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Influence of Management Information System Integration in Decision Making of Managers

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ABSTRACT

The use of information is substantially recognized in the modern world assisting the company in effective management of its operations. The objective of the present study is to evaluate the influence of management information system integration in decision making of the managers. It also investigated the information systems integration benefits for management decision-making particularly in terms of ease, accuracy, and speed. To this end, the study has employed a survey approach constituting a total population of 112 participants recruited from two organizations; healthcare and financial firm. Respondents of the survey questions were the managers who were associated with firm decision making procedure at different levels. The data gathered was statistically analyzed using SPSS in the form of frequencies, and Chi square test. The results of the study have revealed that the information from the integration of the information system was effective in improving the managers' decision making and which further facilities the organization operations in a positive way. The study further concluded that the management system integration must be sustained in the organization for informed and prompt decision making by the managers.

KEY WORDS: MIS, DECISION-MAKING, MANAGERS, INFORMATION SYSTEM

INTRODUCTION

In recent time, the technological revolution has created great competition in the market, which allows the company to take initiatives to sustain their competitive edge. To take these initiatives, companies require a system that can integrate into different information units, which assists in a successful decision making and adaption to the ever-changing technological environment[1]. These offerings are not required entirely but its possession with respect to accuracy, quality, timeliness, and accessibility is essential so that quality and valuable decisions can be made. Thereby, it is a prerequisite for not only maintaining their functional capacity but for successful achievement of the objectives[2].

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Table 1. Management Decision Level

Management Level	Decision Type	Information System Support
Strategic Management	Unstructured	Executive information system
Tactical Management	Semi-structured	Expert systems, decision support systems
Lower Management	Structured	Transaction processing, automatic decision-making or accounting models

The technology innovation combined with the information needs of the organization is fulfilled by the use of a management information system (MIS). It integrates the information, which supports the functioning of the business, its management, and abilities for decision making[3]. The use of Big Data Analytics development and its benefit for the organization has further been stressed by Loebbeck and Picot[4]. According to them, the BI system improves the functionality of the organization, leveraging its performance. The use of advanced system not only integrates the independent components of the organization but also improve the structural as well as unstructured communication mediums within the organization, improving information retrieval routines[5]. The information system has been used by various studies for the indication of multivariate decisions[6].

Consequently, the decision-making success is partly based on the information provided by the system and partly on the functional process of the organization component. Therefore, the receiving, as well as effectual supplying of the information is essential for the effective decision making of the organization (Table 1).

With context to the human nature, earlier studies have established that the efficiency of organization decision is not guaranteed by the individual perception and common sense. The study by Klatt et al[7] which explored the organization performance provide that the effective decision making within the organization are the result of the effectual evaluation of the data available in the form of information. The study by Lavalle (2011)[8] further adds that the effective evaluation of the organization information is linked to the low reliance on the judgements passed in the unstructured manner, which substantially impact the firm performance. This sets the base for the emergence of information system in various disciplines. This is the reason that managers aspire to design and execute the system which ensures more effective formation of strategies associated with performance of the business. The use of information system and its contribution for providing a competitive edge to the firm has been endorsed by various studies[9,10,11]. The decision making at different levels such as operational, tactical as well as strategic level is supplemented by the data provided by these systems.

Multivariate view of individuals is observed with regard to the utilization of the information system in decision making[9,10,12]. Some of these studies view information system as an investment in the infrastructure, which poses various challenges in execution as most of the managers are oblivious to the kind of information being received, integrating reluctances on its utilization on the part of firm personnel's. The associated cost of the decision is also viewed in a sceptical manner aimed at increasing the firm productivity.

Njonjo[13] stressed upon the integration of the MIS system in manager's decision making as it allows the formation of an effective decision and allows overcoming the issues affecting the origination of effective utilization of resources. Likewise, Wixom, Yen, and Relich[14] also endorsed the use of the system for the fashion retail business, whereas Anderson-Lehman et al[15] highlighted a parallel experience of the manager at an airline firm. Afandi[16] identified that the management information systems impact the job performance among the private sector employees.

Moreover, the system functioning is not only limited to the information but also to disruptions monitoring, which take place in the organization, providing the routes to overcome it and also supplying the alternative actions as reported by Sharma, Mithas, and Kankanhalli,[10]. It produces information products, which assist the decision making and are the outcomes of the collaborative actions among the individuals, technology and procedure[17]. The business administration supports the reports required at the strategic level, conducts internal diagnosis, and assists in planning, controlling, and decision making.

It is statically deemed that controllers at the company invest 70 percent of their time by processing data to the forms, which are requested at a company. Considering this, it is natural that controllers simply do not have sufficient time for generating qualified decisions and producing suggestions for the management, although it should be the most important part of their work[19]. Consequently, the valuable manpower and knowledge of the company is bottled-up by this routine. Additionally, the role of the system is continuously evolving, which requires the integration of this system to provide an actual picture the management information system plays in the managerial decision, along with its mechanism of correlation with decision making in various fields. Shanks and Sharma[20] highlights that the absence

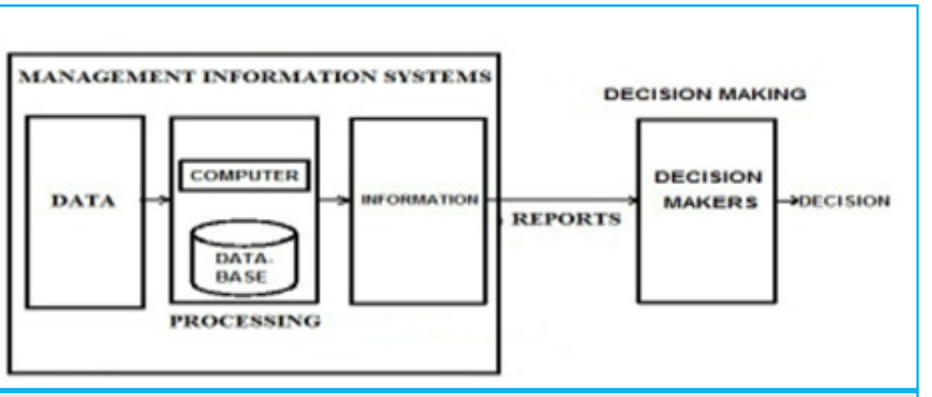

Figure 1. Association between Management Information system and decision making (Source: Al-Mamary, Shamsuddin, and Abdul Hamid[18])

of this system makes it challenging for the business units to provide value-based decisions requiring competitive actions for the business units. More prominently, it is unclear as to how the structural innovation can overcome the parameters set on the production of the valuable insights provided by the system. The research is further driven from the Davenport et al's[21] discussion, which raises questions as to how the decision-making structure and processes impact the manager's ability to produce insights and valuable decision for being executed in the firm. The study's objective is to evaluate the impact caused by the integration of MIS system in decision-making of managers. The study will help in forming a standardized policy for the integration of the MIS system in the corporation.

Hypothesis

The hypothesis set for the study include:

H_0: The MIS has no significant impact on manager's decision making in terms of accuracy, speed, and easiness.

H_1: The MIS has a significant impact on manager's decision making in terms of accuracy, speed, and easiness.

Methodology

The present study employs a quantitative method for evaluating the impact caused by the integration of management information system in the organization on the decisions made by the managers. The study assists in exploring the functional improvement and value provided with the decisions made using the information's provided by the MIS system.

Study Sample

The study was conducted on managers who were employed in both public and private organizations and

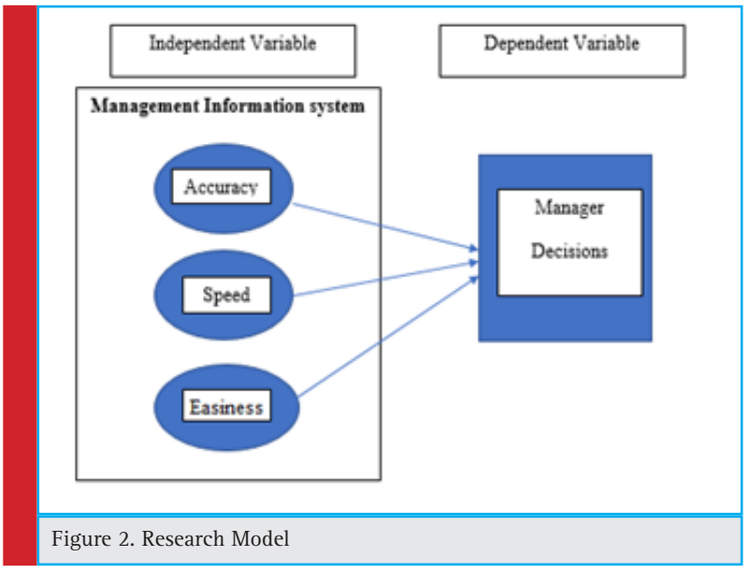

Figure 2. Research Model

equipped with MIS knowledge. The participants of the study were selected randomly from two different corporations belonging to healthcare and the financial sector. The selection of these participants is based on their involvement directly in the decision-making process ensuring that the obtained data is authentic. A total of 112 participants were selected from the top management (strategic), mid-level (tactical) and normal staff.

Study Variables

In the study, the management information system used in the organization is treated as independent variable whereas the manager's decision-making acts as a dependent variable.

Data Collection

The study collected the data by using a self-administered questionnaire based on the information derived presented in the literature review. The questionnaire was prepared on the website named survey monkey, which was then dispersed among the managers involved in the decision making of the two organizations. The items of the questionnaire are related to the quality of decision making in terms of accuracy, speed, and ease of decision making. The perception of the managers is assessed based on the performance enhancement provided by the system integration.

Data Analysis

The collected data was presented and analyzed using Statistical Package for Social Sciences (SPSS) version 20.0. The data was presented through descriptive statistics, percentages and Chi square to draw final conclusions on the findings.

RESULTS

Before evaluating the responses of the participants provided, the items of questionnaire were assessed for calculating the internal consistency of the questionnaire. For this evaluation, the study used the Cronbach alpha. The internal consistency of the items in terms of Cronbach alpha coefficient was 0.979, signifying greater consistency and reliability among the questionnaire items.

The first section of the questionnaire gathered the demographic details of the participants. The responses of the individuals exhibited that the majority of the participants were male i.e. 83 whereas the number of female participants was 29. Considering the age group of the managers, most of these lie in the 25-40 years age group accounting 60.78%.

The following questions after demographic assessed the profile of the managers. Majority of the managers in both the firms were middle managers indicated through the increased percentage i.e. 42.5%, followed by lower level managers (42.5%) and top-level management (18.3%). Along with it, the major population of the managers has 5 to 10 years of experience (34.2%), reflecting upon their involvement in the organization operations, followed by above 10 years of experience (33.3%) and 5 years (25.8%). Considering the education level of the managers, equal population of bachelors and managers was part of the survey i.e. (n = 45), whereas 22 participants hold post-graduate degree.

With respect to the decision making, the managers were first asked about the organization dependency on the information system. The participants also improved the coordination of the individual as highlighted by majority of managers i.e. (n = 88). Their integration also

Table 2. Questionnaire Reliability

Cronbach's Alpha	N of Items
.979	14

Table 3. Participants Demographics

Variable		N	%
Gender	Male	83	74.10
	Female	29	25.89
Age	Below 25 years	19	16.97
	25-40 years	68	60.78
	40 years or above	25	22.32

Table 4. Managers Profile

Variable		N	%
Positions	Lower Level Manager	39	32.5
	Middle Level Manager	51	42.5
	Top Level Manager	22	18.3
Work Experience	5 years	31	25.8
	5 - 10 years	41	34.2
	Above 10 years	40	33.3
Education Level	Bachelors	45	37.5
	Masters	45	37.5
	Post Graduate	22	18.3
Total		112	100

Table 5. Impact of Decision-making on Organization Operations

Decision Making		N	%
Dependency on IS	Yes	81	72.32
	No	31	27.67
Co-ordination Level	Yes	88	78.6
	No	24	21.4
Ease of decision	Yes	84	75
	No	28	25

Table 6. Managers Decision Effectiveness			
Decision Making			
		N	%
Accuracy of Decision	Yes	77	68.75
	No	37	33.03
Speed	Yes	89	79.46
	No	23	20.53
Decision Flexibility	Yes	81	72.32
	No	31	27.67

Table 7. Decision-making and Overall Organization Functionality			
Decision Making			
		N	%
Information Flow	Yes	89	79.46
	No	23	20.53
Improved Monitoring	Yes	73	65.1
	No	39	34.82
Achievement of Strategic Goal	Yes	83	74.10
	No	29	25.89

improved the decision-making ability of the individuals making the formation of the information easy i.e. (n = 84).

Participants were asked about the effectiveness of the decision in terms of accuracy and showed that the information system integration improves the accuracy of the decisions (68.75%). The speed of the decision was also improved subsequent to the integration of the information system (79.46%). The increase in information has induced the flexibility among the managers' decision making (n = 81).

The information system integration has improved the flow of the information within the independent departments of the organization (n = 89). Moreover, the monitoring capacity has also improved with the information system integration as signified by the 73 individual whereas 83 participants highlighted that strategic goals improves the information system integration.

Chi-Square test is one of the most commonly used probability distributions where there are many applications. Chi-Square test of independency is a simple test by the researchers to see if there is a relationship between two variables. This test is carried out by comparing the value determined by the researchers in advance known as the level of the alpha in the value named p-Value calculated from the data available, it will be shown by comparing the two values whether there is a relationship between the two or not.

The Chi Sequered analysis demonstrates the strength of the relationship between the dependence on management information systems and the accuracy of decisions. Table 8 shows that the value of the Chi-Square test is 21.146 with a degree of freedom of 1 The table shows that the minimum value of the significance level is 0.000 which is smaller than the level of of $\alpha = 0.005$, and we accept the alternative hypothesis

Table 8. Chi-Square Tests Dependency on IS * Accuracy of decision					
	Value	**df**	**Asymptotic Significance (2-sided)**	**Exact Sig. (2-sided)**	**Exact Sig. (1-sided)**
Pearson Chi-Square	21.146a	1	0.000		
Continuity Correction	19.132	1	0.000		
Likelihood Ratio	30.428	1	0.000		
Fisher's Exact Test				0.000	0.000
Linear-by-Linear Association	20.958	1	0.000		
N of Valid Cases	112				

Table 9. Chi-Square Tests Coordination level * Accuracy of decision					
	Value	**df**	**Asymptotic Significance (2-sided)**	**Exact Sig. (2-sided)**	**Exact Sig. (1-sided)**
Pearson Chi-Square	15.069a	1	0.000		
Continuity Correction	13.228	1	0.000		
Likelihood Ratio	22.355	1	0.000		
Fisher's Exact Test				0.000	0.000
Linear-by-Linear Association	14.935	1	0.000		
N of Valid Cases	112				

Table 10. Chi-Square Tests Information Flow * Accuracy of decision

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	14.279a	1	0.000		
Continuity Correction	12.462	1	0.000		
Likelihood Ratio	21.273	1	0.000		
Fisher's Exact Test				0.000	0.000
Linear-by-Linear Association	14.151	1	0.000		
N of Valid Cases	112				

Table No. 9 examines the relationship between the levels of coordination in the institution based on management information systems and the level of accuracy of the decisions that deal with this issue. As the figures in the table show the strength of the link between the two variables where the value of test is 0.000 which is smaller than the level of $\alpha = 0.005$, so that we reject the null hypothesis which provides for the independence of the variables and accept the alternative hypothesis A relationship between the two variables

One of dimension of our study is also the study of the relationship between the level of information flow of management information systems and the level of accuracy of decisions, which shows its results in Table 10, which confirms the acceptance of the alternative hypothesis is a relationship between the two variables where the value of the test 0.000 less than the level of $\alpha = 0.005$.

DISCUSSION

As per the results of the survey, managers in both organizations reflected the integration of the information in a positive way. It can lead to additional information about the organization and can also assist in centralizing the management decisions. The results provide that the integration of the system increases the management dependency to pertain its utilization. It is because the nature of both organizations requires prompt responses by the managers as the money is at stake in the finance organization, whereas the human life is at stake in the healthcare. The dependency allows the managers on crafting of information-based decision lacking any sort of biasness towards judgement, as highlighted by the study of Argote, and Miron-Spektor [22]. The results also provide that the integration of the information system improves the coordination level among the employees. It is because the information is transmitted at an increasingly high speed, and all the changes made can be observed by employees at various levels ensuring the information authenticity. This aspect of management information system integration has been illuminated by the study of Michálek [23], endorsing the study findings.

The decision-making of the organization is also enhanced based on the speed and accuracy of the information available at disposal. Managers in both firms use the information provided by information system integration for improving the functional capacity of the organization, as decisions related to comprehensive issues are easy to devise as compared to earlier times. These results are supplemented by Pärn, Edwards, Sing [24] which provide freedom to the managers in terms of accessing favorable information.

The results of the study provide that the integration of the study have improved the managers' decision quality. This has been endorsed by Caniëls and Bakens[25] which states that the quality information part of the firm organization system is positively associated with the decision outcomes of the managers. It highlights the direct relationship of the information quality on the manager's decisions.

The study findings agree with Delorme and Arcand[26] who reflected that the traditional role of the managers has been amplified with the integration of the information system, providing that strategic perspective of managers is more developed, which allows them to view the relative shortcomings affecting their performance. The prompt and flexibility is another aspect, which allows the promotion of the information within the firm, improving the intellectual capability. It is because the individual learns about new ways and processes[27]. Peters[28] further adds that the integration of information system supports the knowledge acquisition, its dissemination, and interpretation. The improved organization information flow benefits the organization at large as information is better shared within the organization in an efficient manner, which also allows improved knowledge management within the organization. Chen, Chiang, Storey [29] illuminate that good decisions take place when the quality data is provisioned in a timely manner, which is achieved by the integration of the information system particularly designed to cater to this need.

The monitoring potential of the organization management also increased with the system integration allowing better decision making. Such as Gabriel and Obara [30] highlight that the real time updated information entered in the data improves the firm capacity for monitoring the business operations and taking required actions. The point is further supported by Allen, Heurtebise, and Turnbull[31], who provide that this system integration is highly beneficial in situation of crisis or discovery of something new. This amplifies the firm decision-making capability. Gikang[32] provides that in the present time the slight lapse indecision at the manager's part can cause huge losses. Kuoa and Ye[33] further reveal that the employee's capacity and knowledge can better predict organizational outcomes. Positive influence of information system integration has been explored by Park et al.[34] on the overall achievement of the firm goals.

The study of Laudon and Laudon[35] further highlights that the management information system allows the head managers to craft decisions in an effective and efficient manner by declining the decision-making meetings held. The results of the present study have highlighted that with the integration of management information system, managers' capability for devising information and executing focused decision improves, adding towards the overall efficiency of the firm. The decision-making area such as workers' performances evaluation, planning budget, hiring or firing a personal are supplies in with the needed information in real time by information system integration. With respect to the study results, the study of Safford et al[36] suggests that organization must train its managers for effectual use of the information.

CONCLUSION

It has been concluded from the study that integration of the information systems in the decision making of the organization serve as a great tool for making informed and quick. Considering the dynamic nature of the healthcare and financial firm, the information at hand allows the managers to make prompt decisions. The findings of the present study confirm to the determined hypothesis that integration of the information system improves the decision-making capability of the managers in terms of speed, accuracy and ease. The outcomes of the study reveal that the use of MIS can ensure the sustainment of effective flow of information in decision-making. The study suggests that the managers at all levels must be provided with proper training for the adequate use of the information system essential for crafting better decisions. This requires the integration of management information management system for instilling coordination, and control within the managers. The study suggests that the policy makers must identify a unified set of information which enables the crafting of secure, effective and fruitful managers decisions. Along with it, the study also directs the future researches to produce a replica of the study by improving the sample size or the length of the study. Including various regions and more companies are further recommended which can assist in setting out sturdy and informed decisions at the firms improving it determined goals achievement.

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