

## **Prioritizing and Assessment of the Relationships between Factors Affecting Underdevelopment of Electronic Banking in Iran (a Study with Fuzzy DEMATEL Approach)**

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Banks, in order to extend the development of information technology and electronic banking services and its using by customers, in first place, should examine barriers and problems in using information technology. Therefore, in this study we deal with identifying and prioritizing these barriers in Iranian banks. Our method in this research is descriptive-survey. In this way, after the library study and the extraction of factors and problems facing the information technology, common indexes is extracted by Delphi approach, which is classified in 8 categories and led to 17 indexes. Then, by helping the fuzzy DEMATEL approach we prioritize these indexes. By using MATLAB software the affecting and the affected factors was analyzed. The results show that the affecting factors on development of electronic banking include society culture of acceptance, lack of public awareness, the field of communications, strong culture of organization, managers' acquaintance with technology, strong regulations to deal with cyber criminals, recruitment of skilled human resources and coordination in the adoption of field of policies in the of technology. Also the affected factors of development of electronic banking include existence of centers of various decision making in technology, development and being adequate networks, individuals' continuous training, managers planning about promotion and maintenance of systems, existence of modern hardware and software, system monitoring and safety, required standards in information resources, lack of deficiency in accuracy and being up to date the information and information resources. They all are affecting from other factors in electronic banking development.

**Keywords:** Electronic Banking, Affecting and Affected indexes, Information Technology, Delphi Technique, Fuzzy DEMATEL

**JEL Classification:** C44, G210

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## **1 Introduction**

Development and use of information technology in various fields, particularly in the areas of banking, is a result of the capabilities of information technology that is faced with great enthusiasm in the today's business world. Third millennium human is trying to distance from the traditional model and create a new pattern, which fits with the requirements of the information age, by accelerating the development process and information technology using in different parts of the social system. In this regard, and like the majority of service providers, banking system, during the recent decades, has rapidly turned to invest on new technologies to provide services to clients, as a way to control costs, attract new customers and achieve customer expectations and put the use of these technologies (Internet banking, telephone banking, ATM machines, etc.) on its agenda, as a strategic necessity (Mattila, Karjaluoto, Pentto, 2003).

Parallel to the increasing developments in the world, customers' expectations rate from banking network has grown. So all customers wanted high quality services, increase the speed of banking operations and pay particular attention of staff to themselves. To achieve the above objectives, undoubtedly, banks and customers should be able to use information technology. But there are obstacles in the way of the development of information technology to achieve electronic banking. In this study, we first tried to identify the factors using the Delphi approach, and then, to prioritize factors, according to their affecting and influencing on management and development of electronic banking. In this research, after the introduction, we will highlight the importance of the topic and literature of research. In the third part, we present the research method, the statistical population, the method of data collection and implementation of the research method steps and in the fourth section, we will find the findings of the research. In the final section we explain the final results and suggestions.

## **2 Literature review**

Electronic banking is the provision of financial and banking services through the Internet and electronic network, which has attracted a lot of attention as one of the most important e-commerce infrastructure and many researchers have spent time on the foundations of electronic banking development. Electronic banking has been unprecedented in recent years and there is no doubt that in order to enter the global markets and membership in the World

Trade Organization, it is necessary to have an efficient banking system that can compete with the world's banks with precision, speed and technology.

In electronic banking, significant advances have taken place in Iran, but the use of new technologies has not yet changed the business of banks. Financial intermediation, which forms the core of the banking system's activity, has not yet been tangibly affected by these processes. Perhaps there is a need for lawmakers and senior executives of the banking system to take a different approach to "technology" and not only see it as a tool, but also as a driver for the evolution of the new business model. Therefore, in order to institutionalize new technologies in the banking system and change the structure in the banking business approach, it is necessary to provide the necessary framework for the symmetric and immersive development of this important issue. Certainly, the traditional banking model will no longer meet the growing needs of customers in the banking system. Hence, e-banking development should be followed by the definition of various patterns of banking business. Patterns that are consistent with international trends and standards of Islamic banking, along with profitability. Developing a few tools, as well as improving quality, standardizing, improving service security and redefining the banking business model, can provide a unique opportunity to grow the banking industry, increase access to financial services, reduce costs and increase the efficiency of banking operations. And this is only possible in the light of the shift in policy makers, bankers, and e-banking actors. Also, reducing sanctions and providing a suitable platform for interacting with international banking will require the banking system. A look at the statistics shows that Iran has a very small share in the international banking system. On the other hand, the operational presence of banks and financial institutions in foreign countries indicates the financial development of a country and for joining the global financial network, having a strong banking system is essential, A banking system that can enter the markets with day-ahead technology and with advanced banks. Therefore, in order to enter the global e-commerce platform, the development of electronic banking is one of the most important parts of the country that should move along with this move. Also, the lack of communication and interaction of the country's banking system with the international banking system has led to the failure of the country's electronic banking to be in line with global developments in this regard. Therefore, the process of banking system re-creation and improvement of effective international presence areas and attention to important areas such as the development of integrated banking models and standardization of banking processes, social banking, integration, development and modernization of

comprehensive information system, promotion of security systems, And the pivotal worker should be pursued with more effort. The desirable situation in electronic banking is imperative that the integration, development and modernization of the comprehensive information system, with the benefit of the technologies, as outlined in the map of the Central Bank on the horizon of 1400 (2021AD), should be pursued with firm determination.

Table 1

*A Summary of the Literature*

Researcher	The result of research
Atashak and Mahzadh (2008)	One of the instruments necessary to increase business efficiency in the national economy by taking advantage of information technology, that the provision of infrastructure is necessary to achieve this important.
Hassan Rahgoshay	12 barriers to the development of information technology has been identified
Ali Sanaye'i and et al (2013)	In a research, three factors of cultural-social, economic, security and trust, had been identified, as barriers to the development of electronic banking in the government banks in Isfahan.
Hadi Seifi (2008)	The advancement of electronic banking has been accompanied by building culture, customer satisfaction and improvement the quality of banking services in Tehran's Mellat Bank Branches.
Harsini (2006)	The principle of the application of quality management and IT in management team enables organization in the organization management.
Giti Jahanbakhsh (2008)	IT increases the information transparency, improving accountability in the bank, improving employee communication with clients and client awareness of banking regulations, which will result in the development of electronic banking.
David Kanoselly (2005)	In the evolution of retail banking in an perspective from 1840 to 1990, distribution of innovation processes in infrastructures has the most important role.
Beccalli (2006)	In a study of 737 European banks it has been observed, that investing in hardware and software will not merely lead to profit, but external services such as consulting, education and building culture, and IT support services, have a positive impact on profitability.
Jahanbakhsh (2008)	IT increases the information transparency, improving accountability in the bank, improving employee communication with clients and client awareness of banking regulations, which will result in the development of electronic banking.
Multimedia University (2004)	Development of communication and telecommunication technologies has been introduced as a mutation a major change factor in banking sector in Malaysia.
Mypdank et al (2009)	IT is not only as a supporting factor in providing banking services, it also is a profitable factor, which its necessity is that the bank managers should pay particular attention to this category of IT.

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Agbola (2005)	Information technology acceptance by the public is an important factor in the development of electronic banking in Nigeria
Osho Gvlahan S. (2008)	Customers' tendency to use information technology and parsimonious selections in time has caused banks' profitability.
Mohammad Atashak and Parisa Mahzadh (2008)	One of the instruments necessary to increase business efficiency in the national economy by taking advantage of information technology, that the provision of infrastructure is necessary to achieve this important.
Agboola (2008)	Information technology acceptance by the public is an important factor in the development of electronic banking in Nigeria
Mypdank et al (2009)	IT is not only as a supporting factor in providing banking services, it also is a profitable factor, which its necessity is that the bank managers should pay particular attention to this category of IT.
Teo et al (2009)	The suitability of software and the ability to provide and support e-banking systems, management stability during the development and implementation of e-banking
Rabi et al (2011)	Non-interference in policies, implementation and supervision in the field of e-banking, the appropriateness of the indicators set up for e-banking, the change of remuneration system to management of e-banking processes.
Zaied, (2012)	Planning for Customer Education, Customer Access to Electronic Services, Independence of Electronic Banking Systems, Macroeconomics Senior Managers
Nasri et al (2012)	The suitability of the infrastructure, the appropriateness of hardware and software, the presence of expert and expert, the suitability of the quality level of knowledge of specialists, the security of the information exchange space, the coordination and spirit of the workgroup in the projects, the organizational structure change.
Ali Sanaye'i and et al (2013)	In a research, three factors of cultural-social, economic, security and trust, had been identified, as barriers to the development of electronic banking in the government banks in Isfahan.

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*Source:* research findings.

Despite enormous investments, which have made in the application field of information technology in the banking sector, reports indicated that some users do not use technology, regardless of access to it. This issue reveals the requirement to conduct research to identify factors determining the adoption of electronic banking by users. Recent literature shows that various researchers have been evaluated the identifying the problems of developing information technology for electronic services. In Table 1, a summary of the conducted researches in this regard are presented.

As it can be seen, none of the above studies have been conducted with the aim of identifying factors affecting the development of electronic banking, and more importantly, with the aim of prioritization of these factors. By combining qualitative and quantitative methods, in addition of identifying the

factors affecting the development of electronic banking in Iran, in this study, for the first time, it is tried to measure their interactions with the application of fuzzy logic and determine the most influential factors. Therefore, the investigation of the relationship between the factors affecting the development of electronic banking, also need an accurate and comprehensive method. DEMATEL technique is a comprehensive approach for manufacturing and processing a model, which is able to analyze the structure and the interactions between system components. Involving indirect communication (in addition to the direct connection) between the components in a causal model is the main advantage of this method, according to that, the prioritization of components based on the type of communication and severity of their impact on each other is possible (Beccalli, 2007).

### 3 The research method:

This research is an applied study in terms of purpose, and a descriptive-survey study in terms of method. It consists of two main steps are as follows: The first step: to identify the problems of information technology in the development of electronic banking, Delphi approach is used (Ahmadi, 2010). At this step, by using the Delphi method, it has been asked from a group of experts to list the factors they considered to be part of the problem in the way of the development of electronic banking. In the first round, 55 general and partial indexes were identified and classified, and in continuing, to reduce indexes by five options Likert scale, whole indexes have been provided to experts to reconsider the effect of each variable. To each of the responses (very high, high, medium, low and very low) scores 9, 7, 5, 3 and 1 were given respectively. The mean score of respondents is equal or less than seventy-five percent of the highest score belonged to each variable. The hypothesis one is also raised as the mean is larger than the number of 6.75. In fact the null and the alternative hypothesis have been stated as below:

$$\begin{cases} H_0 = \bar{X} \leq 6.75 \\ H_1 = \bar{X} > 6.75 \end{cases} \quad (1)$$

To test these hypotheses, SPSS software and test of the difference between the mean of a society with an identified number that its variance is unknown (one sample t test) were used.

$$t = \frac{\bar{X} - \mu}{\frac{s}{\sqrt{n}}} \tag{2}$$

**Table 2**  
*Identified Detailed Variables and Their Classification*

Dimensions	Symbol	Index	Dimensions	Symbol	Index
Infrastructure	C1	Existence of modern hardware and Software	Culture	C9	Culture of the society in adoption of IT
	C2	Expansion networks and being adequate the number of them		C10	Lack of public awareness from the IT services
	C3	Existence of the field of Telecommunications		C11	Strong culture of the organization
Human Resources	C4	Human resources recruitment and programmers with experience in IT field	Rules and Regulations	C12	Existence of several centers of decision-making in IT
	C5	Continuing education in the field of IT		C13	Existence of strong laws to deal with cyber criminals
Financial resources	C6	Care and Safety of Systems	Comprehensive policies of the organization	C14	Coordination in the organization policies in the field of IT
Management	C7	Acquaintance of the managers with IT	Information Resources	C15	Necessary standards in information sources
	C8	Managers' planning for the promotion and maintenance of IT systems		C16	Lack of information resources
				C17	Being accurate and up to date information of information resources

*Source:* research findings.

After the statistical test, for 27 cases, it is obtained that  $P > 0.05$ . Thus these variables were excluded, with this inference, that their impact on the development of electronic banking is not statistically significant. Finally, by combining some of the variables, 17 remaining variables have been grouped and identified conceptually.

Second step: to determine the interactions of factors, which in the following, besides the explanation of fuzzy DEMATEL method, we will define the interaction factors.

### 3.1 Fuzzy DEMATEL method

The DEMATEL technique that is presented, for the first time, by American scientists in the years 1926 to 1972, was the method for complex problems. This technique was made based on graph theory that was able to solve problems with simple methods, but there is a defect for the DEMATEL technique. The decision making under uncertainty will lead to the fuzzy DEMATEL technique. Fuzzy DEMATEL method using fuzzy linguistic variables makes decision making under conditions of environmental uncertainty easy (Shieh, Wu, Huang, 2010). Furthermore, this technique can make resolve all the problems facing organizations, by using group decision-making, in fuzzy conditions (Taghizadeh Herat, Noorossana, Parsa, 2012). The steps of this technique are as follows:

The first step: designing fuzzy linguistic criteria:

In this step we need to determine the criteria for decision making. To resolve the uncertainty, we should provide these criteria to decision makers according to linguistic criteria (Table 3), and compare the criteria with each other, with regard to these criteria (Taghizadeh Herat et al, 2012).

Table 3

#### *Corresponding Relationship between Language and Fuzzy Number.*

Corresponding triangular fuzzy number	Real numbers	Linguistic judgments
(0.75, 1, 1)	4	Very high influence
(0.5, 0.75, 1)	3	High influence
(0.25, 0.5, 0.75)	2	Low influence
(0, 0.25, 0.5)	1	Very low influence
(0, 0, 0.25)	0	No influence

Source: research findings.

The second step, making the poll of the respondents:

In this step it is asked from each respondent, based on Table (3), to attempt to determine the effect of each criterion to the other criteria. The symbol  $\tilde{O}_{ij} = (l_{ij}, m_{ij}, u_{ij})$  represents the respondent's opinion about the effect of factor  $i$  on factor  $j$ . Zeros are set in matrix for each  $i = j$ . For each respondent a  $n \times n$  matrix is defined as  $\tilde{O}^p = [\tilde{O}_{ij}^p]$ , which should has fuzzy elements. Where  $p$  is

the number of respondent and n is the numbers of factors. Therefore we will have matrixes of p respondents,  $\tilde{O}^1, \tilde{O}^2, \tilde{O}^3, \dots, \tilde{O}^p$  (Shieh et al, 2010).

The third step: making an initial decision making matrix ( $\tilde{O}$ ):

Third step: making an initial decision making matrix ( $\tilde{O}$ ), in fact, is extracted from the simple average of all individual opinions, which in that,  $\tilde{O}_{ij} = (l_{ij}, m_{ij}, u_{ij})$ , are triangular fuzzy dimensions.

$$\tilde{O}_{ij} = \frac{1}{p} \times \sum_{p=1}^p \tilde{a}_{ij}^p \tag{3}$$

$$\tilde{O} = \begin{pmatrix} \tilde{O}_{11} & \tilde{O}_{12} & \dots & \tilde{O}_{1n} \\ \tilde{O}_{21} & \tilde{O}_{21} & \dots & \tilde{O}_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ \tilde{O}_{m1} & \tilde{O}_{m2} & \dots & \tilde{O}_{mn} \end{pmatrix} \tag{4}$$

The fourth step: to calculate the normalized matrix ( $\tilde{Z}$ ) (Matrix 7): Formulas (5) and (6) is used to obtain the normalized matrix (Shieh et al, 2010).

$$\tilde{Z}_h = k \times \tilde{O}_h \quad h = l, m, u \tag{5}$$

$$k = \min \left( \frac{1}{\max \sum_{j=1}^n |\tilde{O}_{ij}|_{1 \leq j \leq n}}, \frac{1}{\max \sum_{i=1}^n |\tilde{O}_{ij}|_{1 \leq j \leq n}} \right) \tag{6}$$

$$\tilde{Z} = \begin{pmatrix} \tilde{Z}_{11} & \tilde{Z}_{12} & \dots & \tilde{Z}_{1n} \\ \tilde{Z}_{21} & \tilde{Z}_{21} & \dots & \tilde{Z}_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ \tilde{Z}_{m1} & \tilde{Z}_{m2} & \dots & \tilde{Z}_{mn} \end{pmatrix} \tag{7}$$

In fifth step, the matrix  $\tilde{V}$  for each level of  $(l_{ij}, m_{ij}, u_{ij})$  is calculated by formulas (8) and (9) and (10).

$$l_{ij}'' = \tilde{Z}_l \times (I - \tilde{Z}_l)^{-1} \tag{8}$$

$$m_{ij}'' = \tilde{Z}_m \times (I - \tilde{Z}_m)^{-1} \tag{9}$$

$$u_{ij}'' = \tilde{Z}_u \times (I - \tilde{Z}_u)^{-1} \tag{10}$$

At the end, each one of lower, mediocre and upper triangular limits are combined together and the matrix  $\tilde{V}$  is calculated.

$$\tilde{V} = \begin{pmatrix} \tilde{V}_{11} & \tilde{V}_{12} & \cdots & \tilde{V}_{1n} \\ \tilde{V}_{21} & \tilde{V}_{21} & \cdots & \tilde{V}_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ \tilde{V}_{m1} & \tilde{V}_{m2} & \cdots & \tilde{V}_{mn} \end{pmatrix} \quad (11)$$

In the sixth step, defuzzification of the fuzzy numbers is carried out. For this purpose, for each  $i$  and  $j$  the formula (12) is used.

$$v = \frac{(1+4m+u)}{6} \quad (12)$$

And so we have:

$$V = \begin{pmatrix} V_{11} & V_{12} & \cdots & V_{1n} \\ V_{21} & V_{21} & \cdots & V_{2n} \\ \vdots & \vdots & \vdots & \vdots \\ V_{m1} & V_{m2} & \cdots & V_{mn} \end{pmatrix} \quad (13)$$

The seventh step in this technique is the calculation of the threshold. The threshold is used to eliminate the less effective criteria in the model. In the DEMATEL method a common threshold is determined for all elements, and then the elements with the value of greater than the threshold are entered in the matrix  $U$ , and instead of the elements with the value of less than the threshold, zero is entered in the matrix  $U$ .

$$T_s = \frac{\sum_{i=1}^n \sum_{j=1}^m v_{ij}}{m \times n} \quad (14)$$

$$TS = \frac{\sum_{i=1}^n \sum_{j=1}^n V_{ij}}{m \times n} = \frac{\sum_{i=1}^n D_i}{m \times n} = \frac{\sum_{j=1}^m R_j}{m \times n} \quad (15)$$

$$\begin{cases} U_{ij} = V_{ij} & V_{ij} \geq T_s \\ U_{ij} = 0 & \text{Otherwise} \end{cases}$$

The eighth step: Calculation of  $D_j - R_i$  and  $D_j + R_i$ , where  $D_j$  and  $R_i$  are obtained respectively by the sum of each row and column of matrix  $x$ . After the calculation of  $D_j - R_i$  and  $D_j + R_i$ , the diagram of the intensities of affecting and influencing is plotted, which is the basis of decision making.  $D_j + R_i$  is located on the  $x$  axis and  $D_j - R_i$  is located on the  $y$  axis. The value of  $D_j + R_i$  indicates the importance of each factor and the more amount of this value the factor gains, the more importance it would have (Wang, Lin, Tang, 2003). To determine the relationship between the factors, we should act according to the following method, with regarding to this technique's assumptions (Quan, HuangWeila & Zhang, 2011).

- 1) If  $(D_j - R_i) < 0$  and  $(D_j + R_i) = \delta$  ( $\delta$  is a large number); so it is said that the factor (i) is the main problem of the considered issue, and it should be resolved.
- 2) If  $(D_j - R_i) > 0$  and  $(D_j + R_i) = \delta$  ( $\delta$  is a large number); so it is said that the factor (i) resolve the core problem of the considered issue, and should be in priority.
- 3) If  $(D_j - R_i) < 0$  and  $(D_j + R_i) = \varepsilon$  ( $\delta$  is a small number); so it is said that the factor (i) is an independent factor that the quantitative factors influence on it.
- 4) If  $(D_j - R_i) > 0$  and  $(D_j + R_i) = \varepsilon$  ( $\delta$  is a small number); so it is said that the factor (i) is an independent factor that affects the small number of other factors. It is noteworthy that all steps have been done by using Excel and MATLAB software (Bojadzief & Bojadzief, 2008).

### 3.2 Research questions

- 1) What are the problems and barriers of using information technology in electronic banking services?
- 2) How is the prioritization of the problems of information technology sector with the development approach of electronic banking services in Iran's banking network?
- 3) What suggestions and solutions can be introduced for removing the barriers and smoothing the process of the optimal use of information technology in electronic banking system?

The study was carried out in 2013. The study population in this research, 30 cases of banking experts, which are identified as active experts and researchers in the fields of banking services in the country's banking system, were selected as a potential candidate of decision making group to collect data for this study. Due to the limited number of identified experts as the statistical population, sampling has not been done, and all identified individuals have been surveyed as experts and decision-makers.

## 4 Finding

To conduct this study, first the matrix  $(17 \times 17)$  ( $\tilde{O}$ ) was calculated, which was obtained by integration of the opinions of individuals with regard to the seventeen key factors of variables affecting the development of electronic banking, with using the simple average method. Then the obtained matrix is normalized. To normalize the group decision matrix we act as follows, we separated the limits of fuzzy numbers (l, m, u), and obtain the row sum of all

matrixes. Then all elements of each matrix (i.e. the matrix of the l) are divided into the largest value of the corresponding matrix (i.e. the matrix of the l). Therefore, each fuzzy limits matrix will be normalized. The normalized matrix ( $\tilde{Z}$ ) is obtained by combining three normalized matrix.

After normalizing persons' opinion about the relationship between the effective criteria and the development of electronic banking, matrix ( $\tilde{V}$ ) must be calculated. Matrix ( $\tilde{V}$ ) is calculated for each ( $\tilde{V}_{ij}$ ) related to the matrixes ( $l_{ij}''$ ,  $m_{ij}''$ ,  $u_{ij}''$ ), and the formulas (8), (9) and (10) are used to obtain the matrix ( $\tilde{V}$ ) corresponding to fuzzy limits. Finally, by combining 3 matrixes, the matrix ( $\tilde{V}$ ) is obtained.

Table 4  
*Calculations of R and D*

متغيرها	D	متغيرها	R	متغيرها	D+R	متغيرها	D-R
C1	0.943696	C1	1.218232	C1	2.161928	C1	-0.27454
C2	0.959024	C2	1.050799	C2	2.009823	C2	-0.09178
C3	1.701769	C3	1.069537	C3	2.771306	C3	0.632231
C4	1.475341	C4	1.346312	C4	2.821653	C4	0.129028
C5	1.217882	C5	1.31577	C5	2.533652	C5	-0.09789
C6	1.095968	C6	1.272172	C6	2.36814	C6	-0.1762
C7	1.444456	C7	1.083673	C7	2.528129	C7	0.360783
C8	1.089914	C8	1.319508	C8	2.409421	C8	-0.22959
C9	1.386581	C9	0.530671	C9	1.917252	C9	0.85591
C10	1.200336	C10	0.422317	C10	1.622652	C10	0.778019
C11	1.420792	C11	1.037703	C11	2.458495	C11	0.383089
C12	0.548389	C12	0.730446	C12	1.278835	C12	-0.18206
C13	1.057807	C13	0.833431	C13	1.891237	C13	0.224376
C14	1.223116	C14	1.215254	C14	2.438371	C14	0.007862
C15	0.69837	C15	1.225173	C15	1.923543	C15	-0.5268
C16	0.406013	C16	1.27678	C16	1.682792	C16	-0.87077
C17	0.700526	C17	1.6222	C17	2.322727	C17	-0.92167

Source: research findings.

After this step, it is the calculation of (D and R), where D is the sum of the row and R is the sum of column, which were excluded from fuzzy condition, with considering the method of center of gravity, and then the (D+R) and (D-R) were calculated.

The last step is charting the diagram of direct and indirect effects due to the (D+R) and (D-R) and also by using table 4, which is actually obtained by defuzzification of the calculated matrix ( $\tilde{V}$ ). The degree of affecting and

influencing of each of the variables affecting the development of electronic banking were identified.

## 5 Conclusion and Suggestions

In response to this question: how is the prioritizing of information technology problems of information technology sector with the development approach of electronic banking services? It can be said that the most effective factor is the society culture of acceptance of IT. In other words, the society culture of acceptance of IT, were recognized as the most affecting factor, among other factors and being correct and up to date for information of information resources were recognized as the most affected factor. Dare to say that being correct and up to date the information of information resources is the result of the society culture of acceptance. As it is observed, in this process, a weak culture of society in acceptance and application of information technology leads to the lack of public awareness of IT services among bank customers. Then by considering next factors, field of telecommunication and telecommunications infrastructure is an important factor in underdevelopment of information technology.

Having a strong organization culture is parallel with the theory of korpela. A lack of familiarity of managers with the information technology is one of the factors in management domain, which their lack of familiarity as either openly or concealed can have various reasons, which pathology in its category requires a separate research. The next factor is the absence of strong regulations that deal with cyber criminals. Perhaps this factor, related to the society culture of acceptance of information technology.

The next factor is the recruitment of human resources and skilled programmers in the field of information technology, which certainly existence of related human resources in each organization creates culture of acceptance by using tools associated with their in such way of modern non-traditional, which in continuation, will result the coordination in policies of the organization in the field of information technology. This is the next and the last factor affecting on development of information technology in the area of electronic banking.

Following the effects of these factors, which have been introduced as affecting factors in the model, categories such as various decision making centers in the fields of IT, development and adequate number of networks, continuous training of individuals in IT, managers' planning for promoting and maintaining IT, existence of modern hardware and software, system care and safety, necessary standards in information sources, lack of information

resources, and finally being correct and up to date the information of information resources, are affected from other factors, which, both in theory and in practice, their obvious examples are considerable.

In response to another question: what suggestions and solutions can be introduced to remove the problems and smooth the process for the optimal use of information technology in electronic banking system? It can be said:

- According to the indexes, those are the parts of affecting factors on problems of information technology, and the most important one is the society culture of acceptance, using of electronic banking service should be part of society norms. These norms should be executive through public informing including education through the mass media and mass education in schools or universities, or any of the other ways. These educations will cause a general knowledge of IT services.
- The implementing the policies of Article 44 of Iran's Constitution leads to the privatization of governmental banks. But it seems these bank managers, in facing with information technology, still don't have the required and up-to-date acquaintances with modern information technologies. This partly pervades of the adoption of organization culture. The result of this is that the communications context for using new services of the organization will not be prepared. In the organizational dimension this also gives rise to inconsistencies in the organization policy makings on the use of information technology.
- In human resources dimension, first-rate university and experienced personnel should be supported by banks and development of the quality of human resources and improve working life of staff by increasing levels of authority and appropriate communication between management and employees.
- It is recommended to the information technology departments of banks to be active members in specialized forums in the field of information technology, as much as possible, and by cooperation with information technology experts of Central Bank (as an entity overseeing on the banks) to prepare comprehensive and strong legislation against cyber abuses in the area of electronic banking.

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