the similar operating conditions, excepting the sorbent dosage (0.8 mg/g) Pb (II) was found to have a maximum removal of 94 % with the metal uptake of 58.75 mg/g. For the removal of 80 %,74 %, 66 % and 58% at 100 mg/L, 150 mg/L, 200 mg/L and 250 mg/L initial metal ion concentrations respectively, the metal uptakes were 100 mg/g, 138.75 mg/g, 165 mg/g and 181.25 mg/g. Fig.1 shows the comparison of sorption performance of the algae for the two metal ions. In the percentage removal, decreasing trend for both the Cr(VI) and Pb(II) is due to the lack of enough active sites and surface area for sorption.

Figure 1: Metal uptakes of Chromium and lead ions using Ulva fascia under optimum operating conditions
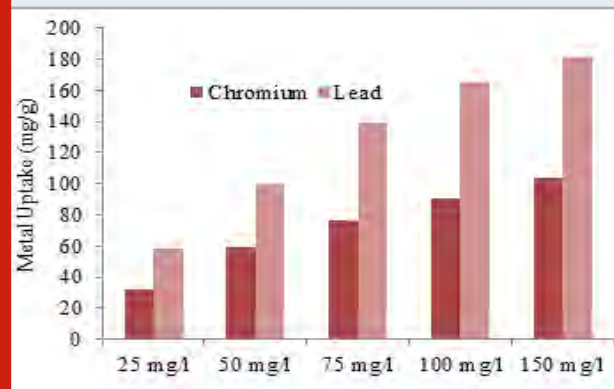
Kinetic Modelling: The cftool kit software available in MATLAB 2014 software was used in the kinetic modelling. LFOK, PSOK and FOK were supplied in the integrated form to the software along with the experimental data. This yielded the regression coefficients and constants for each of these models. The data obtained for Cr (VI) and Pb (II) are given in Table 1 and 2 respectively. The modelling results show that, the LFOK model fits the kinetic mechanism for both the metal ions using the chosen algal biomass.

Table 1. Constants of the kinetic models for Cr (VI) removal by *Ulva Fascia*

Kinetic model	Parameters	Initial metal concentration(mg/L)				
		50	100	150	200	250
Lagergran first order kinetics	k_1	0.0055	0.0029	0.0057	0.0055	0.0059
	q_1	41.43	101	94.45	111.6	127
	R^2	0.9970	0.9844	0.9966	0.9884	0.9895
Pseudo second order kinetics	k_2	$5.81 \times 10-5$	$1.15 \times 10-5$	$2.7 \times 10-5$	$2.2 \times 10-5$	$2.2 \times 10-5$
	q_2	64	163.6	144.1	170	190.1
	R^2	0.9946	0.9852	0.9958	0.9852	0.9889
Fractional order kinetics	k_{int}	0.7635	0.7613	1.839	2.129	2.802
	n	0.6694	0.7653	0.661	0.664	0.6431
	R^2	0.9831	0.989	0.9871	0.9803	0.9806

Table 2. Constants of the kinetic models for Pb (II) removal by *Ulva fascia*

Kinetic model	Parameters	Initial metal concentration(mg/L)				
		50	100	150	200	250
Lagergran first order kinetics	k_1	0.006017	0.00223	0.006916	0.005743	0.006963
	q_1	89.29	285	193.2	252.4	208.3
	R^2	0.969	0.9779	0.9806	0.9804	0.9837
Pseudo second order kinetics	k_2	2.232×10^{-5}	2.264×10^{-5}	1.41×10^{-5}	8.149×10^{-5}	1.504×10^{-5}
	q_2	155	530.4	311.9	425	320
	R^2	0.9663	0.9777	0.9779	0.9783	0.9808
Fractional order kinetics	k_{int}	1.237	0.9432	3.453	3.196	3.89
	n	0.7472	0.8873	0.7127	0.7594	0.7046
	R^2	0.9525	0.9763	0.9623	0.9653	0.9668

This was inferred from the R2 values which are nearly closer to unity for the LFOK models compared to the other two models. For all the initial concentration the Kint values were found to be higher for Pb (II) than Cr (VI). This is in accordance with the experimental observation that the Cr(VI) ions had more percentage removal (97%) than that of the Pb (II) ions (94%). The comparison between predicted kinetics and experimental kinetics (three models) for Cr (VI) and Pb (II) are represented in Figs. 2 and 3 respectively.

Isotherm modeling: The adsorption isotherm modelling was performed using the equilibrium metal uptakes and the equilibrium concentrations for each of the metal ions for the different initial concentrations. This was also performed in the cftool kit of the MATLAB 2014 software. The results are presented as comparison between the experimental and model predicted equilibrium uptake values of Cr (VI) and Pb (II) ions against the equilibrium concentration for the three isotherm models in Figs. 4 and 5 respectively. The model parameters and the correlation coefficients can be seen in Tables 3 and 4. The inference from this simulation is that the adsorption of both chromium and lead follows the RP model with greater accuracy than the other two models. The three parameter model takes into account the mechanism of Langmuir and Freundlich models.

Figure 2: Comparison between experimental and model predicted kinetics for Cr (VI) using Ulva Fascia for distinct initial metal ion concentrations
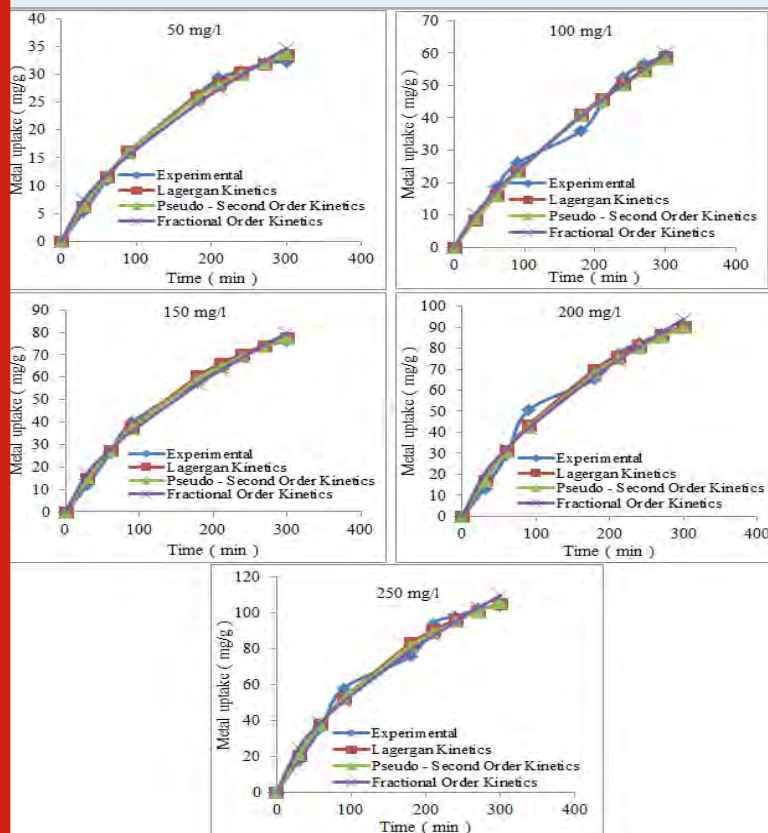

Figure 3: Comparison between experimental and model predicted kinetics for Pb (II) using Ulva Fascia for distinct initial metal ion concentrations
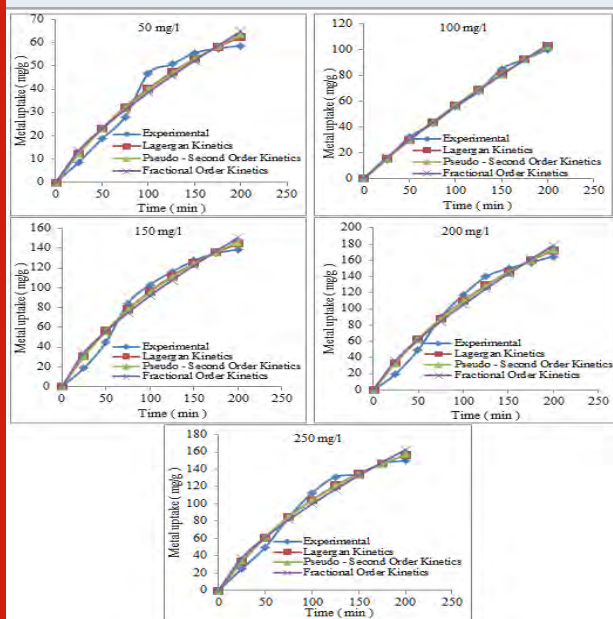
Table 3. Adsorption isotherm model parameters for Cr(VI) ions recovery using protonated *Ulva fascia*

Isotherm model	Constants	R^2
Langmuir	q_{max} = 98.69; b = 0.3467	0.8922
Freundlich	K = 37.95 ; n = 4.14	0.9804
Redlich - Peterson	k_{RP} =186.6 ; a_{RP} = 4.199; β = 0.7977	0.9968

Figure 4: Experimental and model predicted equilibrium uptake of Cr (VI) using protonated *Ulva Fascia*
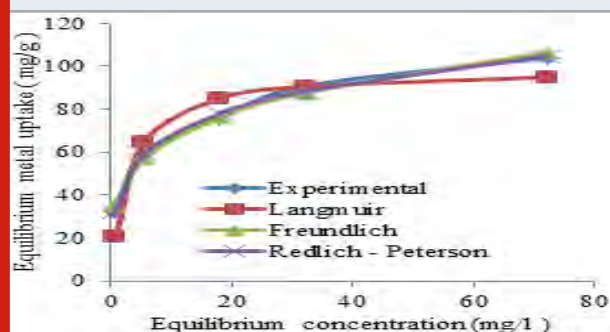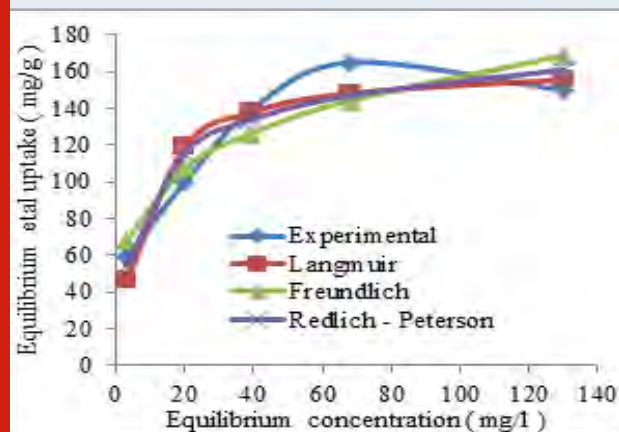
Table 4. Adsorption isotherm model parameters for Pb(II) ions recovery using protonated *Ulva fascia*

Isotherm model	Constants	R^2
Langmuir	qmax = 164.9; b = 0.1304	0.8867
Freundlich	K = 52.14 ; n = 4.145	0.8545
Redlich - Peterson	KRP = 33.86;a_{RP} = 0.3256; β =0.9002	0.9802

Figure 5: Experimental and model predicted equilibrium uptake of Pb (II) using protonated *Ulva Fascia*

CONCLUSION

Bio sorption of chromium and lead metal ions using the marine algae Ulva fascia was inferred to be a prospective mode of waste water treatment with heavy metal pollutants. The algae reported 97 % and 94 % of the two metals respectively. The maximum uptakes were 181.25 and 104 mg/g for Cr and Pb ions. The kinetic studies show that with the regression coefficients approaching unity the sorption follows the LFOK model. Also, it was seen that the Redlich Peterson model fits the adsorption isotherm better than the Langmuir model and Freundlich models. The protonated form of dead Ulva fascia can thus be considered as a potential sorbent to recover Cr(VI) and Pb(II) ions.

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The Role of Emotional Intelligence in Engagement of B-School Faculty Members – an Empirical Study

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ABSTRACT

Sustainability in this competitive world both for teachers and the students is a daunting task. Teachers are faced with different challenges while educating the students since each student has different learning needs. To attract and retain a committed and productive employee is an issue that organizations have to address through reforms (Noe, et al 2008). The proposed study is an attempt to analyse whether employee engagement (EE) is affected by the role of emotional intelligence (EI) in B-school faculty. For the purpose of the study Wong & Law Emotional Intelligence Scale (WLEIS, 2002) has been used to measure EI and Utrecht Work Engagement Scale (UWES) to measure EE. The data was analysed using AMOS 21 and the analyses yielded a good model fit establishing a positive but insignificant relationship between Emotional Intelligence and Employee Engagement.

KEY WORDS: EMOTIONAL INTELLIGENCE, EMPLOYEE ENGAGEMENT, COMMITMENT, PRODUCTIVITY.

INTRODUCTION

The teachers in B-schools not only impart knowledge to the students but are also faced with the challenge of providing holistic knowledge and grooming them to face the challenges put forth by the globalized business environment. What sets them aside from teachers of other subjects is the fact that they are also entrusted with the responsibility of grooming the students to secure good placements in the corporate world. As a result, sustainability in this competitive world both for teachers and the students is a daunting task. Teachers are faced with different challenges while educating the students since each student has different learning needs.

They have to live up to the expectation of the college administration as well as help students and parents meet up long-term goals. Keeping the employees engaged in such situation is a challenge for the organizations also. The work is demanding, performance oriented and doesn't offer job security, especially in private sector. To attract and retain a committed and productive employee is an issue that organizations have to address through reforms (Noe, et al 2008).

There are three types of employees in an organization:
1. Engaged employees are passionate about their work and have a deep connection with their organization. The innovative ideas brought forth by them help in organizational growth.
2. Not-engaged are the employees who are not putting passion or energy into their work and are killing time throughout the day. They are essentially "checked-out".
3. Actively disengaged employees are not only unhappy but are also exhibit their unhappiness at work. These workers undermine the accomplishments of the other engaged workers.

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It is believed that engaged employees exhibit less of alienation and absenteeism (Wagner & Harter, 2006), resulting in financial profits and success for the organization (Czarnowsky, 2008; Xanthopoulou, Bakker, & Schaufeli, 2009). The absenteeism, quality defects at workplace, turn-over rate, safety accident would see a considerable increase due to lower employee engagement levels and could have a negative impact on business performance of the companies as far as productivity and profitability is concerned.The HR practitioners of various organizations and consultancies are taking employee engagement in a positive way looking at the manifold benefits that it offers.

In the current literature, role of emotional intelligence in management is one of the focal points. A good leader should have the ability to understand and regulate his/her emotions as well as that of its peers and subordinates. There is lot of literature to support the fact that emotionally intelligent employees exhibit better performance, have better job satisfaction and are productive at workplace. If the management fosters emotional intelligence in the organization, there will be possibilities of increase in cooperation amongst employees, improved motivation, better performance, enhanced productivity, and profits [George JM, 2000]. The engaged employees have a sense of energetic and effective connection with their work activities, and they find themselves in better position to deal well with the demands of their jobs in contrast to those who suffer from burnout.

Therefore, we can conclude that emotionally intelligent employees are better engaged. The studies conducted so far have been on employees in business houses, construction industry and university teachers but no such study has been conducted on b-school faculty members who have more challenging roles to play as they are also entrusted with the responsibility of making the students good enough to be placed. This gap is being bridged through this study.

Theoretical Background

Emotional Intelligence: A systematic theory of Emotional Intelligence as an intelligence or ability was first proposed by Salovey and Mayer (1990). From both a theoretical and measurement perspective, EI can be divided into ability and trait models. Most of the studies focus on self-report trait EI measures since they are easy to administer and score. However, the challenge is to determine the robustness and validity of these measures across different groups. Supriadi and Sefnedi (2017), in their research established a significant positive correlation between emotional intelligence and job performance. The five emotional intelligent competencies exhibited by leaders, namely intrapersonal relation, self-motivation, self-management, emotional literacy, and self-esteem have established statistically positive effects on the employee engagement (Quang, Ho Nhut, Khuong, Mai Ngoc, & Le, Nguyen Hoang 2015).

Research has indicated that Emotional intelligence

especially mood repair is believed to supplement high levels of employee engagement displayed through higher absorption, vigor, and dedication in employees (Swatee Sarangi & Aakanksha Vats, 2015). Emotional intelligence assists on how leaders and employees meet the daily challenges that they face since emotions either lead to improved or decreased performance. The analysis showed that emotional intelligence has influence on employee engagement (Dr. Caroline Igoki Mwangi, 2014). A moderate but positive and insignificant relationship exists between emotional intelligence and employee engagement. It was also found that there exists positive but insignificant relationship amongst various dimensions of emotional intelligence and employee engagement except well-being (Sunita Shukla, Farhat Mohsin, Vikas Singh, 2013).

Employee Engagement: Tasker (2004) defines engagement as a beneficial two-way relationship where employees and employers "go the extra mile" for one another. Employee engagement has been defined as emotional and intellectual commitment to the organization (Baumruk 2004, Richman 2006 and Shaw 2005) or the amount of discretionary effort exhibited by employees in their job (Frank et al 2004). Work engagement is defined "as a positive, fulfilling work-related state of mind that is characterized by vigor, dedication, and absorption" (Schaufeli & Salanova M., Bakker, A. B., & Gonzalez-Romá, V., 2002)

Vigor: Vigor may be defined as the extent of enthusiasm and the eagerness to perform seen in the employees at the workplaces.

Dedication: It may be defined as employees persevering and being engrossed till the time, they achieve their targets, without being disconcerted by the disturbing external environment.

Absorption: It may be defined as the extent of complete immersion and involvement in the work being performed by an employee in the organization.

Dr. Ikon M.A & Chukwu Anthonette Chika (2017) in their research on 155 university employees found a significant positive relationship between employee voice & turnover intention of employees in the select private universities in Delta State. The researchers concluded that the organization where the employees can raise their voice on matters concerned with them, increases their desire to stay in that organization. There is a significant linear association between the Overall Emotional Intelligence and Overall Work Engagement behavior (K. Ravichandran, R. Arasu, S. Arun Kumar, 2011). The most influential variables or indicators toward work engagement is the perception of organizational support (Erry Wibawa, Arief Daryanto and Amzul Rifin, 2017)

Objectives of the Study: The objective of the proposed study is to analyse whether Emotional Intelligence has an effect on the engagement of faculty members of B-schools. On the basis of the review of literature the

following hypothesis is formulated:
1. To check the reliability of the measures for the proposed study.
2. To check the construct validity of the measures.
3. To analyse the role of Emotional Intelligence on the engagement of faculty members of B-schools

On the basis of the review of literature the following hypothesis is formulated:

Hypothesis: There is no significant relationship between Emotional Intelligence and employee engagement.

Proposed Research Model
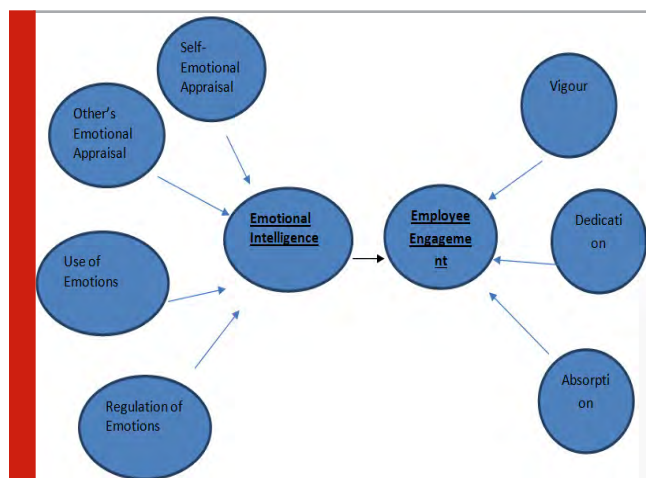
The above Research Model was used to test the effect Emotional Intelligence may have on Employee Engagement.

Research Methodology: The purpose of this empirical study is to analyse the effect of emotional intelligence on employee engagement. The population for the study includes all the b-school faculty members in India but due to paucity of time, cost involved and difficulty in reaching out to the entire population, the research was limited with a sample taken from Delhi NCR. Research design is descriptive type with non-probability purposive sampling technique being used for the study.

Measurement Instruments: For the purpose of this study, standardized scales have been used. For measuring Emotional Intelligence, the Wong & Law Emotional Intelligence Scale 2002 (WLEIS) has been used which consists of 16 statements measured via 7-point Likert Scale. From the scale four variables are derived namely, SEA-Self-Emotional Appraisal; OEA- Others' Emotional Appraisal; UOE- Use of Emotion; and, ROE- Regulation of Emotion. Employee Engagement (EE) was measured using the Utrecht Work Engagement Scale (UWES) by Schaufeli and Bakker (2003) which comprises of 17 items measured via 7-point Likert Scale. The variables vigour, absorption and dedication are derived from the scale. A structured questionnaire set was distributed to 200 employees out of which 157 completed questionnaires were selected for the proposed study. Structural Equation Modelling

(SEM) has been applied since it is a technique which is put to use to study the structural relationship between constructs and the variables measured. For the analysis of data SPSS 21.0 and AMOS 21.0 were used.

Respondents Profile			
Variable	**Classification**	**Sample (n=157)**	**Percentage**
Gender	Female	75	48%
	Male	82	52%
Experience	0-5 yrs	31	20%
	5-10 yrs	44	28%
	10-15 yrsMore	57	36%
	than 15 yrs	25	16%

Findings: For checking the reliability of measurement scale, both composite reliability and Cronbach's alpha were used. All constructs surpassed the cut-off value of 0.7 as suggested by Hair, Black, Babin & Anderson (2014). The Cronbach's Alpha were reported for Self-emotional appraisal, other's emotional appraisal, use of emotions, regulation of emotions, vigour, dedication and absorption (Table 1).

Table 1		
Scale	**Variable Name**	**Cronbach's Alpha**
Emotional Intelligence	Self-Emotional Appraisal	0.928
	Other's emotional appraisal	0.890
	Use of emotions	0.937
Employee Engagement	Regulation of emotions	0.941
	Vigour	0.745
	Dedication	0.948
	Absorption	0.905

To check the construct and convergent validity of the WLEIS, Confirmatory Factor Analysis (CFA) was conducted. The Convergent validity was checked and the results were found to be satisfactory. The composite reliability (CR) was found to be greater than 0.7, the Average Variance Explained (AVE=0.775) is greater than 0.5 and the Composite reliability (CR=0.932) is greater than AVE (Table 2). The results of Discriminant validity were found to be satisfactory i.e., AVE>MSV, AVE>ASV.

Similarly, for UWES, the composite reliability (CR) was found to be greater than 0.7, the Average Variance Explained (AVE=0.816) is greater than 0.5 and the Composite reliability (CR=0.930) is greater than AVE (Table 3).

Table 2		
Scale	Composite Reliability (CR)	Average Variance Explained (AVE)
WLEIS	0.932	0.775

Table 3		
Scale	Composite Reliability (CR)	Average Variance Explained (AVE)
UWES	0.930	0.816

Table 3							
Chi-square	p-value	RMSEA	CMIN/DF	AGFI	CFI	GFI	TLI
13.968	0.376	0.056	1.074	0.905	0.997	0.931	0.995

The model was finalized after achieving good fit. As a rule of thumb, for all three relative fit indices the values greater than 0.90 are indicative of a good model fit (Hoyle, 1995). Though a slightly higher cutoff values, such as 0.95 for the comparative fit index have been recommended by Hu and Bentler (1999).

Table 4. Standardized Regression Weights				
				Estimate
SEA	<---		EI	.872
OEA	<---		EI	.970
UOE	<---		EI	.881
ROE	<---		EI	.789
VI	<---		EE	.952
DE	<---		EE	.917
AB	<---		EE	.837

Table 5. Squared Multiple Correlations	
	Estimate
AB	.701
DE	.841
VI	.907
ROE	.623
UOE	.775
OEA	.942
SEA	.760

The Chi-square was 13.968 and other essential indicators also attained the recommended cut-off values (Table 4) to accomplish the assumptions of model fit and test for CFA (p ≥ 0.05, RMSEA ≤ 0.08, AGFI ≥ 0.90, CFI ≥ 0.90, GFI ≥ 0.90, TLI ≥ 0.90). For calculating the CFA, factor loadings on items of each variable were reported based on standardized regression weight. The items have acceptable factor loading values of greater than 0.5 ranging from 0.78 to 0.97 (Table 5), which ascertains that both construct and convergent validity are achieved.

The Path Model

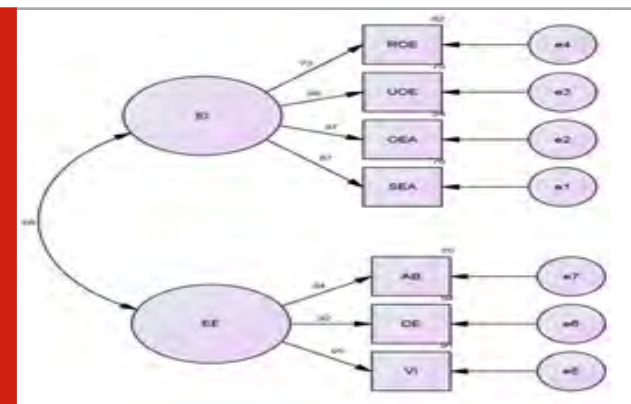The model exhibits a positive (r=0.68) but insignificant (p=0.376) correlation between Emotional Intelligence and Employee Engagement which supports our hypothesis. Therefore, it can be inferred that there is no significant relationship between EI & EE.

CONCLUSION

The study was carried out with the objective to analyse the effect that Emotional Intelligence might have on employee engagement among B-school faculty members. The result indicated a positive correlation but insignificant relationship between emotional intelligence and employee engagement which is consistent with the findings of Sunita Shukla, Farhat Mohsin & Vikas Singh, 2013. The findings of Confirmatory Factor Analysis (CFA) substantiated the construct and discriminant validity. The model was found to be a good fit with all the parameters like RMSEA, CMIN, GFI, CFI, AGFI above the threshold values. The regression weights and correlation co-efficient of employee engagement factors vigour, absorption, dedication with emotional intelligence factors self-emotional appraisal, others emotional appraisal, regulation of emotions and use

of emotions are positive and high (greater than 0.5). Hence, we can conclude that Emotional Intelligence does play a positive role in engaging the employees and that employees with higher Emotional Intelligence levels are better engaged.

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Sociodemographic Status of Breast Cancer Survivors in Chennai

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ABSTRACT

Breast cancer is a life-threatening illness and is the type of cancer most often diagnosed in women. While the survival rate increases with the current option of screening and care, this disease is found in one out of four women. Patients' demographic profile has also had a significant influence on patients' morbidity and mortality, and socio-demographic and clinical factors need to be studied. This research is intended to examine breast cancer survivors' socio-demographic and clinical profile in Chennai, Tamil Nadu, India. Descriptive cross-sectional research was performed at a tertiary care hospital that included 150 breast cancer survivors on therapy with a structured questionnaire to collect data. Participants' mean age was 51.57 ± 9.51 years, 56.67% were overweight, 59.33% had primary education, and 88% were married. Almost all of the participants were semi-urban residents, homemakers and 93.3% received treatment for less than five years and were in the third stage of cancer receiving hormone therapy. Considerably 41.33% of them are living with diabetes as a co-morbid condition. Most of them (76 %) had 4 to 8 hours of sleep. Breast cancer is a public health issue that needs urgent attention. The result will widen the reach for potential researchers and help policymakers prepare exclusive schemes for breast cancer survivors that will increase their quality of life and productivity.

KEY WORDS: BREAST CANCER SURVIVORS, CLINICAL VARIABLES, HORMONE THERAPY, SOCIO-DEMOGRAPHIC VARIABLES.

INTRODUCTION

The most common life-threatening illness among women worldwide is breast cancer. It has a significant effect on

about one in ten women in developing countries and is the primary cause of high mortality (Doyle, 2008). It also accounts for about 30% of the total cases of cancer and 15% of cancer deaths (ASCO,2019; Siegel et al.,2019). Breast cancer is among the leading causes of disability among older women worldwide (Ginsburg et al., 2017). The cancer burden worldwide has risen to 18.1 million new cases, and 9.6 million deaths were caused by cancer in 2018 (Bray et al., 2018). In India, women are considered at risk of developing breast cancer in their early thirties to fifties. However, the risk of occurrence increases before they hit their optimum by 50-64. As a matter of concern, one in 28 Indian women is likely to develop breast cancer

during her lifetime, and urban women are also more likely to develop breast cancer (1 in 22) than the rural population (1 in 60). (ICMR, 2001).

Once they have been advised that once you have cancer, your life will change forever, and it might be challenging even to learn anything else beyond that word "cancer." You have been a cancer survivor by this time (East, 2000). For a person, the cancer survivorship journey starts at the time of diagnosis and continues until the end of life (Rogers et al., 2017). An individual diagnosed with cancer is also called a survivor of cancer (ASCO, 2020). Breast cancer is also distressingly debilitating (Payne et al., 1996). Adverse effects associated with mental health, such as sleep disruption, have also been documented both during and after cancer treatment (Sarvard et al., 2001). Breast cancer incidence was associated with residence in urban areas, high age at first childbirth and high level of education in which the urban women were tended to have better survival in comparison with the rural women. Increased incidence and high case fatality were correlated with childlessness, while the high educational level was associated with the lowest case fatality (Robsham et al., 2005). Exposure to various kinds of environmental toxins can also lead to breast cancer (Carbin et al.,2018).

In breast cancer survivors, cancer reoccurrence has been related to modifiable behavioural factors and clinical and socioeconomic factors that are not modifiable. Obesity (Demark et al., 2012), alcohol intake (Kwan et al., 2010, Simapivapan et al., 2016), hormone replacement therapy (Holmberg et al., 2008), stress (Palesh et al., 2007) and poor physical activity (Lahart et al., 2015, Freidenrich et al., 2016) are lifestyle factors that raise the risk of recurrence of breast cancer (Patterson et al., 2010, Heitz et al., 2018). Clinical factors such as tumour features, hormone receptor status, and primary tumour therapy also predict and do so more strongly than behavioural factors, behavioural factors and socio-demographic and clinical factors have a significant effect on the lives of breast cancer survivors (trialists, 2005, Dent et al., 2007).

Patients with breast cancer survival vary widely depending on a variety of factors, such as age, stage of diagnosis, marital status, level of education, hormonal status, clinical degree of disease, and treatment that contributes to the survival rate of women with breast cancer in India (Sathwara et al., 2017). Despite the growing prevalence of breast cancer, which has been closely linked to socio-demographic factors acting at an early stage in breast cancer identification, no in-depth research has been done so far. The goal of this study is to assess the socio-demographic and clinical profile of survivors of breast cancer.

METHODOLOGY

Study Design and Patients: This was a descriptive cross-sectional study conducted among breast cancer survivors. A total of 150 participants were selected using a convenience sampling technique among those attending Oncology Department, Tamil Nadu Government multi-super speciality Hospital, Chennai – 02. The inclusion criteria were a) diagnosed as adult cancer patients availing treatment, b) able to understand and speak Tamil and c) attending cancer Outpatient and Inpatient department.

Data collection: Potentially eligible women were informed about the study in their preferred Tamil language, and both oral and written consents were obtained. The data collection was done with a structured questionnaire consisting of socio-demographic and clinical variables questionnaire which includes the age, BMI, educational status, marital status, employment status, family income, type of family, co-morbid conditions, cohabitation status, duration of children and presence of children. About 15 minutes were spent on each participant to complete the tool.

Data analysis: Descriptive statistics were used in which demographic variables in categories were given in frequencies with their percentages.

Ethical Approval: Necessary Ethical approval granted by the Institutional Ethics Committee of Tamil Nadu Govt Multi Super Speciality Hospital vide ref.no:1577/ P&D-I /TNGMSSH/20l7 /PMS/003/07/2020. The study also registered with India's clinical trial registry: CTRI/2020/08/027291.

RESULTS AND DISCUSSION

The socio-demographic and clinical variables are considered specific in the disease's occurrence and for enhancing their survival rates. The results of the socio-demographic variables (Table 1) in our study are as follows Among the Breast Cancer Survivors who participated in our study, the age of the participants was, a majority of (34.67%) patients were between 51-60 years, 30.67% patients were between 41-50 years, 20.00% patients were between 41-50 years, and 14.67% patients were between 30-40 years. The mean age of the patients was 51.57 ± 9.51 years (Figure 1). The present study findings correlated with a study conducted by Sathwara JA et al, 2017 in which age of patients ranged from 21 to 89 years with a mean age of 49 years.

The body mass index of the participants were (56.67%) belongs to overweight, 27.33% were under the category of healthy weight ,12% belongs to unhealthy overweight and only 4% of them are underweight(Figure 2). It is consistent with the study of (Chan D.S.M et al, 2014) who concluded that higher the weight leads to the lesser chance of survival. The study findings highlighted that the most of the participants (59.33%) had undergone their primary education, 19.33% had an informal education ,14.67 % of them had their higher secondary education and only 6.67% of them were graduates.(Figure 3) In terms of their marital status, mostly all the participants (88%) were married, 5.33% of them were single and only 3.33% were divorced. As a part of religion, majority of

(82%) them belongs to Hindu religion,(10%) belongs to Muslims and 8% belongs to Christianity. Based on the place of residence, they predominantly were from semi urban habitat (62.67%).36% of them were residing in urban area whereas only 2(1.33%) of the reside in rural areas (Figure 4).

Table 1. Socio Demographic Variables Of Breast Cancer Survivors			
Demographic variables		Number of patients (n=150)	%
Age group	30-40 years	22	14.67%
	41-50 years	46	30.67%
	51-60 years	52	34.66%
	61-70 years	30	20.00%
Body mass index	Underweight	6	4.00%
	Healthy weight	41	27.33%
	Overweight	85	56.67%
	Unhealthy overweight	18	12.00%
Education status	Informal education	29	19.33%
	Primary education	89	59.33%
	Higher secondary education	22	14.67%
	Graduate	10	6.67%
	Professional	0	0.00%
Marital status	Married	132	88.00%
	Divorced/separated	5	3.33%
	Partnered/significant other	2	1.33%
	Single	8	5.33%
	Widow	3	2.00%
Religion	Hindu	123	82.00%
	Muslim	15	10.00%
	Christian	12	8.00%
Residential area	Urban	54	36.00%
	Semi urban	94	62.67%
	Rural area	2	1.33%
Employment status	Full time	3	2.00%
	Retired, not working at all	4	2.67%
	Part time	2	1.33%
	Retired, working part time	0	0.00%
	Full time home maker	122	81.33%
	Laid off /un employed	4	2.67%
	Disabled	0	0.00%
	Self employed	5	3.33%
	Students	0	0.00%
	Others	10	6.67%
Monthly income	< Rs 5000	42	28.00%
	Rs 5000 – Rs 10000	84	56.00%
	> Rs 10000	24	16.00%
Type of family	Nuclear family	123	82.00%
	Joint family	27	18.00%
	Extended family	0	0.00%
Co morbid disease conditions	Nil	87	58.00%
	Arthritis	1	0.67%
	Osteoporosis.	0	0.00%
	Asthma	0	0.00%

Continue Table 1

	Congestive heart failure	0	0.00%
	Heart attack	0	0.00%
	Stroke /TIA	0	0.00%
	Neurological diseases	0	0.00%
	Diabetes mellitus	62	41.33%
	Hypertension	0	0.00%
Cohabitation status	Lives alone or with one other person	50	33.33%
	Stays with two or more other persons	63	42.00%
	Stays with five or more other persons	37	24.67%
Duration of marriage	Nil	8	5.33%
	Less than or equal to 10 years	6	4.00%
	More than 10 years	119	79.33%
	Unknown	17	11.33%
Children	Yes	131	87.33%
	No	19	12.67%

Figure 1: Age Distribution of Breast Cancer Survivors
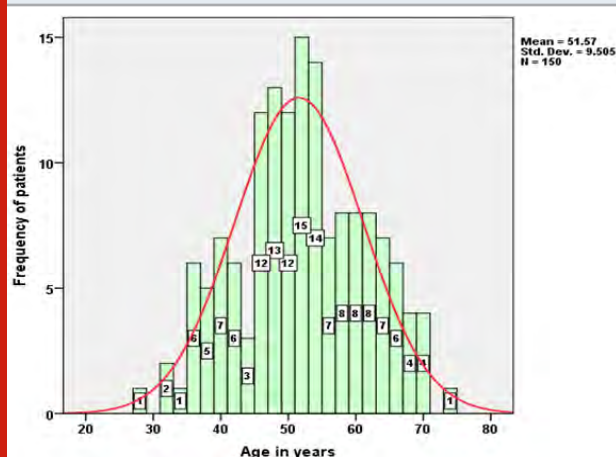
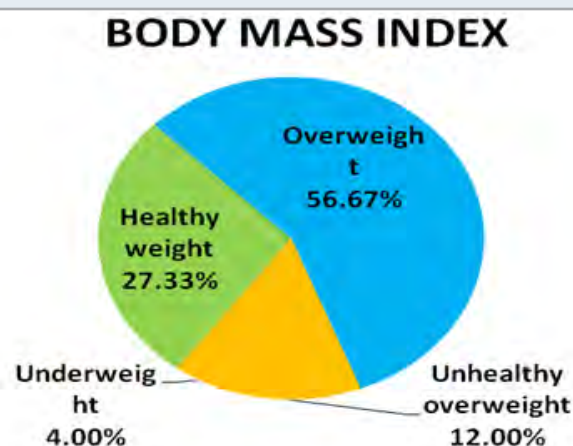Figure 2: Bmi of Breast Cancer Survivors

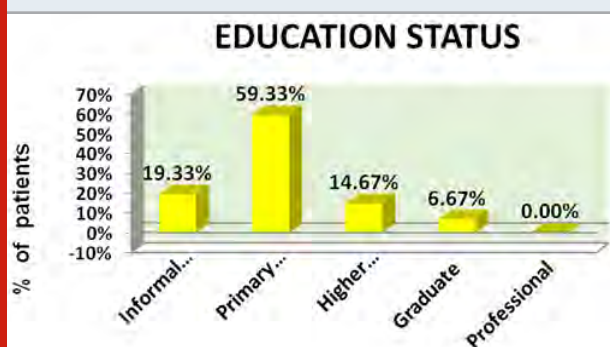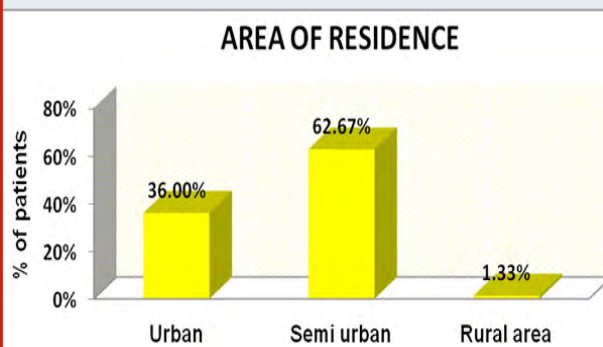
Figure 3: Education Status of Breast Cancer Survivors

Figure 4: Area of Residence of Breast Cancer Survivors

Most of the participants (81.33%) were full time home makers whereas unemployed and retired persons belongs to 2.67% respectively, 2% of them are working on full time basis ,1.33% of them were part time workers and others significantly contribute (6.67%). The level of monthly income of the participants were mostly (56%) in the income range of Rs 5000 – Rs 10000, 28% of them were < Rs 5000 and only 16 % of them were > Rs 10000. About 82% of the participants were living in nuclear family whereas only 18% of them belongs to joint family and none of them belongs to extended family. Most of the participants (58%) do not have any co morbidities, whereas nearly (41.33%) half of them were affected with diabetes mellitus which in turn deteriorates their general health.

The study findings enlightened that the diabetes will increase the mortality rate among breast cancer survivors and decrease their survival (Stephanie s et al,2018). Based on the cohabitation status, most of the participants of

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(42%) were lives with two or more persons, 33.33% of them lives alone or with only one person and 24.67% of them lives with five or more persons along with them. Based on the clinical variables, majority of (93.33%) of the participants were diagnosed with breast cancer of less than five years whereas 6.67% of the participants were diagnosed more than five years and their survival rate was as such respectively (Figure 5). With regard to the stages of breast cancer ,61.33% of them were in Stage III,20.67% were in stage IV,12,66% of the participants had an reoccurrence of the disease,4.67% were having stage II of breast cancer but considerable proportion(0.67%) o comes under stage I (Figure 6).

Figure 5: Duration of Survivorship of Breast Cancer Survivors

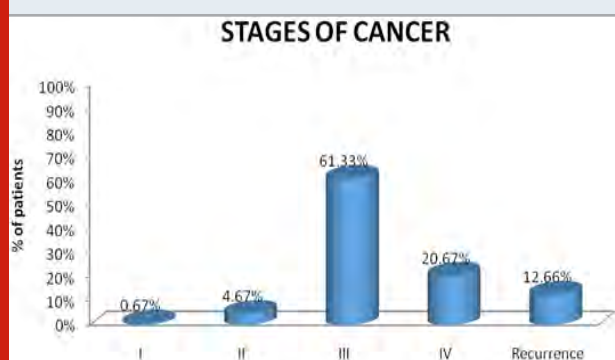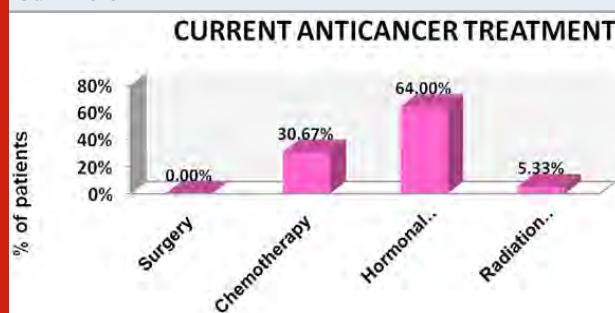Figure 6: Stages of Cancer of Breast Cancer Survivors

Figure 7: Current Anticancer Treatment of Breast Cancer Survivors

Most of the breast cancer survivors (50%) had cancer on their right side breast whereas 48% of them were with left sided breast cancer and only 2% of them were affected on both sides. The breast cancer survivors were undergoing various treatments that includes 64 % of them on hormonal therapy, 30.67% were under chemotherapy and 5.33% of them under radiation therapy. Regarding their performance level, most of (92%) the participants were able perform their activities independently whereas 8 % of them were partially dependant on others for their needs fulfilment. Majority of the (76%) participants sleeps for a period of 4 to 8 hours per day whereas 24 % of the participants sleeps less than 4 hours a day but no one sleeps more than 8 hours.

The sleep problems were consistent with the study by Chan YN et al, 2021 which depicts breast cancer survivors were affected by sleep disorders. The study conducted by Prusty et al the quality of life of breast cancer survivors are hence related to clinical variables such as treatment regimen, performance status, adequate sleep and its risk was 8 times higher among unmarried women, 3 times more among nulliparous women .Breast cancer among urban women which increased with increase in proportion of overweight or obese. Its also found that most of the breast cancer cases were confined to women aged 40–49 years, home makers and upper economic strata group (Prusty et al, 2020)

Recommendations:
1. Based on the study result, the nurse investigator should focus on obtaining baseline data before starting any intervention.
2. The generalization of the study results can be made further replication of the studies in various settings and larger population.
3. The basic needs of breast cancer survivors can be associated with the socio demographic factors.
4. The early detection and prevention of breast cancer can be done based on the demographic data.
5. Baseline data will help the policy makers to implement appropriate schemes for cancer survivors

CONCLUSION

The leading cause of death due to malignancy in women is breast cancer and it is a public health issue that needs urgent attention. This research included information on breast cancer survivors as a baseline. Even though the study is limited to minimal participants(150), it helps the future researchers to plan for their further research and to provide quality care for breast cancer survivors. The findings help policymakers to plan the intervention scheme and specific planning time based on preventive measures for breast cancer and the allocation of specific resources, together with this to overcome the burden of disease, it must be regularly checked for the speedy recovery of clients as early as possible.

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Psychosocial Well-Being Status of Breast Cancer Survivours – an Observational Study

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ABSTRACT

Breast cancer is the most life-threatening disease for women and the second most common form of cancer. According to WHO (2011), the mortality rate of breast cancer among women in 2030 will rise to 11 million. The aim of this research is to determine the Breast Cancer Survivors' selected psychosocial well-being status in a tertiary care hospital in South India. Various studies have shown that the perceived psychosocial well-being conditions of cancer survivors have not been sufficiently met. The psychosocial well-being needs must also be measured as it is holistically expressed in the treatment of breast cancer. It is a cross-sectional study conducted at a tertiary care hospital in Chennai, between August 2020 and November 2020. The sample size was 150 adult female survivors of breast cancer who were on treatment for a minimum of 6 months. Most of them (61.33 percent) were diagnosed with breast cancer IIIrd stage and faced extreme stress levels (77.33 %). 84.00 % patients had a high level of social support and 66.66 % patients had a high level of well-being status . There was a fair correlation between Perceived Stress and Well- being status (P=0.01**)among breast cancer survivors. Breast cancer survivor's psychosocial needs to be assessed periodically to reduce their stress and to improves their Social support and Well-being status. Nurses play a major role in promoting psychosocial adjustment and particularly provide social support during Survivorship period.

KEY WORDS: BREAST CANCER SURVIVOR, PSYCHOSOCIAL, PERCEIVED STRESS, SOCIAL SUPPORT, WELL-BEING.

INTRODUCTION

Breast cancer is the most life-threatening condition and is considered the second most prevalent form of cancer, causing high mortality rates among women, particularly in developing countries, where most cases have been diagnosed at later stages (Ferlay et al., 2015). In recent years, the number of breast cancer patients has been rising (Gartner R et al.,2009). In India, GLOBOCAN 2018 reported that 11 million new cases of cancer were diagnosed, and both sexes were at risk of developing breast cancer among 14% of the total population, causing death among 11-1% of the total cases (Freddie et al.,2018). More attention has been paid recently to the rapidly growing incidence of psychological disorders found in patients with breast cancer. The well-known diagnosis and treatment of breast cancer during and after treatment can be a very stressful issue (Maeda T et al., 2008). It is very important to measure and address the issues related psychological needs because breast cancer diagnosis along with its treatment can contribute to

physical, social, and psychological turmoil (Giese et al., 2011).These challenges were extended to the period of post treatment till recovery.(Bertero et al., 2017) These psychological challenges among breast cancer survivors are related to women's body image, feminity, sexuality and motherhood. Adding to that change in physical appearance, disfigurement after treatment, uncertainty regarding recurrence period of stress, anxiety, depression ,social adjustment and self-esteem (Ahmet et al., 2014) (Ahmet et al., 2014). It is also important to take early steps to treat breast cancer patients and their families with these psychological issues, thus enhancing the quality of life (Gagliardi C et al., 2009).

Female breast cancer is expected to deteriorate a women's sexual identity, thus the impact in terms of stress may be greater than that of other disease. Indeed, women with breast cancer face more discomfort than people with other conditions during survival period (Mehnert A et al., 2014). (Mehnert A et al., 2014). Poor health & management of the family, financial and social life are a source of stress impacting women with breast cancer. Effective social support for patients with breast cancer could help minimise the adverse impact of diagnosis, treatment and encourage their psychological well-being (Calyset et al., 2017). The social networks involve friends, relatives, health care providers and neighbours of members and support types are primarily instrumental, systemic, functional, emotional and information (Abranhamson et al., 2010).

During their survival period, nurses play a major role in the assessment and management of breast cancer patients. When the Survivors Perceive Psychosocial Need for Breast Cancers are properly handled, their quality life will be strengthened to lead a productive life. But studies on perceived needs of the breast cancer clients from the Nursing perspective were not adequately reported in India Therefore we aimed to assess selected Psychosocial factors such as Stress, Social support and well-being status of Breast cancer survivors.

MATERIAL AND METHODS

Study design and setting: It is a Quantitative descriptive cross sectional Observational study conducted at Oncology Department, Tamil Nadu Govt Multi Super Speciality Hospital at Chennai, India. The data were collected from August 2020 to October 2020.

Sample criteria and instrument: Female adult Breast cancers patients in age group of 21 – 80 years who were attending the Oncology clinic for a period not less than 6 months after the diagnosis of Breast cancer were included in the study. Purposive sampling techniques was used to select the sample size of 150 Breast cancer survivors. Samples who were not able verbalise clearly, not understanding Tamil and not willing for the study were excluded from the study.

Demographic data such as Age, weight, area of residence, habits ,etc and clinical variable such as

duration of treatment, Stage, type of treatment such as chemotherapy, Radiation, surgery, etc were collected from the subjects. Standardized tools such as Perceived Stress scale, Multi-dimensional scale of Social support and the Well-being Scale(WeS) were used collect the Data. Necessary written consent was obtained from the subjects to maintain confidentiality. Required Data were collected by interview method and perusal of subject's Medical Record. All participants were screened to determine eligibility for participation in the study.

Stress was measured using the perceived stress scale (PSS), which consists of 10 items and uses a four point Likert scale (0=never,4= very often)(Cohen and Hoberman,1983). Higher score indicated greater stress. Regarding this scale 's reliability, Cranach's α was measured at 0.84 .Social support was measured using the Multidimensional scale of perceived social support (MSPSS),which consists of 12 items organised into three sub – domains (Family, friend, and significant neighbour) (ZIMET et al 1988).Respondent were answered to a seven point Likert scale range from (1= very strongly disagree,7= Very strongly Agree). Higher scores indicate greater support from family, friends, and acquaintances. This scale's Crohnbach's α was 0.88 in the originating research and 0.94 in the present research. Wellbeing level among breast cancer survivors was measured using Wellbeing scale –(WeBS)developed by (ZIMET et al 1988) consists of 29 items organised into three sub – domains included family, friend, and neighbours. Six point Likert scale was used, range between (1= strongly disagree,6=strongly Agree).The higher score mean value (>4), indicate the higher level of wellbeing and the lower score mean value (<4) indicate low level of wellness.

Data Analysis: The collected Data were imported to Microsoft Excel 2010 for data entry. Statistical analysis was performed using the Statistical Package for the Social Sciences IBM© SPSS© version 21 (IBM© Corp., Armonk, NY, USA). Descriptive statistics (mean and standard deviation) were calculated for normally distributed variables including age, marital status, income, comorbid conditions and Treatment duration. Frequencies and percentages were calculated for demographic and clinical data. Association of Demographic Clinical data with stress, social support and Well-being status were done through Chi square test and Mann Whitney U-test / kurskal Wallis H –test. Karl Pearson correlation coefficient was used to find the correlation between the Stress, social support and Well-being status of Breast cancer survivors.

Ethical approval: The protocol for this study was approved by the Institutional Review board of TNGMSSH, Chennai vide reference no : 1577/P&D-I /TNGMSSH/20 l 7/ BMS/003/07/2020. The study also registered with Clinical trial registry of India no: CTRI/2020/08/027291.

RESULTS AND DISCUSSION

The socio demographic clinical data revealed that the mean age of the women were 51.57±9.51 years. Majority

132(88%) of them were married.62.67% of the study participants were residing in semi Urban and 54% were at Urban. Among studied participants, 61.33% were diagnosed with IIIrd stage of breast cancer and half of them (50%) had cancer on the Right side of the breast.

Perceived Stress Level

Table 1. Prevalence Of Perceived Stress Score				
	Maximum score	Mean ±SD	Mean95% CI	% with 95%CI
PSS score	40	33.39±7.19	32.25 -34.56	83.5%(80.6%-86.4%)

Breast cancer patients are having 83.5% of prevalence of stress score. 95% confidence interval showed, it ranges from 80.6% to 86.4%

Table 2. Level of Perceived Stress Scale Score		
Level of score	No. of patients	%
Low	0	0.00%
Moderate	34	22.67%
High	116	77.33%
Total	150	100.00%

Table No.2 shown the percentage of perceived stress scale score among cancer patients. In general, none of the patients are having low level of stress score, 22.67% of the patients were having moderate stress score, 77.33% of them having high level of stress score.

Univariate analysis identifies Hindu patients, Semi urban/ rural patients, Nuclear family patients, Stays with two and more person patients and less than four hours sleeping patients are having more high level of stress than others. Unadjusted odds ratio was given with 95% confidence interval. Multivariate analysis logistic regression identifies Hindu patients, Nuclear family patients and Stays with two and more person patients are having more high level of stress than others. Adjusted odds ratio was given with 95% confidence interval.

Multi–Dimensional Perceive Social Support(PSS)

When using 4 as the cut off for the presence of social support, we found 16.00% of the patients are having low level of social support and 84.00% of the patients are having high level of social support. When assessing the association between Socio-demographic clinical variables with perceived Social support, It was reported that Educational status-graduate patients ,High monthly income (Rs 10000/pm), staying with five or more family members and Recurrence of cancer among breast cancer clients were having more Perceived Social Support score and statistically significant at p≤0.05.Statistical significance was calculated using non parametric Mann Whitney U-test / kruskal Wallis H –test.

Table 3. Identification of influencing factors for high Perceived Stress score using Multivariate logistic regression				
Factors	Univariate analysis		Multivariate analysis	
	p-value	Unadjusted OR(95%CI)	p-value	Adjusted OR(95%CI)
Religion(Hindu Vs Others)	0.02*	4.5(1.9-10.9)	0.02*	8.7(2.7-27.9)
Residence(Semiurban/rural Vs Urban)	0.23	2.5(1.1-5.5)	0.23	0.7(1.1-4.3)
Type of family(Nuclear family Vs joint family)	0.01**	3.0(1.2-7.3)	0.01**	5.1(1.6-16.5)
Cohabitation status (Stays with two and more persons Vs Lives alone or with one other person)	0.05*	2.5(1.2-5.5)	0.05*	2.2(1.2-8.5)
Duration of sleep(< four hours Vs 4 to 8 hours)	0.07	4.1(1.2-14.3)	0.07	3.5(0.9-13.4)

Well Being Status (WeS)

When using 4 as the cutoff for the presence of wellbeing, we found 33.33% of the patients were having low level of wellbeing and 66.66% of the patients were having high level of wellbeing. When analysing the association between Socio-demographic clinical variables with Well-being scale, The result reported that High income(Rs10000/pm),Joint Family System,

Table 4. Level of Perceived Social Support Score		
Level of PSS score	No. of patients	%
<4	24	16.00%
≥4	126	84.00%
Total	150	100.00%

Staying with 2 or more family members, patients with stage I/II and sleeping for 4to 6 hours were having more Well-being score and statistically significant at p≤0.05 significant. Statistical significance was calculated using non parametric Mann Whitney U-test and kruskal Wallis H –test

Table 5. Level Of Well Being Scale (WeBS)		
Level of WeBS score	No. of patients	%
<4	50	33.33%
≥4	100	66.67%
Total	150	100.00%

Table 6. Correlation between Perceived Stress score and well being(WeBS) score			
Correlation between	Mean ± SD	Karl pearson Correlation coefficients	Interpretation
PSS score Vs Well being score	5.63±3.87 Vs 108.95±20.12	r= -0.31 P=0.01**	Fair correlation

Figure 1: Scatter diagram with regression estimate shows the fair negative correlation between PSS score and Well being score among breast cancer patients(r=-0.32 P≤0.01).
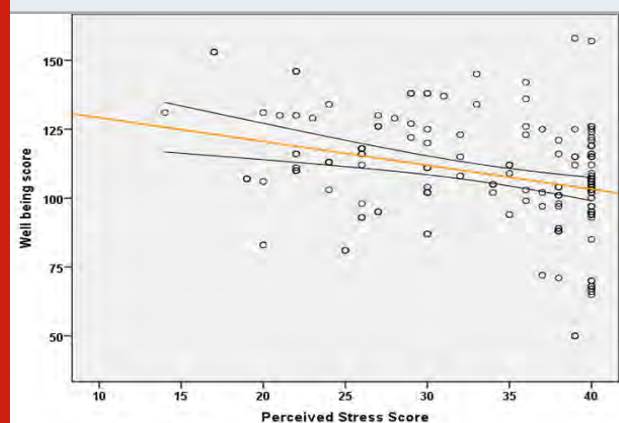
The findings of this study revealed that prevalence among breast cancer survivors of south Indian women was 83.5% and high among survivours residing in semi urban/rural areas .These findings were consistent with results reported by (Alagizy HA et al., 2020) found that prevalence of anxiety ,depression and perceived stress symptoms among breast cancer surviours found to be high (73.3%, 68.7%, 78.2%) respectively. Also another study (Zabora et al., 2001) results were indicated that prevalence of stress in cancer is reported to be above 30%.

In our study mean age of the studied group was 51.57± 9.51 years which was consistent with another another study (Alagizy HA et al., 2020) reported that mean age

When analysing the correlation between Stress and Well-being status among Breast cancer survivours, It was reported that there was a significant, negative, fair correlation between PSS score and PSQI score. It means stress decreases their well being score increases fairly. But, Correlation of Stress with Social Support and Social support with Well-being did not have any statistical significant at P=0.01.

Despite of improvements in early detection and various adjuvant therapies on treatment process of breast cancer continues to elicit more stress among women. The nature of stress may be expressed as stress, depression, anxiety, social isolation and post-traumatic stress etc(Abdel A.M.,1989).Cancer survivors may experience the stress at any stage of their illness from pre diagnosis.

of female breast cancer survivors were 52.29±11.64 years. These findings were also consistent with another study reported by NG–CG et al., 2017. In our study, cancer survivor's occupational status was studied to investigate any association between their economic and employment status and perceived stress level from the findings. Most of the patients were homemakers 76.23% and not employed. Majority (77.38%) were not having enough income per month. This situation was considered as low living status due to high living cost in urban (54.81%) and semi urban (84.04%) setting. Consequently majority of the patients felt burdened by cancer treatment and its expenses, especially when referring to their economic status (Hasan MR., 2015). The study participants Perceived stress level was more prevalent and significantly associated among Hindus, residing at urban ,rural areas ,living in Nuclear , joint family and staying with more than two members.

These findings are in consistent with(Zabora J et al., 2001)whereas this study findings were not consistent another study (Alagizy et al., 2020) , which reported that low income women were characterised by the prevalence of distress, anxiety and depression due to unlikely of received any treatment. This difference may be due to the socio-cultural practices of the patients. The breast cancer survivors were experienced high level of stress during chemotherapy(82.6%) and hormonal therapy(76.04) respectively. These findings were not related to the study findings of Wellisch DK et al., 1989 who found that patients undergone lumpectomy and breast conservative surgery had experienced more stress due to altered body image and worse quality of life . Our study findings shown no significant correlation was identified between stress level with social support

(r=0.127,p=0.12). But stress level is inversely related with wellbeing (r= - 0.307, p=0.01) level and which strongly emphasising on experiencing high wellbeing, might be resulted in perception of low stress among breast cancer survivors.

These findings were not in par with, study conducted by (Puri S et al., 2014), identified that distress was found to have positive correlation with anxiety ,depression in alter the psychosocial wellbeing of the breast cancer survivors. This may be due to the Socio cultural factors of the survivors. Family and social support were important factors in coping with chronic disease condition. Findings of this study shown that, perceived social support was moderately linked with wellbeing status of Breast cancer survivors which leads to increase their life span and emotional wellbeing. These findings were also in consistent with Yoo GJ., et al, 2018; Oztanc G., et al, 2013. The general social support could positively predict changes in subjective wellbeing among breast cancer survivors(Donough MC., et al, 2104). The Study (Kocaman N et al., 2007; Benner A et al., 2017), results shown that low social support was the major reason for pain perception, Stress, and severe depression among breast cancer survivors.

CONCLUSION

Breast cancer survivors are in position to resolve their Psychosocial needs to overcome their disease process.Thes high prevalent stress among Breast cancer survivours leads to negative impact on their health. It is necessary to provide adequate interventions to handle the stress effectively. It is necessary to develop nurse led breast cancer survivorship clinic at the clinical and community setting which helps to tackle the Psychosocial needs of Breast cancer survivors. During the survival stage, women with breast cancer should be able to overcome stress and use appropriate coping methods. Nurses should provide interventions aimed at promoting psychosocial adjustment and particularly provide social support during survival stage. Intensive nursing consultation and support may help to manage stress and thereby promote psychosocial adjustment among women with Breast cancer. Future research should use longitudinal and Multidimensional methods to examine causal relationship between stress, social support and Well-being status among women with breast cancer. Additionally, future research should aim to identify additional factors affecting present outcome variables, and examine a larger and more diverse sample to obtain findings that are more generalizable. Despite some limitations, this research examined a large population of women with breast cancer and compared the various cancer survival stages.

Limitations:
1. The study was conducted at Tertiary care Hospital in Chennai ,Tamil Nadu ,India.
2. Only selected perceived psychosocial variables were assessed.

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