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A study to determine influential factors on implementation of management information system

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CHRONICLE

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ABSTRACT

Management information system (MIS) plays an important role on sharing necessary information within organization. In this paper, we study to find out important factors influencing the implementation of MIS in banking industry. The study designs a questionnaire in Likert scale and distributes it among 253 randomly selected people. Cronbach alpha has been calculated as 0.82, which is within an acceptable limit. The study uses factor analysis to find important factors and detects six important factors including fear of technology, organizational instability, informal groups, cultural factors, organizational development and understanding that change is always good.

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1. Introduction

During the past few years, there have been growing interests in implementation of management information system (MIS) in various organizations. However, any MIS implementation may face various challenges such as lack of cooperation from human resource management, complexity in system integration, etc. (Mahmood et al., 1995; Lederer & Hannu, 1996; Moshref Javadi & Delshad Dastjerdia, 2011). There are different studies to detect important factors as barriers for MIS implementation. Véronneau and Cimon (2007) examined how to keep robust and effective decision capabilities for firms involved in critical operations using an integrated MIS. They proposed an integrative and cumulative view that was articulated threefold. First, they presented an operations resource management and suggested an integrative approach for decision capabilities as they rest on the interaction between humans and systems. Finally, they derived a decision model and demonstrated that careful consideration could be given to the interplay among humans, systems, and the environment in which they operate.

Renzl (2008) discussed trust in management and knowledge sharing by looking into the mediating effects of fear and knowledge documentation. Rom and Rohde (2007) performed a comprehensive

*Corresponding author. E-mail address: dr.naserazad@yahoo.com (N. Azad) review on management accounting and integrated information systems. Some experts believe that MIS implementation in any kind of business model may create different risk in the system and we need to control the risk to prevent any possible damages. Bojanc and Jerman-Blažič (2008), for instance, presented an economic modelling approach to information security risk management. Nevertheless, any MIS implementation has been accompanied by appropriate action plans (Gottschalk, 1999). Factor analysis has been used in banking industry for detecting important factors. Azad and Hassanabadi (2013), for instance, presented an empirical investigation on factors influencing on brand loyalty. In this paper, we present another empirical investigation to find important factors influencing MIS adaptation in banking industry.

2. The proposed method

The proposed model of this paper uses factor analysis to determine important factors influencing MIS adaptation in banking industry. The study designs a questionnaire consists of 28 questions and in Likert scale. The study is performed among all existing employees of one of Iranian banks named Bank Eghtesad Novin in city of Tehran, Iran and the sample size is calculated as follows,

$$n = \frac{N \times z_{\alpha/2}^2 \times p \times q}{\varepsilon^2 \times (N-1) + z_{\alpha/2}^2 \times p \times q},\tag{1}$$

where N is the population size, p=1-q represents the yes/no categories, $z_{\alpha/2}$ is CDF of normal distribution and finally ε is the error term. Since we have $p=0.5, z_{\alpha/2}=1.96$ and N=2600, the number of sample size is calculated as n=253. Cronbach alpha has been calculated as 0.82, which is within an acceptable limit. In addition, Kaiser-Meyer-Olkin Measure of Sampling Adequacy is calculated as 0.742, which is within an acceptable limit and validates the results. Since factor analysis is sensitive on skewness of factors, we have decided to delete seven questions. Fig. 1 demonstrates Scree plot on questions of the survey. In addition, Table 1 shows details of principles component analysis before and after rotation

Scree Plot

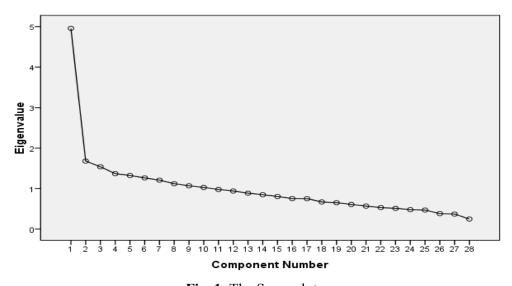


Fig. 1. The Scree plot

0.721

Table 1The results of principal component analysis with 10 extracted factors

The results of principal component ana	,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	1					5	6	7	0	9	10
T (1)	**** D 0 0 0 0 4	502	2	3	4		5	6	/	8	9	10
Fear of how to use new systems	VAR00024	.583				244						
Conflicts with existing norms	VAR00011 VAR00023					.344						
Fear of losing cooperation with others				39	6							
Complexity of new systems	VAR00026			39	o							
Replacing vague system with a determine one	VAR00007 VAR00028											
Lack of cooperation from other people	VAR00028 VAR00025			43	0	.339						
Feeling uncomfortable of using new system	VAR00023 VAR00022			43	9	.339						
Fear of losing job	VAR00022 VAR00020										.350	
Need for more knowledge Fear of losing personal advantage	VAR00020 VAR00015					367					.330	365
Lack of economic stability	VAR00013					307			.336			303
· ·	VAR00021 VAR00002						.380	341	.330			
Feeling that MIS is unnecessary	VAR00002 VAR00017		.331				.360	541	.386			
Change in rules and regulations	VAR00017 VAR00005		.331				225		.380			222
Pressure from others to accept MIS	VAR00003 VAR00006						335					.333
Having more risk within organization Fear of losing independence	VAR00006 VAR00027			40	n		.344				378	
			672	40	J						3/6	
Conflict with group interest General culture of having change in organization	VAR00019 VAR00018	.44/	.673			.389						
Having different informal groups	VAR00018 VAR00004	202	.580	.482		.509						
Fear of losing control of job	VAR00004 VAR00014			.482		451						
	VAR00014 VAR00001	.394			٠.	+31	.469				.428	
Feeling of wasting too much time to have new MIS system Change in job responsibilities	VAR00001 VAR00010	277					.396				.428	.333
Fear of expecting difficult task	VAR00010 VAR00012	.311					.390	.524				.333
Change in habits	VAR00012 VAR00003	264						.324	433			
	VAR00009	.383		.367					394			
Change in budgeting system Fear of new training programs	VAR00009 VAR00013	.363		.307					394	.469		
Fear of losing job security	VAR00013	.415								419		
Organizational structure	VAR00008 VAR00016		.358							417		.560
Principle component analysis after rota			1	2	3	4	5	6	7	8	9	10
Feeling uncomfortable of using new system	VAR00025	.621						.381				
Fear of how to use new systems	VAR00024	.608										
Complexity of new systems	VAR00026	.581										
Fear of losing independence												
	VAR00027	.538										
Change in habits	VAR00003	.532										
Fear of losing job	VAR00003 VAR00022		.									
Fear of losing job Having more risk within organization	VAR00003 VAR00022 VAR00006	.532	! !	.614								
Fear of losing job Having more risk within organization Replacing vague system with a determine one	VAR00003 VAR00022 VAR00006 VAR00007	.532		.571								
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities	VAR00003 VAR00022 VAR00006 VAR00007 VAR00010	.532	!	.571 .530	70 6				.371			0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system	VAR00003 VAR00022 VAR00006 VAR00007 VAR00010 VAR00009	.532	!	.571 .530 .529	.506				.371			0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others	VAR00003 VAR00022 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023	.532	!	.571 .530 .529	.601				.371			0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others Having different informal groups	VAR00003 VAR00022 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023 VAR00004	.532	!	.571 .530 .529	.601				.371			0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others Having different informal groups Pressure from others to accept MIS	VAR00003 VAR00022 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023 VAR00004 VAR00005	.532	!	.571 .530 .529	.601			.337	.371			0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others Having different informal groups Pressure from others to accept MIS Fear of losing personal advantage	VAR00003 VAR00022 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023 VAR00004 VAR00005 VAR00015	.532	!	.571 .530 .529	.601	.741		.337	.371			0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others Having different informal groups Pressure from others to accept MIS Fear of losing personal advantage Fear of losing control of job	VAR00003 VAR00022 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023 VAR00004 VAR00005 VAR00015 VAR00014	.532	!	.571 .530 .529	.601	.741	.	.337	.371			0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others Having different informal groups Pressure from others to accept MIS Fear of losing personal advantage Fear of losing control of job General culture of having change in organization	VAR00003 VAR00022 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023 VAR00004 VAR00005 VAR00015 VAR00014 VAR00018	.532	!	.571 .530 .529	.601		.879	.337	.371			0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others Having different informal groups Pressure from others to accept MIS Fear of losing personal advantage Fear of losing control of job General culture of having change in organization Conflict with group interest	VAR00003 VAR00022 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023 VAR00004 VAR00005 VAR00015 VAR00014 VAR00018 VAR00019	.532	!	.571 .530 .529	.601		.		.371			0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others Having different informal groups Pressure from others to accept MIS Fear of losing personal advantage Fear of losing control of job General culture of having change in organization Conflict with group interest Lack of economic stability	VAR00003 VAR00022 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023 VAR00004 VAR00005 VAR00015 VAR00014 VAR00018 VAR00019 VAR00021	.532	!	.571 .530 .529	.601		.879	.758	.371			0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others Having different informal groups Pressure from others to accept MIS Fear of losing personal advantage Fear of losing control of job General culture of having change in organization Conflict with group interest Lack of economic stability Conflicts with existing norms	VAR00003 VAR00002 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023 VAR00004 VAR00005 VAR00015 VAR00014 VAR00018 VAR00019 VAR00021 VAR00011	.532	!	.571 .530 .529	.601		.879					0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others Having different informal groups Pressure from others to accept MIS Fear of losing personal advantage Fear of losing control of job General culture of having change in organization Conflict with group interest Lack of economic stability Conflicts with existing norms Organizational structure	VAR00003 VAR00022 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023 VAR00004 VAR00015 VAR00015 VAR00014 VAR00018 VAR00019 VAR00021 VAR00011 VAR00016	.532	!	.571 .530 .529	.601		.879	.758 .571	.735			0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others Having different informal groups Pressure from others to accept MIS Fear of losing personal advantage Fear of losing control of job General culture of having change in organization Conflict with group interest Lack of economic stability Conflicts with existing norms Organizational structure Change in rules and regulations	VAR00003 VAR00002 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023 VAR00004 VAR00015 VAR00015 VAR00014 VAR00018 VAR00019 VAR00021 VAR00011 VAR00016 VAR00017	.532	!	.571 .530 .529	.601	.704	.879	.758	.735			0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others Having different informal groups Pressure from others to accept MIS Fear of losing personal advantage Fear of losing control of job General culture of having change in organization Conflict with group interest Lack of economic stability Conflicts with existing norms Organizational structure Change in rules and regulations Lack of cooperation from other people	VAR00003 VAR00002 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023 VAR00004 VAR00015 VAR00015 VAR00014 VAR00018 VAR00019 VAR00021 VAR00011 VAR00016 VAR00017 VAR000228	.532	!	.571 .530 .529	.601		.879	.758 .571	.735			0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others Having different informal groups Pressure from others to accept MIS Fear of losing personal advantage Fear of losing control of job General culture of having change in organization Conflict with group interest Lack of economic stability Conflicts with existing norms Organizational structure Change in rules and regulations Lack of cooperation from other people Feeling of wasting too much time to have new MIS system	VAR00003 VAR00002 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023 VAR00004 VAR00015 VAR00015 VAR00014 VAR00018 VAR00019 VAR00021 VAR00011 VAR00016 VAR00017 VAR00028 VAR00001	.532	!	.571 .530 .529	.601	.704	.879	.758 .571	.735	.685		0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others Having different informal groups Pressure from others to accept MIS Fear of losing personal advantage Fear of losing control of job General culture of having change in organization Conflict with group interest Lack of economic stability Conflicts with existing norms Organizational structure Change in rules and regulations Lack of cooperation from other people Feeling of wasting too much time to have new MIS system Need for more knowledge	VAR00003 VAR00022 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023 VAR00004 VAR00015 VAR00015 VAR00014 VAR00018 VAR00019 VAR00021 VAR00011 VAR00016 VAR00017 VAR00028 VAR00001 VAR000010 VAR000010 VAR000010	.532		.571 .530 .529	.601	.704	.879	.758 .571	.735	.673		0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others Having different informal groups Pressure from others to accept MIS Fear of losing personal advantage Fear of losing control of job General culture of having change in organization Conflict with group interest Lack of economic stability Conflicts with existing norms Organizational structure Change in rules and regulations Lack of cooperation from other people Feeling of wasting too much time to have new MIS system Need for more knowledge Feeling that MIS is unnecessary	VAR00003 VAR00022 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023 VAR00004 VAR00015 VAR00014 VAR00018 VAR00019 VAR00021 VAR00011 VAR00016 VAR00017 VAR00028 VAR00001 VAR00020 VAR00002	.532		.571 .530 .529	.601	.704	.879	.758 .571	.735			0.395
Fear of losing job Having more risk within organization Replacing vague system with a determine one Change in job responsibilities Change in budgeting system Fear of losing cooperation with others Having different informal groups Pressure from others to accept MIS Fear of losing personal advantage Fear of losing control of job General culture of having change in organization Conflict with group interest Lack of economic stability Conflicts with existing norms Organizational structure Change in rules and regulations Lack of cooperation from other people Feeling of wasting too much time to have new MIS system Need for more knowledge	VAR00003 VAR00022 VAR00006 VAR00007 VAR00010 VAR00009 VAR00023 VAR00004 VAR00015 VAR00015 VAR00014 VAR00018 VAR00019 VAR00021 VAR00011 VAR00016 VAR00017 VAR00028 VAR00001 VAR000010 VAR000010 VAR000010	.532		.571 .530 .529	.601	.704	.879	.758 .571	.735	.673	.747	0.395

VAR00008

Fear of losing job security

Based on the results of Table 2 we detect six important factors including fear of technology, organizational instability, informal groups, cultural factors, organizational development and understanding that change is always good.

3. The results

In this section, we explain details of our finding on six factors.

3.1. The first factor: Fear of technology

The first factor, fear of technology, consists of six sub-factors, which are summarized in Table 2.

Table 2The results of factors associated with fear of technology

	0,			
Option	Factor weight	Eigenvalues	% of variance	Accumulated
Change in working habit	0.63			
Fear of losing job	0.524			
Fear of how to use the system	0.64			
Feeling uncomfortable of using the new system	0.646			
Complexity of new systems	0.69	1.326	26.512	26.512
Fear of losing independence	0.585			

Cronbach alpha =0.573

As we can observe from the results of Table 2, complexity of new system is blamed the most as a barrier of MIS implementation in this category followed by feeling uncomfortable and fear of how to use the system.

3.2. The second factor: Instability in organization

The second factor, instability in organization, consists of four sub-factors summarized in Table 3.

Table 3The results of factors associated with instability in organization

Option	Factor weight	Eigenvalues	% of variance	Accumulated
Entering too much risk in organization	0.709			
Replacing uncertainty with certainty	0.854	1.640	54.675	54.675
Change in responsibilities	0.684			
Change in budging methods	0.758			

Cronbach alpha =0.75

According to Table 3, replacing uncertainty with certainty is the most important issue as a barrier of MIS implementation in this category followed by change in budgeting method.

3.3. The third factor: Informal groups

The third factor, informal group, consists of three sub-factors, which are summarized in Table 4 as follows,

Table 4The results of factors associated with informal groups

Option	Factor weight	Eigenvalues	% of variance	Accumulated
Existence of various informal groups	0.719			
Pressure from group for accepting changes	0.729			
Fear of losing cooperation with colleagues	0.827	1.857	61.916	61.916

Cronbach alpha =0.65

As we can observe from the results of Table 4, fear of losing cooperation with colleagues is the most important issue as a barrier of MIS implementation in this category followed by pressure from group for accepting changes.

3.4. The fourth factor: Cultural factors

The fourth factor, informal group, consists of two sub-factors, which are summarized in Table 5 as follows,

Table 5The results of factors associated with cultural factors

Option	Factor weight	Eigenvalues	% of variance	Accumulated
General culture of accepting changes	0.690	1.652	55.082	55.082
Conflict with existing norms	0.636			

Cronbach alpha =0.68

As we can observe from the results of Table 5, general culture of accepting changes is the most important issue as a barrier of MIS implementation in this category followed by conflict with existing norms.

3.5. The fifth factor: Organizational change

The fifth factor, organizational change, consists of three sub-factors, which are summarized in Table 6 as follows,

Table 6The results of factors associated with organizational change

Option	Factor weight	Eigenvalues	% of variance	Accumulated
Organizational structure	0.674			
Change in rules and regulations	0.621			
Lack of cooperation	0.733	1.479	36.972	36.972

Cronbach alpha =0.64

As we can observe from the results of Table 6, lack of cooperation is the most important issue as a barrier of MIS implementation in this category followed by organizational structure.

3.6. The sixth factor: Perception of benefit of having change

The last factor, perception of benefit of having change, consists of three sub-factors, which are summarized in Table 7 as follows,

Table 7The results of factors associated with perception of benefit of having change

Option	Factor weight	Eigenvalues	% of variance	Accumulated
Feeling that the new system is unnecessary	0.674			
Implementation of MIS is a matter of wasting time	0.621			
Feeling needs for learning more	0.733	1.479	36.972	36.972

Cronbach alpha =0.61

As we can observe from the results of Table 7, feeling needs for learning more is the most important issue as a barrier of MIS implementation in this category followed by feeling that the new system is redundant.

4. Conclusion

In this paper, we have presented an empirical investigation to find important factors influencing implementation of management information system in banking systems. The study designed a questionnaire and distributed it among some experts and, using principle component analysis, we have extracted six factors including fear of technology, organizational instability, informal groups, cultural factors, organizational development and understanding that change is always good.

The first factor, fear of technology, consists of six sub-factors where complexity of new system is blamed the most as a barrier of MIS implementation in this category followed by feeling uncomfortable and fear of how to use the system. The second factor, instability in organization, consists of four sub-factors where replacing uncertainty with certainty is the most important issue as a barrier of MIS implementation in this category followed by change in budgeting method. The third factor, informal group, consists of three sub-factors, where fear of losing cooperation with colleagues is the most important issue as a barrier of MIS implementation in this category followed by pressure from group for accepting changes. The fourth factor, informal group, consists of two sub-factors, , general culture of accepting changes is the most important issue as a barrier of MIS implementation in this category followed by conflict with existing norms. The fifth factor, organizational change, consists of three sub-factors, where, lack of cooperation is the most important issue as a barrier of MIS implementation in this category followed by organizational structure. Finally, the last factor, perception of benefit of having change, consists of three sub-factors, where feeling needs for learning more is the most important issue as a barrier of MIS implementation in this category followed by feeling that the new system is redundant.

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