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Forecasting the efficiency of staff based on Information Technology

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ABSTRACT

The present study has been conducted with the aim of the relationship between efficiency and IT. The statistical population included all the principals, teachers, and administrative staff of Ministry of Education in Districts 3, 5, 9 and 18 in Tehran as more than 1800 people. Among these, 160 were selected as the sample. The assessment tool in this study is the researcher-made questionnaire in which 26 multiple chose-items are used for the assessment of IT and 27 multiple choice-items for the efficiency. The findings indicate that the level of information technology and efficiency, in their overall sense, are at a high level in the community. Social networks and electronic communication components are respectively in the first and last ranks. In addition, Career Mastery and efficiency are respectively in the first and last ranks. Generally, Information Technology has no significant relationship with any of personal traits. Moreover, the overall efficiency is related to gender, place of work, age and service experience. Fundamental correlation was used with the aim of explaining the set of efficiency variables based on IT variables and personal characteristics (age, service experience). Therefore, in this study a model is introduced based on the optimized model of efficiency of the fourfold contingency model based on the information technology factors.

KEY WORDS: INFORMATION TECHNOLOGY, EFFICIENCY, EDUCATION, IT FACTOR ANALYSIS, EFFICIENCY FACTOR ANALYSIS

INTRODUCTION

Efficiency is a fundamental and important measure in Economy and is accepted as a criterion for determining the wealth of a country. And it is an important determining factor for living standard. In addition, the efficiency of countries is as an indicator for their development and backwardness. In the era of globalization, high national efficiency is the necessary condition for active role and it is achieved by producing more output with constant or less inputs. According to Toffler (2010) and Cohen (2013) and with the arrival of 21st century, the emergence of new economic is evident and a paradigm transfer takes place in each rotation and the new

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paradigm brings with itself new theory, economics, lifestyle and especial technology.

Obviously, we must follow new theories and architecture in the organizational areas. Peter Drucker pointed out that in the twentieth century, conscious activity in the field of increasing staff efficiency could increase efficiency by fifty times. He believes the same task in the twenty-first century should be based on knowledge chores and educated staff (worker knowledge). Educated employees are those who work with technology and in particular the information technology. In recent years, organizations have done the most investment on IT so that according to some estimates, over 30% of total new investments have been on information technology from 1987 to 2015.

In 2004, 484 billion dollars, equivalent to 40% of the total investments of enterprises in America, was dedicated to information processing equipment and software. Methods of information technology have changed in line with heavy investments in organizations. Personal computers do things much faster than the old Maine frames. These computers are programmed in organizations and allow their users to share thoughts, programs, files and electronic messages. Internet and doing things have provided an environment that the remote change of information in organizations goes beyond organizations and geographical boundaries.

Providing a clear picture of the relationship between efficiency and the searching ways to maximize the efficiency as the one of the priorities of organization investments on IT is been organized in developing countries. According to a recent survey conducted by McKinsey at the international level, 71 percent of senior executives believe that technological innovation has a positive impact on firms' profitability. As one of the aspects of the organization, they argue that the development of information technology can improve individual and organizational performance, especially in information processing.

According to Faramarzi (2015, p. 3), information technology directly affects on the time barrier and spread of information meaning that it leaves more time for development by reducing the time required to perform normal processes, and avoids duplication by providing a platform for information spread.In recent years, the rapid growth of information and communication technologies has had an important influence on human life and the performance of organizations and institutions in different countries.

According to experts, Lorin and Erick (as cited in Sohrabi et al., 2016), as the invention of the steam engine and the Industrial Revolution caused a shift in work and personal life of people, communications revolution has similarly caused changes in life of man. According to Chang and Cheung (as cited in Rezai, 2009), acceptance is a multidimensional phenomenon which includes a wide range of key variables some of them including perceptions, beliefs, attitudes, characteristics and extent of engagement with the IT. According to Dillon and Morris (1996), quoted by Farahbod et al. (2013), user acceptance is defined as a "demonstrable willingness among a group to use information and communication technology to perform functions that these technologies are designed to support".

According to Cheung Kong (2008), studying the literature with the development texts of the information technology curriculum in recent decades in Hong Kong indicates that the objective of curriculum in Hong Kong is the change from computer studies to create and develop the knowledge related to the information processing approaches. According to Sun and Zhang (2006), information and communication technologies have been introduced as the dominant technology in the new millennium. These technologies are as means to increase efficiency and growth in all areas of human activity with the increase of information communication process and reduction of transaction costs. In the past two decades, different theories and models are proposed, tested, modified and extended in the field of technology acceptance and the source of most of these models is from information, psychology and sociology systems. These models contribute to our understanding of the factors influencing the acceptance of technology by users and the relationships between them. Then, these models are examined in detail.

According to Lee and Kim (2009), Technology Acceptance Mode by Davis et al can be noted as one of the most widely used models in the field among different models that information technology researchers have used to explain or predict motivational factors used in technology acceptance by users. The model is based on the idea that the perception of individuals of technology affects their attitudes toward technology. This model suggests that the use of ICT is determined by the desire to behavior (desire to use) and this behavioral intention is determined by two beliefs:

1. **The mental perception of usefulness**: the extent to which a person believes that using a particular technology will improve his performance.
2. **The mental perception of the ease of use**: the extent to which a person believes that using technology will be easy for him (Yi, Jackson, Park and Probst (2006, p. 357), Walter and López (2008, p. 207)).

The use of ICT by the user in the model is the result of the function a four-step process that includes:

- Exogenous variables will affect users' ideas for using information and communication technologies.

- Users' opinions will affect their attitude in using information and communication technology.
- Users' attitude will affect their willingness to use ICT.
- The willingness of users determines their level of use of ICT (Burton-Jones and Hubona, 2006).

According to Hong, Thong and Tam (2006), technology acceptance model is based on the willingness to take that technology is a good predictor. Also, it can be used to predict user behavior before using information and communication technologies. Kuo and Yen (2009) states that willingness to accept is as mental probability of a person of doing a particular behavior which is an important factor in its actual behavior.

According to Oliveira (2002), during the 1970s, factory efficiency went up to 90-85 percents, while the performance of office work only increased 4 percent. Therefore, there was a need for systems to increase both the efficiency of factories and offices. Hence, office automation systems came into existence after the evolution of data processing systems, management information systems and supportive decision-making systems. These systems support administration offices through IT and increase their efficacy. The increased efficiency caused by the completion of information transfer and the speed and accuracy of information are between and within offices and can ultimately benefit the manager by presenting better information for decision making. The presence of information technology in organizations has improved efficiency and decision-making. Today, 50% of the capital budget costs in manufacturing organizations are spent on information technology and nearly 40 percent of the costs of re-engineering of the organizations in 1977 have been spent on information systems. Although we assume the investment on information technology coordinates organizational changes to enhance communication, the researches showing the role of information technology in such a role meticulously are few.

According to Matthew (2001), according to the necessity of the use of information technology and its development, it seems that there is a need to increase professional staff and the automation of tasks. Therefore, it is necessary for organizations to attract and retain expert staff to survive in the competition and benefit massive human resources systems in this regard. Organizations need consulting services about the financial justification of the use of information technology to prove that their rivals have gained more than the average percentage of income using ICT.

Fletcher (2013), in a study entitled as the "Staff Management in Business, Human Capital Management axis" states that if the role supportive human resources of the workforce and the management is based on business needs, using information technology will lead to improve staff efficiency.Sanjra and Gonjalez (2010) studied the role of information and communications technology in the improvement of the efficiency of teachers in primary and secondary schools and indicated that the expansion of information technology in education is beneficial for the teaching/learning process and the portion of IT is high in the betterment of teaching/learning process in schools and technology is considered as innovation. There is a need not only for the modernization of the technological devices but also for the change in the teaching models as well as the role of teacher to reach the highest level of information technology at a school.

In a study conducted by Darvish khezri and Rouhanifard (2014) in the Islamic Azad University of Gorgan as "the relationship between the use of information technology by staff and their efficiency in Islamic Azad University of Gorgan and its affiliated centers" they found that the efficiency of human resource on each eight components (motivation of human resources, innovation and creativity, spirit of competitiveness, cost reduction of activities, improving quality, reducing time work, job satisfaction and morale of the workforce) is different due to the use of technologies. In other words, there is a significant relationship between the use of information technology and human resource efficiency.

In a study conducted by Esfandiari Bayat (2013) in the city of Shiraz as "the relationship between the use of information technology by staff and organizational commitment with organizational efficiency", he concluded as follows: there is a relationship between the organizational commitment and the use of information technology by staff with efficiency and this relationship is positive and meaningful. In explaining, it can be said that the staff would have more job satisfaction in case of organizational commitment and the more the individual have commitment to the organization, the more they will be loyal to the objectives and values of the organization (emotional commitment) and there is a tendency to more trying and endeavor for beyond responsibilities.

A study conducted by Hosseinpour and Karimi Jaafar (2012) in the Markazi province entitled as "The Effect of Information and Communication Technology (ICT) on labor force efficiency in manufacturing industries of Markazi province". The aim of carrying out of this study was to investigate the effect of ICT indexes on labor force efficiency in industry of Markazi Province. Results show that ICT studies are of factors affecting labor force efficiency in the economy. Generally, by considering theoretical foundations regarding production and efficiency, the industries with a four-digit code of efficiency model are estimated using panel data method and the coefficients of the used variables in the work force

efficiency model confirm the used model. In this study, four models are estimated among which the third model was selected as the proper model of this study that follows the index of industrial enterprises that use the Internet as an indicator of ICT. The results show that information and communications technology has a positive effect on the efficiency of work force. On the other hand, human resource including the important, effective and complementary changes is for accepting the role of information technology on the efficiency of work force in Markazi province. Because whatever the workforce is more educated, they have higher ability in the implementation and acceptance of new technologies. Capital stock per capita has also a positive and significant effect on the efficiency of labor force.

In a study conducted by Sharifi, Mohammad Davoodi and Islamiyah (2012) in Tehran entitled as "The relationship between the use of information and communication technologies with the performance of teachers in the teaching-learning process", the relationship between the use of information and communications technologies with the performance of teachers in the teaching-learning process was studied. The results indicated that there is a significant relationship between the use of information and communications technologies by teachers and with their performance in the teaching-learning process and 60.6 percent of the changes of the dependant variable of the research (performance of teachers) are defined by the use of practical software, the use of databases and then the use of internet.

Also, there is no significant difference observed between the comments of participants in both components of the study (using information and communication technology and performance) in terms of teaching experience.

Accordingly, the main objective of the research is to study the effect of the use of ICT by the staff, principals and teachers of the smart schools on their efficiency.

RESEARCH METHODOLOGY

The research method in this study is descriptive and correlation-based due to the subject and the data collection method and it is applied research since the objective is to predict the criterion variables based on the predicting variables. The hypothesis presentation has not been done in this research. Then, we have only provided research questions:

First question: To what extent there is IT and each of its components in the studied population?
Second question: To what extent is the efficiency of each of its components in the studied population?
Third question: What is the ranking of IT components?
Fourth question: What is the ranking of efficiency components?
Fifth question: Is there a relationship between IT and each of its components with personal characteristics of managers?
Sixth question: do efficiency and its components have a relationship with personal characteristics of managers?
Seventh question: does IT have a relationship with efficiency?

The statistical population of the present study included all principals, teachers and administrative staff in secondary smart schools for girls in Tehran in 2015 and 2016 academic years. The statistical population is estimated as 1800 people. The sample size using Cochran formula was determined as 160 people who were selected by cluster multistage random sampling including principals, teachers and administrative staff.

RESULTS AND DISCUSSION

Cronbach's alpha coefficient has been used in this study to determine the reliability of the test. The alpha coefficient has been 0.8844 in the efficiency questionnaire and 0.8630 in IT questionnaire. Moreover, the primary output indicates that correlation matrix determinant of information technology is equal to 0.0000061 and opposite to zero and KMO in the efficiency questionnaire is equal to 0.759 showing the adequacy of sampling this study. In the study, the statistical value of Bartlett's spheral test is equal to 1780.0523 and its significance level is equal to 0.000 and the implementation of factor analysis and factor analysis is justifiable and a set of 5 factors of information technology explain 62.2 percent of the total variance of the information technology. In the next step, it is determined that the especial values for 5 factors are bigger than 1 and therefore, the questionnaire has 7 factors.

The primary output indicates that correlation matrix determinant of efficiency is equal to 0.000434 and it should be opposite to zero in order to find the invert correlation matrix and do the calculations. KMO in the efficiency questionnaire is equal to 0.755 showing the adequacy of sampling this study. Bartlett's spheral test is used in order to investigate whether the correlation matrix of the data is not zero. The purpose of this test is to reject the null hypothesis (H0). Bartlett test examines the hypothesis that the observed correlation matrix is associated to a population with uncorrelated variables. It is necessary for variables to be correlated with each

Table 1. Central and dispersion characteristics of information technology and efficiency variables in the study sample (n= 160)

Variable	Symbol	Mean	Std. deviation	Std. error	skewness	T skewness	kurtosis	T kurtosis	Min	Max	damane
Electronic empowerment	F1	3.086	0.562	0.044	-0.528	-2.73	-0.042	-0.110	1.57	4	2.43
Electronic communication	F2	2.048	0.668	0.052	0.617	3.187	-0.296	0.766	1	3.8	2.6
Electronic learning	F3	2.928	0.661	0.052	-0.200	-1.033	-0.264	0.684	1	4	3
Social network	F4	0.151	0.686	0.054	-0.729	-3.768	-0.058	-0.150	1	4	3
Electronic job	F5	2.15	0.549	0.043	0.475	2.454	0.272	0.703	1	3.8	2.8
Information technology	Ftot	2.686	0.438	0.034	-0.206	-1.066	0.968	2.500	1.21	3.73	2.52
Monitoring and reaction	B1	2.996	0.740	0.058	-0.907	-4.684	1.084	2.799	1	4	3
Organizational support	B2	2.889	0.645	0.051	-1.032	-5.331	2.170	5.603	1	4	3
Cooperation and implementation	B3	2.922	0.661	0.052	-0.924	-4.772	1.561	4.031	1	4	3
Competitiveness	B4	3.007	0.700	0.055	-0.773	-3.994	1.221	3.153	1	4	3
Practicality	B5	2.973	0.570	0.045	-0.987	-5.101	3.383	8.736	1	4	3
Performance	B6	2.797	0.739	0.058	-0.344	-1.779	0.134	0.347	1	4	3
Career Mastery	B7	3.287	0.567	0.044	-1.668	-8.615	6.031	15.572	1	4	3
Efficiency	Btot	2.983	0.483	0.038	-1.642	-8.479	7.826	20.207	1.41	3.81	2.4

Table 2. The results of one-sample t model to determine the level of information technology and efficiency in the studied population

Variable	Symbol	Mean	Std. deviation	T value	Ho	The variables level in population
Electronic empowerment	F1	3.086	0.562	13.1	rejected	Very high
Electronic communication	F2	2.048	0.668	-8.5	rejected	Very low
Electronic learning	F3	2.928	0.661	8.1	rejected	High
Social network	F4	0.151	0.686	12.01	rejected	Very high
Electronic job	F5	2.15	0.549	-8.05	rejected	Very low
Information technology	Ftot	2.686	0.438	5.3	rejected	High
Monitoring and reaction	B1	2.996	0.740	8.47	rejected	High
Organizational support	B2	2.889	0.645	7.6	rejected	High
Cooperation and implementation	B3	2.922	0.661	8.06	rejected	High
Competitiveness	B4	3.007	0.700	9.12	rejected	Very high
Practicality	B5	2.973	0.570	10.5	rejected	Very high
Performance	B6	2.797	0.739	5.09	rejected	High
Career Mastery	B7	3.287	0.567	17.5	rejected	Very high
Efficiency	Btot	2.983	0.483	12.6	rejected	Very high

Table 3. Ranking of IT (F) and efficiency (B) variables in the studied population

Variable	Sym.	Mean rank	Rank	Variable	Sym.	Mean rank	Rank
Electronic empowerment	F1	3.86	2	Social network	F4	3.97	1
Electronic communication	F2	1.64	5	Electronic job	F5	2.01	4
Electronic learning	F3	3.52	3				
Significance 0.0000		d.f. 4		Chi-square 306.9438		Cases 160	
Variable	Sym.	Mean rank	Rank	Variable	Sym.	Mean rank	Rank
Monitoring and reaction	B1	4.12	3	Practicality	B5	3.79	4
Organizational support	B2	3.53	6	Performance	B6	3.37	7
Cooperation and implementation	B3	3.77	5	Career Mastery	B7	5.28	1
Competitiveness	B4	4.13	2				
Significance 0.0000		d.f. 6		Chi-square 81.4500		Cases 160	

other; otherwise, there is no reason to explain the factor model. In this study, the statistical value of Bartlett's spheral test is equal to 1501.6582 and its significance level is less than 0.000.

Therefore, the implementation of factor analysis and factor analysis is justifiable in addition to the adequacy of sampling and a set of 5 factors of efficiency explain 52.8 percent of the total variance of the efficiency. The construct validity shows that the efficiency is able to determine 52.8 percent of the total variance of the efficiency. In the next step, it is determined that the especial values for 7 factors are bigger than 1 and therefore, the questionnaire has 7 factors.

Central and dispersion characteristics of IT and efficiency variables are determined and shown in Table 1. In response to the first and second question of the research,

Table 4. Results implementing consistent chi-square model to determine the relationship between information technology and individual characteristics of employees

Variable	Sym.	Gender	Education	Rank	Service area	Age	Experience
Electronic empowerment	F1	$X^2 = 0.96$ $\alpha=0.8$ no relationship	$X^2 = 10.44$ $\alpha=0.01$ It has a relationship	$X^2 = 0.19$ $\alpha=0.97$ no relationship	$X^2 = 19.21$ $\alpha=0.02$ It has a relationship	$X^2 = 14.48$ $\alpha=0.10$ no relationship	$X^2 = 13.57$ $\alpha=0.13$ no relationship
Electronic communication	F2	$X^2 = 2.12$ $\alpha=0.54$ no relationship	$X^2 = 1.28$ $\alpha=0.73$ no relationship	$X^2 = 2.88$ $\alpha=0.41$ no relationship	$X^2 = 6.33$ $\alpha=0.70$ no relationship	$X^2 = 10.8$ $\alpha=0.28$ no relationship	$X^2 = 1.50$ $\alpha=0.99$ no relationship
Electronic learning	F3	$X^2 = 0.75$ $\alpha=0.86$ no relationship	$X^2 = 5.22$ $\alpha=0.15$ no relationship	$X^2 = 2.53$ $\alpha=0.46$ no relationship	$X^2 = 9.54$ $\alpha=0.38$ no relationship	$X^2 = 14.82$ $\alpha=0.09$ no relationship	$X^2 = 14.7$ $\alpha=0.09$ no relationship
Social network	F4	$X^2 = 3.57$ $\alpha=0.31$ no relationship	$X^2 = 1.12$ $\alpha=0.77$ no relationship	$X^2 = 4.48$ $\alpha=0.21$ no relationship	$X^2 = 6.62$ $\alpha=0.67$ no relationship	$X^2 = 14.64$ $\alpha=0.10$ no relationship	$X^2 = 5.76$ $\alpha=0.76$ no relationship
Electronic job	F5	$X^2 = 2.42$ $\alpha=0.48$ no relationship	$X^2 = 5.43$ $\alpha=0.14$ no relationship	$X^2 = 13.41$ $\alpha=0.003$ It has a relationship	$X^2 = 22.77$ $\alpha=0.006$ It has a relationship	$X^2 = 25.04$ $\alpha=0.002$ It has a relationship	$X^2 = 18.68$ $\alpha=0.02$ It has a relationship
Information technology	Ftot	$X^2 = 0.94$ $\alpha=0.81$ no relationship	$X^2 = 4.57$ $\alpha=0.20$ no relationship	$X^2 = 1.82$ $\alpha=0.61$ no relationship	$X^2 = 9.39$ $\alpha=0.40$ no relationship	$X^2 = 9.36$ $\alpha=0.40$ no relationship	$X^2 = 7.35$ $\alpha=0.60$ no relationship

Table 5. The results of the implementation of the chi-square consistent model to determine the relationship between efficiency and personal characteristics of employees

Variable	Sym.	Gender	Education	Rank	Service area	Age	Experience
Monitoring and reaction	B1	$X^2 = 3.39$ $\alpha=0.33$ no relationship	$X^2 = 1.45$ $\alpha=0.69$ no relationship	$X^2 = 0.46$ $\alpha=0.92$ no relationship	$X^2 = 19.95$ $\alpha=0.01$ It has a relationship	$X^2 = 22.58$ $\alpha=0.007$ It has a relationship	$X^2 = 20.03$ $\alpha=0.01$ It has a relationship
Organizational support	B2	$X^2 = 4.91$ $\alpha=0.17$ no relationship	$X^2 = 2.65$ $\alpha=0.44$ no relationship	$X^2 = 3.50$ $\alpha=0.32$ no relationship	$X^2 = 13.82$ $\alpha=0.12$ no relationship	$X^2 = 23.69$ $\alpha=0.004$ It has a relationship	$X^2 = 8.01$ $\alpha=0.53$ no relationship
Cooperation and implementation	B3	$X^2 = 2.86$ $\alpha=0.41$ no relationship	$X^2 = 4.96$ $\alpha=0.17$ no relationship	$X^2 = 3.02$ $\alpha=0.38$ no relationship	$X^2 = 8.20$ $\alpha=0.51$ no relationship	$X^2 = 22.84$ $\alpha=0.006$ It has a relationship	$X^2 = 33.42$ $\alpha=0.0001$ It has a relationship
Competitiveness	B4	$X^2 = 2.45$ $\alpha=0.48$ no relationship	$X^2 = 4.65$ $\alpha=0.19$ no relationship	$X^2 = 6.44$ $\alpha=0.09$ no relationship	$X^2 = 23.87$ $\alpha=0.004$ It has a relationship	$X^2 = 32.60$ $\alpha=0.0001$ It has a relationship	$X^2 = 36.44$ $\alpha=0.0003$ It has a relationship
Practicality	B5	$X^2 = 2.56$ $\alpha=0.46$ no relationship	$X^2 = 29.36$ $\alpha=0.0001$ It has a relationship	$X^2 = 1.14$ $\alpha=0.76$ no relationship	$X^2 = 14.24$ $\alpha=0.11$ no relationship	$X^2 = 9.94$ $\alpha=0.35$ no relationship	$X^2 = 6.68$ $\alpha=0.66$ no relationship
Performance	B6	$X^2 = 6.53$ $\alpha=0.08$ no relationship	$X^2 = 3.74$ $\alpha=0.29$ no relationship	$X^2 = 3.72$ $\alpha=0.29$ no relationship	$X^2 = 18.37$ $\alpha=0.03$ It has a relationship	$X^2 = 30.49$ $\alpha=0.0003$ It has a relationship	$X^2 = 27.02$ $\alpha=0.001$ It has a relationship
Career Mastery	B7	$X^2 = 3.89$ $\alpha=0.27$ no relationship	$X^2 = 3.37$ $\alpha=0.33$ no relationship	$X^2 = 9.54$ $\alpha=0.02$ It has a relationship	$X^2 = 17.05$ $\alpha=0.04$ It has a relationship	$X^2 = 7.25$ $\alpha=0.61$ no relationship	$X^2 = 9.22$ $\alpha=0.41$ no relationship
Efficiency	Btot	$X^2 = 8.25$ $\alpha=0.04$ It has a relationship	$X^2 = 2.76$ $\alpha=0.42$ no relationship	$X^2 = 3.15$ $\alpha=0.36$ no relationship	$X^2 = 22.63$ $\alpha=0.007$ It has a relationship	$X^2 = 26.63$ $\alpha=0.001$ It has a relationship	$X^2 = 20.09$ $\alpha=0.01$ It has a relationship

the one-sample t model is been used and as table 2 shows, the efficiency components are higher than medium in the population in which the sample is extracted.

To answer the third and the fourth questions of study, Friedman's model is used and the results are shown in Table 3. As it is determined in table 3, in the studied population from the variables of information technology, social network (F4) is placed in the first rank, electronic empowerment (F1) in the second rank, electronic learning (F3) in the third rank, electronic job (F5) in the fourth rank and electronic communication (F4) in the last rank. Among efficiency variables, Career Mastery is placed at the first rank (b7), Competitiveness (B4) in the second rank, monitoring and reaction (B1) in the third rank, practicality (B5) in the fourth rank and cooperation and implementation (B3) in the fifth rank, organizational support (B2) in the sixth rank and Performance (B6) in the last rank.

According to Tables 4 and 5, a non-parametric model is used to answer fifth and sixth research questions. Table 4 shows the results of the implementation of Chi square consistent model to determine the relationship between information technologies with personal characteristics of employees.

The results in Table 4 show that electronic empowerment variable has a relationship with education at $\alpha=0.01$ lower than the Pearson (0.05) level. Moreover, electronic empowerment variable has also a relationship with service area at $\alpha=0.02$ lower than the Pearson (0.05) level. In the studied population, electronic job variable has a relationship with rank at $\alpha=0.003$ lower than the Pearson (0.05) level. Also, electronic job variable has a relationship with service area at $\alpha=0.006$ lower than the Pearson (0.05) level as well as age at $\alpha=0.002$ lower than the Pearson (0.05) level and with experience at $\alpha=0.02$ lower than the Pearson (0.05) level.

In Table 5, the results of the implementation of Chi square consistent model are presented to determine the relationship between efficiency and personal characteristics of employees.

Table 6. Consecutive Ratings significance test

Row	λ special value	fundamental correlation coefficient R_c	fundamental correlation square R_c^2	F value	df	Sig.
1	0.7870	0.663625	0.440399	5.35	49	<0.0001
2	0.5162	0.583468	0.340435	4.35	36	<0.0001
3	0.3626	0.515861	0.266112	3.40	25	<0.0001
4	0.2012	0.409249	0.167484	2.16	16	0.0057
5	0.0251	0.156482	0.024487	0.68	9	0.7292
6	0.0154	0.123181	0.015173	0.59	4	0.6715
7	0.0002	0.015094	0.000228	0.03	1	0.8526

Results of Table 5: Monitoring and reaction variable has a relationship with service area at α=0.01 lower than the Pearson (0.05) level. Monitoring and reaction variable has a relationship with age at α=0.007 lower than the Pearson (0.05) level and experience at α=0.01 lower than the Pearson (0.05) level. Organizational support variable has a relationship with age at α=0.004 lower than the Pearson (0.05) level. Cooperation and implementation variable has a relationship with age at α=0.006 lower than the Pearson (0.05) level and with experience at α=0.0001 lower than the Pearson (0.05) level. Competitiveness variable has a relationship with service area at α=0.004 lower than the Pearson (0.05) level, with age at α=0.0001 lower than the Pearson (0.05) level and with experience at α=0.0003 lower than the Pearson (0.05) level. Practicality variable has a relationship with education at α=0.0001 lower than the Pearson (0.05) level. Performance variable has a relationship with service area at α=0.03 lower than the Pearson (0.05) level and with age at α=0.003 lower than the Pearson (0.05) level and with experience at α=0.001 lower than the Pearson (0.05) level.

Career Mastery variable has a relationship with rank at α=0.02 lower than the Pearson (0.05) level and with service area at α=0.04 lower than the Pearson (0.05) level. It has a relationship with gender variable at α=0.04 lower than the Pearson (0.05) level and with service area at α=0.007 lower than the Pearson (0.05) level and with age at α=0.001 lower than the Pearson (0.05) level and with experience at α=0.01 lower than the Pearson (0.05) level.

Fundamental correlation model is used to answer the last question (does IT have a relationship with efficiency?). A summary of the fundamental correlation analysis is shown in Table 4-11.

As it can be seen in table 6, the corresponding F value with λ1= 0.7870 is equal to 5.35 which is significant for the 7*7=49 of degree of freedom at a lower level than 0.0001. F value with λ2= 0.5162 is equal to 4.35 which is significant for the (7-1) (7-1) =36 of degree of freedom at a lower level than 0.0001. The corresponding F value with λ3= 0.3626 is equal to 3.40 which is significant for the (6-1) (6-1) = 25 of degree of freedom at a lower level than 0.0001. The F value with λ4= 0.2012 is equal to 2.16 which is statistically significant for the (5-1) (5-1) = 16 of degree of freedom at α = 0.0057 but the corresponding F value is not significant for λ5, λ6 and λ7.

Based on the summary of this table, tow matrixes of the standardized coefficients are obtained of the fundamental variables (for each of the two sets that could be analyzed there is only one matrix). These values give exact information about the combination of corresponding couples with fundamental variables of table six and present them in table 7.

As Table 7 shows, the coefficients are the portion of the main variables in the combination of fundamental variables and they are usually only calculated for the fundamental correlations couples statistically significant.

R_{C12} means 0.440399 that indicates the variance ratio of ZY1 that is explained or justified by the ZX1, which means that about 44% of the ZY1 variance is explained by ZX1. R_{C22} means 0.340435 that is explained by ZX3 and R_{C32} means 0.266112 indicates the variance ratio of ZY3 that is explained by the ZX3, and R_{C42} means 0.167484 indicates the variance ratio of ZY4 that is explained by the ZX4. The relevant size of weights indicates the importance of each variable in a collection in comparison with the variables in another collection. The relevant size of this weight is the base for the definition of fundamental variables and explaining it in addition to being as its sign and each of them measures something. Structural vectors of the first to fourth factors along with the Wight are shown in table 8.

The left four columns of Table 8 figures show that four appropriate models are extracted based on four fundamental variables. Before introducing each model, it is necessary to be reminded that the age variable has a trivial and neutral effect on all four models. As experience (work) variable in the first three models, electronic

Table 7. Standardized fundamental weighting coefficients between independent (var) and dependent (with) variables

Independent variable	Sym.	V1	V2	V3	V4	V5	V6	V7
Age	Age	0.4549	-0.2359	-0.4503	0.2980	-0.7287	1.4326	-0.1690
Experience	work	-0.2178	-0.3222	0.4356	-1.0912	0.8896	-1.0063	-0.1802
Software/ hardware	F1	0.5030	-0.9339	0.5786	0.2066	-0.1443	-0.1559	-0.0651
Electronic communication	F2	0.0069	-0.0798	-0.5486	0.6534	0.8906	0.0652	0.0133
Electronic learning	F3	0.6079	0.4364	-0.5407	-0.5495	-0.4148	-0.4690	-0.5325
Social networks	F4	0.1164	0.6521	0.4125	0.0180	0.2103	0.5093	0.8665
Electronic Job	F5	-0.2304	0.2635	0.7129	-0.0743	0.0080	0.2441	-0.7383
Dependent variable	Sym.	W1	W2	W3	W4	W5	W6	W7
Monitoring and reaction	B1	-0.1405	-0.7090	0.1499	0.2291	0.9668	-0.1166	-0.5388
Organizational support	B2	0.6339	0.2558	0.7322	-0.4638	-0.0237	-0.5446	-0.5108
Cooperation and implementation	B3	0.0738	0.1796	-0.3438	0.9159	0.7325	-0.2865	-0.1894
Competitiveness	B4	-0.3374	0.5449	0.5223	0.4021	0.0609	0.5961	-0.6032
Practicality	B5	0.0757	0.6333	-0.7280	-0.0851	0.5992	-0.1802	0.1727
Performance	B6	0.2579	-0.0772	-0.4441	-0.4162	-0.3022	0.9903	-0.3120
Career Mastery	B7	0.4855	-0.5265	0.1273	0.1247	-0.1171	0.0348	0.8914

communication (F2) in the first model, and social networks (F4) in the fourth model have a trivial or neutral effect in the production or prediction of efficiency.

The efficiency of staff in an environment in which using software/hardware (F1) is high (with the coefficient of 8), the amount of electronic learning/teaching (F3) is also very high (with the coefficient of 9), the relationship with social networks (F4) is very low (with the coefficient of 1) and in the opposite, electronic Job (F5) is relatively high (with the coefficient of -4) is stated as follows: the lack of monitoring and reaction (B1) is low (with the coefficient of -1), each of the variables of organizational support (B2), Cooperation and implementation (B3), and Practicality (B5) id very low(with the coefficient of 1), and in the opposite, Competitiveness (B4) is high(with the coefficient of -5), Performance (B6) is relatively low(with the coefficient of 3) and in the last, Career Mastery (B7) is very high (with the coefficient of 9).

In the second model, if staff insist on not using software/hardware (F1) (with the coefficient of 16), the lack of electronic communication (F2) is low (with the coefficient of -1), Electronic learning (F3) is high (with the coefficient of 6), the use of social networks (F4) is very high (with the coefficient of 9), and electronic Job (F5) is relatively high (with the coefficient of 4), the efficiency of employees in these conditions will be as such: Lack of monitoring and reaction (B1) is low (with the coefficient of -1), lack of monitoring and reaction (B1) as well as inefficiency (B6) is low (with the coefficient of -1), organizational support (B2) is relatively high (with the coefficient of 4), cooperation and implementation (B3) is relatively Low (with the coefficient of 2), competitiveness (B4) and efficiency (B5), with 8 and 12 coefficients respectively are very high, and in last lack of career mastery (B7) is very large (with the coefficient of -10) are anticipated.

The third model, if staff using software/hardware (F1), the use of social networks (F4), and electronic Job (F5) are very high with the coefficients of 10, 6, and 12 respectively, and on the other hand, the lack of electronic communication (F2) and lack of electronic learning (F3) are very high (each with the coefficient of -8), the efficiency of staff is evaluated as such: monitoring and reaction (B1) and career mastery (B7) is relatively low (each with the coefficient of 2), competitiveness (B4) and organizational support (B2) and performance (B6) are very high with coefficients of 2, 12, 7 and 6 respectively, lack of cooperation and implementation (B3) is relatively low (with the coefficient of -5), and lack of practicality (B5) is very high (with the coefficient of -13).

Table 8. The coefficients of structural vectors of first to fourth along with weight factor and their weight ratios

		Fundamental structure				Fundamental weights				Weight ratios			
Independent variable	Sym.	V1	V2	V3	V4	V1	V2	V3	V4	V1	V2	V3	V4
Age	Ag	0.122	-0.333	-0.237	-0.5282	0.06813665	-0.035333655	-0.067455611	0.044634381	0	0	0	0
Experience	wk	0.027	-0.320	-0.071	-0.7618	-0.032951	-0.048738691	0.0659021116	-0.165071606	0	0	0	-1
Software/hardware	F1	0.758	-0.284	0.4508	0.3175	0.89340266	-1.658788126	1.0276806454	0.3669959192	8	-16	10	3
Electronic communication	F2	0.433	0.0097	-0.182	0.3810	0.01024246	-0.119227962	-0.82008774	0.9767728632	0	-1	-8	9
Electronic learning	F3	0.827	0.0428	-0.092	-0.0506	0.91953512	0.6601950525	-0.817876621	-0.831276451	9	6	-8	-8
Social networks	F4	0.625	0.4235	0.3567	-0.1102	0.16951815	0.9501000821	0.6009807608	0.026235686	1	9	6	0
Electronic Job	F5	0.044	0.3698	0.5139	0.1928	-0.419306	0.4795124326	1.297469579	-0.135199189	-4	4	12	-1
Dependent variable	Sym.	W1	W2	W3	W4	W1	W2	W3	W4	W1	W2	W3	W4
Monitoring and reaction	B1	0.325	-0.245	0.1042	0.5403	-0.19988637	-0.008955643	0.2133758739	0.325996724	-1	-1	2	3
Organizational support	B2	0.783	0.3418	0.4141	0.0678	1.048485066	0.4230755139	1.211132173	-0.76719553	1	4	12	-7
Cooperation and implementation	B3	0.465	0.1364	-0.132	0.7984	0.118847150	0.2893474616	-0.553908318	1.475802677	1	2	-5	14
Competitiveness	B4	0.134	0.4512	0.4659	0.4684	-0.51155043	0.8261035512	0.7918446722	0.609570296	-5	8	7	6
Practicality	B5	0.506	0.4821	-0.443	0.1353	0.145517143	0.2170621732	-1.39901473	-0.16362494	1	12	-13	-1
Performance	B6	0.588	0.0257	-0.159	0.0670	0.365309816	-0.10931526	-0.62901808	-0.58953443	3	-1	6	-5
Career Mastery	B7	0.761	-0.313	-0.012	0.2154	0.955296870	-1.35979597	0.2504985474	0.250751441	9	-10	2	2

In the fourth model, efficiency based IT variables is formed as follows: If staff are with very few experience (work) (with the coefficient of -1) in an environment with very low Electronic Job (F5) (with the coefficient of -1), using relatively high software/hardware (F1) (with the coefficient of 3), very large electronic communication (F2) (with the coefficient of 9), and lack of very high electronic learning (F3) (with the coefficient of -8), the efficiency is explained and justified as relatively high monitoring and reaction (B1) (with the coefficient of 3), very high lack of organizational support (B2) (with the coefficient of -7), very high cooperation and implementation (B3) (with the coefficient of 14), relatively high competitiveness (B4) (with the coefficient of 6), very low practicality (B5) (with the coefficient of -1), lack of good performance (B6) (with the coefficient of -5), and low career mastery (B7) (with the coefficient of 2).

In general, findings show that if the use of software/hardware and electronic learning is at very high level, the career mastery of staff will be also high. On the one hand, the heavy use of social networks is followed by the high efficiency of staff and on the other hand, the very much use of software/hardware and high electronic job are followed by high organizational support and high competitiveness. But they cause a great inefficiency and at last, high electronic communication has caused a huge increase in cooperation and implementation and in turn, the reduction of organizational support and efficiency. Thus, in this study, efficiency is introduced as an optimal model of a contingency model (four) influenced by information technology.

DISCUSSION AND CONCLUSION

Any society needs different organizations to realize its own objectives, also the correction and betterment of any organization is in line with the attention to the individuals in that society that is effective in efficiency and betterment of using organizational IT. In this regard, this study seeks to study the relationship between efficiency and IT.

In the present study, the existence of relationship between IT and efficiency was confirmed and other researches in line with this research such as: Darvish Khezri and Rouhani Fard (2014) that in their study there was a significant relationship between efficiency of work force and information technology. In the study of Esfandiari and Biat (2013), there is a relationship between organizational commitment and the amount of use of staff of the information technology with efficiency and this is a positive significant relationship. The results of Hosseinpur and Karimi Jaafari (2012) showed that ICT has a positive relationship with labor efficiency. Bozorgi (2012) has concluded that ICT and human resource efficiency are related to each other. Imani, Sharifi and Vafamanesh (2011) concluded that there is a significant relationship between using IT and the efficiency of human resource. The following researches are in line with the research results of the present study: Afsheh, Kianfar and Ali Shaeidi (2011), Faryany and Tajvidi (2011), Sanjera and Gonjalez (2010) and Kim (2009). In the present study, the convenience sample is being used, so it is necessary to generalize the results with caution.

RECOMMENDATIONS

- ✓ It is suggest conducting such studies in other areas so that the population includes a greater number of managers with a variety of individual characteristics and compared with existing research.
- ✓ The study only benefits questionnaire to gather data of the population. It is better to use other data gathering tools for the information technology and efficiency such as observation, interview and standard questionnaires as well to strengthen the research results due to the process of the research.
- ✓ It is suggested comparing the relationship between IT and efficiency in different organizations in order to strengthen efficiency theory.
- ✓ It is suggested suing the available findings based on the findings Seventh question (last) in order to strengthen the efficiency factors in the population.

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