Explanation of Factors Affecting the Promotion of Management Information Systems in the Research and Development Centers of the Nation's Banks

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ABSRTACT

There are many problems that research and development centers and organizations in decision making process face with to achieve their higher goals namely the dense information in the administrative departments, human resources information, and facilities and equipment. We investigated effective factors in improving management information systems in private banks according to five main factors of economic feasibility, operational, technical, legal and time in this research. The main objective of this study is to identify and prioritize the factors affecting the improvement of management information in the economic and financial institutions in Islamic Republic of Iran.

Keywords

Management information systems, Research and development, Promotion of economic, Operational, Technical, Legal, Time

1. INTRODUCTION

Nowadays, the use of information technology is ever-increasing. Improvements in information technology, communications, and computers allow the employees to work for their organization while they are geographically away. In other words, using these technologies, the organizations gradually move towards becoming virtual [1]. In the industrialized and developed world, information technology, as a tool in the hands of governments, can promote the governance and legitimacy of the system and increase its growth and accountability [2]. Information system is a topic that no one can provide a comprehensive definition of it. Some researchers insist on relating it to technology and consider it as a group of hardware, software, database, and other equipments [3].

The use of information systems in the age of IT in organizations can, to a great extent, help in increasing the accuracy and speed in operations, increasing the efficiency of operations, and specializing the information in different sections of an organization. In other words, it can reduce

the congestion of information in an organization. This can have considerable impact not only in one section of the organization, but at different levels (senior management, middle management, executive or operational management) [4]. Meanwhile, research and development centers also, as institutions responsible for quality and quantity planning, need immediate, correct and accurate information in order to satisfy today's requirements [5].

Certainly, improving management information systems in private banks, especially in their research and development department, can cause major changes in the planning and decision making. The main objective of this research is to study, identify, and prioritize factors affecting the improvement of management information in the economic and financial institutions. We hope the results of this study help the management in the research and development units and the improvements in this system may be regarded as important in future plans. Regarding the improvements in the information management systems, management in different areas may base their sensitive decision making on information.

2. LITERATURE REVEIW

One of the characteristics of the modern day market is the rapid changes in different aspects of the society. These changes have developed a scientific approach in all areas since the renaissance age. With respect to the current advancements in the field of microelectronics, these changes have experienced a revolution and information technology has acted as an engine for the current changes [6]. Regarding the importance and the special role information technology management plays in the improvement of the performance and efficiency of organizations, institutions, and research centers, we examine the researches in this field. Salehi shows that design and implementation of virtual education requires study of the environmental conditions, creating the necessary environment for design and implementation, recognition and reinforcement of advancement and retardant agents related to it. The results of the research indicate that design and implementation of virtual education in the institution of interest, from an economic, legal, and technical perspective, in descending order, (with means of 3.17, 3.22, and 3.35) is higher than the median, and from a technical and operational stand point (with means of 2.91 and 2.95) is lower than the median[7].

Recognizing the information needs of the senior management in the department of education in different aspects of management of the organization, Fathollahi has dealt with the issue from the stand point of three areas of human resources, information technology, and system capabilities. In addition, this study has been examined from two perspectives of classic and systemic. In the systemic section, the examination and prioritization of this information have been dealt with taking AHP (Analytical Hierarchical Process) into consideration [2]. Ketabi performed a research, analysis, and feasibility study on the creation of management information systems of information management system in the Oil Health and Treatment Organization. In this study, the researcher deals with examination and creation of management information system from a technical, operational, and economical point of view. In addition, AHP analytical prioritization of coefficients was used to determine which economical, technical, and operational factor was easier to work with. AHP analysis showed that the possibility of creating management information system was the first priority from operational, second from economical, and third from technical stand point [8].

Fallah introduced questions regarding management information system in organizations in his research. He pointed to questions to deal with the subject from the perspective of the degree of familiarity of the Physical Training Organization with management information system. Also, he pointed out that management acting in a traditional fashion, distrusted in management information system, and lacked information on management information system. One of its findings pointed to the resistance by the traditional management team towards the establishment of a management information system [9].

Henry studied design and explanation of the systematic information model and the human resources benefit system in the National Olympic Committee, selected sports federations. The results have indicated that the management information system can improve the benefits of the Physical Training Organization, whether economically or from a human resources point of view, and also accelerates the decision making process in this organization [10].

Hosseini studied three major aspects in the field of system deployment. These three aspects are: economics, technical issues, and organizational (operational) issues. According to the three assumptions, it was possible to deploy management information system in the banking system [11].

Shahrokhi performed a feasibility study on the use of information technology (internet) in reducing transportation problems and pollution in major cities [12]. Momentous has focused on design and implementation of a management information system for distributed information banks [13]. Eslami attempted to examine the decision making process and to define the role of information and information systems in this process. For this purpose, effective environments for managers' decision making are divided in two general branches: the inside organization environment, and the outside organization environment [14].

3. RESEARCH METHOD

This research, from a practical objective view point, is a sur-

vey. The data collection tool in this research was the questionnaire. The statistical population included the Iranian private banks. Morgan table has been used to determine sample size. Minimum sample size is 240 selected out of the population (600 samples).

We used simple random cluster sampling method in this research, where the top of the cluster included the private banks (including 18 banks licensed by The Central Bank) where the minimum sample population is 14 for each bank, who have been selected by simple random method.

Considering the components under examination, the primary model is as shown in Figure 1.

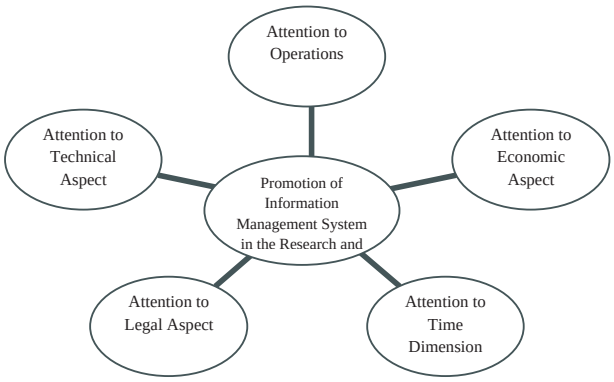

Figure 1. Significance model for research

Considering the use of Likert scale in preparing the questionnaire, it seems that for the examination of reliability the split- Half method is of a higher priority. Also, reliability of the questionnaire has been calculated by Cronbach's alpha method. The reliability used in the research is shown in Table 1.

Table 1. Reliability statistics

Cronbach›s Alpha	Part 1	Value	.945
		N of Items	14
	Part 2	Value	.896
		N of Items	14
	Total N of Items		28
Correlation Between Forms			.570
Spearman-Brown Coefficient	Equal Length		.726
	Unequal Length		.726
Guttman Split-Half Coefficient			.704

Table 1 shows that the obtained result is greater than 0.7. Therefore, the reliability of the questionnaire has been verified.

4. DATA ANALYSIS AND FINDINGS

In this section, using the appropriate statistical methods, we organized and analyzed the collected data, considering the type of variable (quantitative) and the measuring scale (relative). First, we summarized the collected information by preparing the distribution table using descriptive statistics to describe the description population variables. Using inferential statistics, the research questions were answered. We used inferential statistics section "t" tests, Pearson's correlation test for determining relations among variables, and linear regression.

Summary of Kolmogorov-Smirnov test for examining normal distribution of the data is shown in Table 2.

Table 2. One-Sample Kolmogorov-Smirnov Test

		Economic	Technical	Operation	Legal	Time
N		247	247	247	247	247
Normal Parametersa	Mean	40.22	37.90	49.38	26.06	14.02
	Std. Deviation	9.205	8.248	8.954	7.407	3.788
Most Extreme Differences	Absolute	.099	.156	.130	.167	.106
	Positive	.040	.071	.056	.167	.057
	Negative	-.099	-.156	-.130	-.123	-.106
Kolmogorov-Smirnov Z		1.555	2.450	2.044	2.619	1.666
Asymp. Sig. (2-tailed)		.141	.087	.238	.109	.063

According to Table 2, regarding the distribution of sample scores under study, their various descriptive indices indicate that the distribution of the scores of the sample group is either normal or close to normal, since the probability of significance of the variables is greater than 0.05. Therefore, the assumption of the distribution of the data being normal is accepted. Thus, we can use parametric tests to put the research hypothesis into test.

4.1. Hypotheses Testing

1st hypothesis: the condition of promotion of management information system, from an economic perspective, has a great effect in the research and development section of private banks (Table 3).

H0 = the promotion conditions have no effect in the economic aspect; $\mu = \mu_0$

H1 = the promotion conditions have an effect in the economic aspect; $\mu \neq \mu_0$

Table 3. One-Sample Statistics (1st hypothesis)

	N	Mean	Std. Deviation	Std. Error Mean
Economic perspective	247	40.22	9.205	0.586

One-Sample Test

	Test Value = 36					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Economic perspective	7.209	246	.000	4.223	3.07	5.38

Considering the fact that the value of the probability of the significance level (0.000) is smaller than the significance level (0.05), the null hypothesis is rejected with a 95% probability. More clearly, the opposite hypothesis is verified and, as a sample under study, is effective as a promotion condition in the economics aspect.

2nd hypothesis: the conditions of promotion of management information system, from technical aspect, are very effective in the research and development of private banks (Table 4).

H0 = the promotion conditions have no effect in the technical aspect; $\mu = \mu_0$

H1 = the promotion conditions have an effect in the technical aspect; $\mu \neq \mu_0$

Table 4. One-Sample Statistics (2nd hypothesis)

	N	Mean	Std. Deviation	Std. Error Mean
Technical aspect	247	37.90	8.248	.525

One-Sample Test

	Test Value = 32					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Technical aspect	11.248	246	.000	5.903	4.87	6.94

The null hypothesis is rejected with 95% probability. In other words, the opposite hypothesis has been verified and, as a sample under study, is effective as a promotion condition in the technical aspect.

3rd hypothesis: the conditions for the promotion of management information system, from operation aspect, are very effective in the research and development of private banks (Table 5).

H0 = the promotion conditions have no effect in the operation aspect; $\mu = \mu_0$

H1 = the promotion conditions have an effect in the operation; $\mu \neq \mu_0$

Table 5. One-Sample Statistics (3rd hypothesis)

	N	Mean	Std. Deviation	Std. Error Mean
Operation aspect	247	49.38	8.954	.570

One-Sample Test

	Test Value = 42					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Operation aspect	12.961	246	.000	7.385	6.26	8.51

Considering the fact that the value of the probability of the significance (0.000) is smaller than the level of significance (0.05), the null hypothesis is rejected with a 95% probability. In other words, the opposite hypothesis is verified and, as a sample under study, it is effective as a promotion condition in the operational aspect.

4th hypothesis: the conditions for the promotion of management information system, from a legal perspective, are very effective in the research and development of private banks (Table 6).

H0 = the promotion conditions have no effect in the legal aspect; $\mu = \mu 0$

H1 = the promotion conditions have an effect in the legal aspect; $\mu \neq \mu 0$

Table 6. One-Sample Statistics (4th hypothesis)

	N	Mean	Std. Deviation	Std. Error Mean
Legal perspective	247	26.06	7.407	.471

One-Sample Test

	Test Value = 21					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Legal perspective	10.730	246	.000	5.057	4.13	5.98

The null hypothesis is rejected with 95% probability, and as a sample under study, is effective as promotion condition in the legal aspect.

5th hypothesis: the conditions for the promotion of management information system, as a time dimension, have a great effect in the research and development of private banks (Table 7).

H0 = the promotion conditions have no effect in the time dimension; $\mu = \mu_0$

H1 = the promotion conditions have an effect in the time dimension; $\mu \neq \mu_0$

Table 7. One-Sample Statistics (5th hypothesis)

	N	Mean	Std. Deviation	Std. Error Mean
Time dimension	247	14.02	3.788	.241

One-Sample Test

	Test Value = 12					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Time dimension	8.399	246	.000	2.024	1.55	2.50

Considering the fact that the value of the probability of the significance (0.000) is smaller than the significance level (0.05), the null hypothesis is rejected with a 95% probability. More clearly, the opposite hypothesis is verified and, as a sample under study, it is effective as a promotion condition in the economic aspect.

6th hypothesis: there is a significant difference between the opinions of men and women in the sample under study in the area of the components being researched (Table 8, 9).

H0 = there is a difference between the opinions of men and women; $\mu \neq \mu_0$

H1 = there is no difference between the opinions of men and women; $\mu = \mu_0$

Table 8. Group Statistics (6th hypothesis)

sex	N	Mean	Std. Deviation	Std. Error Mean
men	179	167.18	26.221	1.960
women	68	168.68	26.520	3.216

Considering the fact that the value of the probability of significance (0.914) is greater than the significance level (0.05), the assumption of the equality of the variances has been rejected with a 95% probability, and the interpretation takes place with unequal variances. Therefore, in the level of inequalities among variances and considering the significance level (0.692), which is greater than significance level (0.05), the null hypothesis is verified. In other words, there is a difference between the opinions of men and women.

7th hypothesis: from an importance stand point, each of economic, technical, operational, legal, and time components have a different position (Table 10).

H0 = the importance of each research component is the same; $\mu \neq \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5$

H1 = the importance of each research component is not the same; $\mu = \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5$

Table 9. Independent Samples Test

	Levene›s Test for Equality of Variances		t-test for Equality of Means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								Lower	Upper
Equal variances assumed	.012	.914	-.400	245	.690	-1.498	3.747	-8.878	5.883
Equal variances not assumed			-.398	119.787	.692	-1.498	3.766	-8.954	5.959

Table 10. Friedman Test, Ranks

	Economic	Technical	Operation	Legal	Time	N	Chi-Square	df	Asymp. Sig.
Mean Rank	3.68	3.41	4.71	2.16	1.04	247	808.246	4	.000

Table 11. Pearson correlation

		Economic	Technical	Operational	Legal	Time
Economic	Pearson Correlation	1	.487**	.409**	.128*	.218**
	Sig. (2-tailed)		.000	.000	.045	.001
	N	247	247	247	247	247
Technical	Pearson Correlation	.487**	1	.460**	.289**	.370**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	247	247	247	247	247
Operation	Pearson Correlation	.409**	.460**	1	.373**	.341**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	247	247	247	247	247
Legal	Pearson Correlation	.128*	.289**	.373**	1	.252**
	Sig. (2-tailed)	.045	.000	.000		.000
	N	247	247	247	247	247
Time	Pearson Correlation	.218**	.370**	.341**	.252**	1
	Sig. (2-tailed)	.001	.000	.000	.000	
	N	247	247	247	247	247

Considering the fact that the value of the probability of significance (0.000) is smaller than the significance level (0.05), the null hypothesis is rejected with 95% probability. In addition, the ranking of the means related to the research components shows that the importance of each of the research components is unequal.

8th hypothesis: there is complete correlation among the main research components (economic, technical, operational, legal, and time; Table 11).

H0 = there is no correlation between any of the research components; $\mu=\mu_1=\mu_2=\mu_3=\mu_4=\mu_5$

H1 = there is a correlation between each of the research components; $\mu\neq\mu_1\neq\mu_2\neq\mu_3\neq\mu_4\neq\mu_5$

Considering the fact that the values of the probability of significance for the five research components are all smaller than the significance level (0.05), the null hypothesis is rejected with 95% probability. In other words, there is complete correlation among all research components. However, the strengths of these correlations are a little different from one another.

The Main questions of the study can be summarized as follows: What model can be presented for the promotion of management information system in the research and development sector of private banks? (Table 12).

Table 12. Variables Entered/Removed

Model	Variables Entered	Variables Removed	Method
1	Economic, technical, operation, legal, time	.	Enter

The above table indicates that the ENTER method has been used for the analysis of the data. In this method all variables are entered into the equation simultaneously.

Table 13. Regression coefficient

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.968[a]	.937	.935	.246

a. Predictors (Constant):
Economic, technical, operation, legal, time

As shown in table 13, the value of (R2 = 0.937) signifies

that 94% of the variance in the promotion of management information system is explained by improvement in performance. In other words, 94% of the distribution observed in the performance of the research and development centers of private banks is explained using MIS.

Table 14. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.410	5	.482	141.351	.007[a]
	Residual	285.015	241	1.183		
	Total	287.425	246			

a. Predictors:
(Constant):,Economic, technical, operation, legal, time

The value of (R^2 = 0.937) in table 13 is indicative of the fact that we can use the regression model for prediction. In order to know whether there is a linear relation between prediction variable (independent) and premise (dependent), F test (Also referred to as the general regression F) is used. Here F equals 141.351 (shown in Table 14). Considering the fact that a significant difference is observed here (0.05) and is much greater than the significance level 0.05, it can be said that there is a linear relation between the dependent and independent variables.

The value of F in the Table 15 showed that there is a linear relationship between the dependent and independent variables. The information shows that the beta coefficient is related to the negative legal and time aspect. By referring to the "t" statistics and the significance levels, one can judge that these two components cannot be predictors of the performance of the research and development centers of private banks. On the other hand, the value of the calculated beta in economic, technical, and operational dimensions is positive, where calculated beta in the technical dimension ranks first in effectiveness followed by operation and economic dimensions.

5. CONCLUSION

Considering a review based on theory and related statistical analysis, the following results were obtained:

Kolmogorov-Smirnov test shows that the score distribution of the sample group is normal or close to normal. Therefore, for the purpose of testing the research hypothesis, we can use parametric tests.

Considering the research hypothesis tests, the following results were obtained.

Considering hypothesis 1 to 5, the value of the probability of significance (0.000) is less than significance level (0.05) and the null hypothesis is rejected with 95% probability. More clearly, the opposite hypothesis has been verified and with regard to the sample under study, the conditions for promotion affect the aspects of (economic – technical – operation – legal – time).

In the 6th hypothesis, the assumption of inequality of variances was rejected. But at the level of inequality of variances and considering the significance level (0.692), which is greater than the significance level (0.05), the null hypothesis is verified. In other words, there is difference between the opinions of men and women.

Similarly, Rejecting the null hypothesis in the 7th and 8th hypothesis and verification of the opposite hypothesis, each of the economic, technical, operational, legal and time components have a different place, from an importance perspective.

There is complete correlation among all the components under study. The strengths of this correlation, though, are a little different. With regards to the main question of the research, the value (R2 = 0.937) is indicative of the fact that the regression model can, be used for predictions. In addition, using the "F" test, we see that there is a linear relation between the dependent and independent variables. The information shows that the beta coefficient relates to the negative legal and time dimensions. Referring to "t" statistics and the significance levels, we judge that these two components cannot be predictors of the performance

Table 15. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
1	(Constant)	3.345	.453		7.377	.000			
	economic	.069	.009	.273	.965	.000	.763	.964	.743
	technical	.057	.011	.672	.887	.000	.639	.740	.907
	operation	.034	.010	.432	.406	.000	.044	.374	.423
	legal	-.021	.010	-.002	-.030	.000	.010	-.002	-.002
	time	-.011	.020	-.007	-.041	.000	.020	-.042	-.042

of the research and development centers of private banks. On the other hand, the calculated beta is positive in the economic, technical, and operation areas, where the calculated beta in the technical dimension had the first ranking in effect followed by operations and economic.

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