IDENTIFICATION AND PRIORITIZATION OF IT INHIBITING FACTORS IN THE DEVELOPMENT OF ELECTRONIC BANKING SERVICES IN STATE BANKS OF TEHRAN

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Abstract

The investigation of e-banking in state banks shows that e-banking small segment of banking activities. A study of ATM performance and transactions has been done via internet shows the weakness of e-banking in public banks. The question is what are the challenges and barriers of execution development of e-banking and services or whether the cause of these barriers exists outside the banks boundaries. In other words, is the problem because of the lack of IT, cultural, and legal substructure? Or is it because of internal factors of the banks like management resistance, etc.? Eventually, what strategies have to be taken in order to develop the e-banking services by banks? To respond the above questions, we studied the literature review, and then through interview the dimensions, factors, substructures, human resource, financial resource, management, rules, corporate policies, data resources were found out. The questionnaire was developed and distributed among 285 branch managers (and assistant managers, and senior operators). To analyze the data, we applied descriptive and inferential statistics methods e.g. Friedman test. Results show that financial IT barriers are in the first level and corporate policies, management, rules and culture come next.

Key words: Electronic Banking – IT barriers – Services – IT – bank

Introduction

Among the characteristics of the 21st century, it can be pointed to amazing development of technology, information, and communication, and use of IT and information networks to improve the speed and quality of service provision. These developments have also strongly affected the banking and caused major changes in the industry. The increasing growth of e-commerce transactions worldwide and the business need to banks for the transfer of financial resources has caused electronic banking as an integral part of e-commerce to play an essential role in its implementation; hence, there is no question that without e-banking, e-commerce will not be also achieved. Rapid development of information technology has caused major changes in the form of money in transmission systems of resources in the field of technology and provided new concepts, such as electronic money, in its electronic transmission (e-banking conference in Iran, 2005). Information technology has provided many advantages (such as speeding up operations, consistency in creating data, access to information, and data exchange) for various industries (Stewart, 2003).
Information technology is increasingly used for strategic reasons and can improve the efficiency of organizations and the control and productivity of internal processes (Stewart, 2007).

**Problem Statement**

The rapid growth of information technology and the expansion of its influence in all areas of human affairs have caused humanities scholars to be placed in ambiguous situations. The impact of this technology on business, economics, and banking has immeasurably promoted and flourished companies’ interactions and international financial transactions. Information technology as a tool for creating value has undertaken an important role in business activities. Today, the technology and its developments has become one of the most important elements in the strategic environment of organizations. As the target of technology management is to manage the application and institutionalization of technology as a strategic resource in the organization and create strategic value using it, technological management as a wider context of technology management is aimed at understanding and controlling the use of technology in all management duties (Chanaron et al., 2002). Undoubtedly, the central role of banking systems in the function of economic systems is inevitable. In recent decades, the role of banks has rapidly changed in the industrialized countries and new tools along with this modern technology have been available to banking services. Providing different services in the electronic markets and easy access to the required information are considered as the major predisposing factors for e-banking. Implementation of electronic banking requires various infrastructures whose effects and challenges should be studied while developing e-banking, because understanding these infrastructures and their impacts can be an appropriate guide for banks in achieving the success (Roeg, Fergguson, 2002).

Along with development of international economics, banks are also experiencing rapid changes; actually, the cause of this development is technology which has shattered geographic boundaries and created new products, services, and market opportunities and developed business processes based on the information (Liao, Zipi, 2001).

In the meantime, considering the radical changes occurred in the economic structures and financial systems, the role of banks as institutions affecting the economy has become more important and highlighted than ever; therefore, it is requires that in line with these changes, banks become the source of new developments as well. Information technology has great potential in solving problems in organizations; for example, increasing the speed and accuracy, reducing the physical size of data repositories, eliminating some administrative corruptions, transparency in the work, providing full-time jobs using IT, allowing remote collaboration, and reducing costs of a system or organization; also, IT is used to coordinate between different individuals and groups and reduce uncertainty (Jahangiri, 2007). Along with the economy and the mentioned sectors, banks, as one of the economic pillars of society, are also trying to use modern technologies to achieve the expansion of services, speeding up the delivery of services, the reduction of costs, increasing efficiency and productivity, and providing modern banking services. Accordingly, the Monetary Research Center of the Central Bank of Iran seeks to achieve the above mentioned goals by giving priority to the issue (identification and prioritization of IT inhibiting factors in the development of e-banking services in the state banks of Tehran) as a research plan. Hence, the present study aims to investigate the barriers and inhibitor factors of information technology in the development of e-banking services in the state banks of Tehran and determine their priorities.
The importance and necessity of the research

Wonderful development of information technology and its expansion to global monetary and banking markets has revolutionized the current methods of banking in addition to facilitating the affairs of customers. Today, customers’ judgments about banking affairs are based on the banks’ ability to help solve problems and develop the business. Security and speed of transactions, friendship with consumer, confidence, and ease of use are the most important factors influencing customers’ choice of banks (Akinci Serkan, 2004). Today, the speed of work performance, sharing information, and directing commercial exchanges through communication networks have become as an indubitable principle of success in the market. The main features of all these activities are to simplify processes, reduce costs through increasing coordination, improve access to customers, and increase the variety of services offered to customers (Milind, S., 1999). Also, to achieve the development of e-commerce in the country, entry into international markets, and membership in organizations such as the World Trade Organization, the basic requirement is to have an efficient banking system; on the other hand, according to the statistics of the Central Bank of Iran, more than 7 billion and 110 million pieces of paper money are used in Iran, which in this respect, Iran holds first place in the world (Ebrahimi, 2002). In addition to enhancing the quality of services, deployment of electronic banking reduces bank costs by 60-70% (Akinci Serkan, 2004). Besides the positive effects in economic terms, electronic banking has positive and significant effects in other social dimensions; hence, considering the issue that e-banking in the state banks of Tehran is more backward than other leading countries, so it is necessary to identify the barriers and inhibitor factors of information technology in the development of e-banking and its services and provide solutions to overcome them.

The research hypotheses

- The main hypothesis:
  Identification and prioritization of IT inhibiting factors directly affects the development of e-banking services in the studied banks.

The research sub-hypotheses:

1. Infrastructures as a deterrent have a direct impact on the development of e-banking services.
2. Financial resources as a deterrent have a direct impact on the development of e-banking services.
3. Human resources as a deterrent have a direct impact on the development of e-banking services.
4. Information resources as a deterrent have a direct impact on the development of e-banking services.
5. Comprehensive organizational policies as a deterrent have a direct impact on the development of e-banking services.
6. Culture as a deterrent has a direct impact on the development of e-banking services.
7. Rules and regulations as a deterrent have a direct impact on the development of e-banking services.
8. Management as a deterrent has a direct impact on the development of e-banking services.

The research background

1. Amadeh and Jafarpoor (2009) conducted a study as “investigating barriers and solutions to the development of e-banking in private banks of Iran” in Allameh Tabatabai University (Tehran-Iran). The population of this research consisted of 410 experts in banking affairs and e-banking and senior managers of private banks. The results of this study showed that the main barriers include cultural-social, legal, managerial, financial, technical, and technological ones. Considering 29 indices studied in this research, the mentioned barriers were tested at the confidence level of 95%.
2- Another study as “evaluating the quality of banking services and determining its priorities and promotion solutions” conducted by Ardekani et al. (2009) showed that 1- there is a significant difference between views of customers and employees on the importance of factors affecting the quality of banking services, 2- there is a significant difference between customers’ expectations and perceptions of service quality provided by banks so that their expectations are higher than their perceptions, 3- there is no significant difference between customers’ expectations of banking services and service providers’ perceptions of customers’ expectations, and 4- there is a significant difference between service providers’ perceptions of customers’ expectations and existing services quality parameters so that service providers’ perceptions of customers’ expectations are significantly higher than the existing services quality. This research population consisted of the Agricultural Bank staff and their clients from which 230 clients and 140 employees were selected as statistical samples.

3- Salimi M. (2008) studied “barriers to the expansion of e-banking in private banks of Iran” in Tehran University (Faculty of Management). The research population consisted of all IT professionals and presidents of private banks (in Iran) including Parsian, EN, Pasargad, Sarmayeh, Karafarin, and Saman banks. The results of this study showed that the barriers include 1- Improper use of information technology, 2- the lack of legal measures, 3- worthlessness of time in popular culture and 4- the disconnection of websites while exchanging money.

4- Glenda H.E. Gay (2012) studied “the technological barriers to the readiness of electronic instructors in an Internet environment” in Nova Southeastern University. According to the results of this study, the electronic readiness has a strong effect on the system quality in the design stage; user satisfaction in the stage of system delivery has the strongest effect on the net benefits of the system’s output; the data quality has the strongest impact on user satisfaction in the stage of system delivery. Briefly, results showed that all six dimensions studied in this research are different from each other; and among these six indices, job satisfaction has the highest contribution and effectiveness.

5- Katono (2011) in a research as “students’ evaluation of electronic services quality scale in Uganda: ATM as the case study” investigated the electronic services quality to identify the dimensions of electronic services quality evaluation in the emerging market context, especially ATM machines. The findings of this study showed that factors including tangibility, issues related to credit cards, and credibility and location of ATM are the most important dimensions used by Ugandan students to evaluate the quality of electronic services provided by ATM.

6- A study as “quality of banking services: empirical evidences from retail banking customers in Greece and Bulgaria” conducted by Petridou et al. (2007) showed that due to Greek consumers’ perceptions of the banking services quality, these customers receive banking services with higher quality in comparison to Bulgarian customers. The population of this research consisted of customers of banks in Greece and Bulgaria from which 153 Greek and 70 Bulgarian were selected as the statistical sample.

7- Joseph et al. (1999) performed a study as “service quality in banking: the impact of technology on services delivery” in Australia. They tried to investigate the role of technology in banking and its impact on the services provided. The research population consisted of all customers of banks in Australia from which 440 people were selected to answer questionnaires. The data collected through the questionnaires were assessed using the importance – performance grid developed by Hemmasi et al. (1992). The results of this study showed that accuracy, efficiency, feedback, data management, access, and customization are the factors affecting the perception of excellent quality of e-banking services.
The conceptual model of the research
After reviewing the literature and studies conducted inside and outside Iran, a number of dimensions and indices were recognized as barriers to IT in the development of e-banking services and based on these factors, the conceptual model is designed as follows:

Figure 1: the conceptual model of the research

The research methodology
The type and method of the research:
Based on the purpose, the present study is an applied research, because it focuses on the development of applied knowledge in the field of IT inhibiting factors and the development of quality and quantity of electronic banking services in state banks. On the other hand, this research is a descriptive-survey study in terms of the data collection method.

The research statistical population:
Since the present study aims to identify and prioritize IT inhibiting factors in the development of electronic banking services in state banks of Tehran-Iran, the research population consists of 1100 branches of Tehran’s state banks including Bank Melli Iran (with 544 branches in Tehran), Bank Sepah (with 225 branches in Tehran), Export Development Bank of Iran (with 5 branches in Tehran), Bank of Industry and Mine (with 10 branches in Tehran), Agriculture Bank of Iran (with 162 branches in Tehran), Post Bank of Iran (with 36 branches in Tehran), and Cooperative Development Bank (with 15 branches in Tehran).

The sampling method and determination of the sample size:
In this study, the probabilistic method (of the type of stratified random sampling) was used commensurate with the size of each class; it is noteworthy that in addition to being proportional to the size of each class, the samples have been distributed among classes based on the distribution of each bank’s branches in five sections including north, south, east, west and center of Tehran; namely, two methods have been used: 1- random sampling method proportional to the size of each class, 2- distributing samples based on the distribution of each bank’s branches in five sections including
north, south, east, west and center of Tehran. The following formula has been used to calculate the size of statistical sample:

\[ n = \frac{z^2 \cdot \delta^2}{d^2} \]

The variance of responses obtained from the initial sampling was reported equal to 0.361; and using the above formula, the sample size was obtained to be 285 at the confidence level of 95% \((\alpha)\) and estimation accuracy of 7% \((d)\).

**Data collection tools:**
Since the present study is an applied-descriptive research, documentation procedures and library studies such as reviewing research and dissertations on the subject, studying related articles and books, using the Internet to access new and relevant contents, and so forth have been used to collect data. On the other hand, the research is a survey study, so interviews and questionnaires were used to gather information in this regard.

**The data analysis:**
Descriptive data have been analyzed using the SPSS19, Word, and Excel software. Approximately 92% (261 people) and 8% of the respondents were respectively male and female; the number of men is over 11 times the number of women in the sample of Tehran’s State Banks. Regarding the frequency of education, the highest level is related to the bachelor’s degree (56%); then, the diploma (24%), associate degree (9%), and master’s degree (2%) are respectively in the next rankings in terms of the lowest percentage in the sample size. About the work experience, the number of people with less than 5, 5-10, 10-15, 15-20, and higher than 20 years of experience are respectively 5 (1.8%), 22 (7.7%), 73 (25.6%), 104 (36.5%), and 72 people (25.3%). As observed, the work experience of 15-20 years has the highest number of people among the samples. Regarding the marital status, the highest frequency is related to married ones (85%) while the frequency of single respondents is equal to 8%; however 7% of respondents have not answered the question. About the respondents’ organizational position, the highest frequency is related to the management position (44%); and then, deputy (30 %), senior member (17 %), and not answered (9%) are respectively in the next rankings in terms of the lowest percentage in the sample size. Regarding the frequency of banks branches, the highest frequency is related to Bank Melli Iran (43.5%); and then, Bank Sepah (19.6%), the Housing Bank (13.7%), Agriculture Bank of Iran (9.1%), not answered (8.1%), Post Bank of Iran (3.2%), Cooperative Development Bank (1.4%), Bank of Industry and Mine (1%), and Export Development Bank of Iran (0.4%) are respectively in the next rankings in terms of the lowest percentage in the sample size. About the respondents’ field of study, the highest frequency is related to accounting (21.1%); and then, management (19.2%), economy (17.2%), experimental field (9.5%), not answered (7.4%), humanities (5.6%), mathematics and banking sciences (5.3%), statistics (3.9%), and public relations (1.4%) are respectively in the next rankings in terms of the lowest percentage in the sample size.

**The results of data analysis**
According to the results obtained from the Friedman test, among the IT inhibiting factors and based on their mean, the highest mean (7) is related to the financial resources; and then, the comprehensive organizational policies (5.67), rules and regulations (5.50), human resources (5), management and information resources (3.42), culture, and infrastructures are respectively in the next rankings. Among the indices of inhibiting factors related to IT infrastructures, the highest rank (3.67) is
reported for lack of proper telecommunication platform; and then, bandwidth (3.37), the number of network services (2.80), using outdated software programs (2.46), and unavailability of modern hardware are respectively in the next rankings. Among the indices of human inhibiting factors of IT, the highest rank (4.61) is reported for non-continuous training of employees; and then, lack of staff skills (4.31), shortage of programmers (3.26), experts’ out of date information (3.20), manpower recruitment problems (3.12), and employees’ resistance (3.05) are respectively in the next rankings. Among the indices of financial inhibiting factors of IT, the highest rank (3.23) is reported for lack of adequate financial resources for the development of broadband and telecommunication infrastructure; and then, inadequate funding for the development of IT systems (3.10), limitation of financial resources to purchase updated software programs (3.03), inadequate funding for maintenance of IT systems (2.91), limitation of financial resources to purchase modern hardware (2.73) are respectively in the next rankings. Among the indices of managerial inhibiting factors of IT, the highest rank (3.49) is reported for managers’ weak leadership; and then, managers’ insufficient education (3.20), managers’ unfamiliarity with IT systems (2.96), managers’ careless planning (2.80), managers’ resistance to the use of IT (2.56) are respectively in the next rankings. Among the indices of cultural inhibiting factors of IT, the highest rank (3.26) is reported for the society culture in adoption of electronic banking; and then, lack of public trust in 24-hour services (3.24), public unawareness about the services (3.01), lack of public culture-building (2.85), and weak organizational culture in using information technology (2.65) are respectively in the next rankings. According to the results obtained from the Friedman test, among the indices of legal inhibiting factors of IT, the highest rank (3.99) is reported for lack of regulations to deal with cyber criminals; and then, the multiplicity of decision-maker authorities (3.91), the absence of a comprehensive law (3.87), lack of complete rules for dealing with problems (3.39), defects in supervision (3.05), and lack of regulations to support the implementation of IT are respectively in the next rankings. Among the indices of comprehensive organizational policies which act as inhibiting factors of IT, the highest rank (4.44) is reported for weaknesses in the implementation of policies; and then, inconsistency in making comprehensive policies (3.97), parallel working in the organization (3.41), the absence of a comprehensive law for dealing with problems (3.14), lack of regulatory bodies (3.07), and the centralization of decision-making are respectively in the next rankings. According to the results obtained from the Friedman test, among the indices of information resources which act as inhibiting factors of IT, the highest rank (3.81) is reported for the out-of-date information; and then, inaccurate information (3.39), lack of reliable information resources (3.09), low-quality information resources (2.50), lack of standards for information resources (2.02), and the centralization of decision-making are respectively in the next rankings.

**The research results**
- Considering the research literature and similar articles and theses conducted in this field and interviewing with the head of RTGS System in the Central Bank of Iran, the dimensions and indices which act as inhibiting factors of IT in the development of e-banking services are identified as human resources, infrastructures, financial resources, rules and regulations, comprehensive organizational policies, culture, and information resources.
- Table 1 shows the ranking of dimensions identified as IT inhibiting factors based on the results obtained from the Friedman test:

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infrastructures</td>
<td>2.92</td>
</tr>
<tr>
<td>Human Resources</td>
<td>5</td>
</tr>
</tbody>
</table>

365
Some suggestions and solutions for eliminating barriers and optimal use of information technology in improving the services of state banks

1- The first problem of state banks is related to financial resources; hence, it is recommended to consider a special budget for IT or conduct IT projects in partnership or entrust the projects to contractors through bidding.

2- Regarding the second barrier of state banks which is related to comprehensive organizational policies, it is recommended to reassess the bank’s activities and internal rules to design comprehensive laws which are consistent with the existing situation.

3- The third problem is related to rules and regulations. In this respect, it is suggested that banks, the central bank, and the government work together to develop comprehensive e-banking laws or use the laws of other countries which have longer experience in this regard.

4- The fourth inhibiting factor is related to human resources. In this regard, it is recommended to hold seminars and training courses for individuals and encourage people to learn how to work with modern tools and new services as well as hire specialized staff and retire people who have low literacy levels.

5- The fifth case is related to information resources. In this respect, it is recommended to use tools with international and accepted standards as well as provide updated information for individuals.

6- The sixth barrier is related to management. In this regard, it is suggested to provide training courses for managers as well as give them consultation on the benefits of e-banking.

7- The seventh inhibiting factor is related to the culture. In this respect, it is recommended to build the culture of using e-banking services through television advertising or billboards installed on the highway, education in schools, determine prizes for those who are doing the major of their deeds by e-services, build public confidence, and determine heavy penalties for criminals.

8- The eighth barrier is related to infrastructures; in this regard, it is suggested to allocate satellite networks for e-services, provide modern and updated software and hardware, employ specialists in networking, and extend the bandwidth.

According to the responses received from senior executives and members of studied banks, the most important factor inhibiting IT was identified for each bank. Table 2 shows these factors based on which distinct suggestions have been provided for each bank.

<table>
<thead>
<tr>
<th>The name of the bank</th>
<th>The most important inhibiting factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bank Melli Iran</td>
<td>Rules and Regulations</td>
</tr>
<tr>
<td>Bank Sepah</td>
<td>Comprehensive Organizational Policies</td>
</tr>
<tr>
<td>Export Development Bank of Iran</td>
<td>Insufficient Budget Allocation</td>
</tr>
<tr>
<td>Bank of Industry and Mine</td>
<td>Insufficient Budget Allocation</td>
</tr>
<tr>
<td>Agriculture Bank of Iran</td>
<td>Limiting Rules and Regulations</td>
</tr>
<tr>
<td>Housing Bank</td>
<td>Cumbersome Rules and Regulations</td>
</tr>
<tr>
<td>Post Bank of Iran</td>
<td>Shortage of Financial Resources</td>
</tr>
<tr>
<td>Cooperative Development Bank</td>
<td>Infrastructures and Financial Factors</td>
</tr>
</tbody>
</table>
Suggestions for each bank
- Regarding Bank Melli Iran, Agriculture Bank of Iran, and Housing Bank, since the most important inhibiting factor is inflexible and traditional official laws, it is recommended to review the rules and replace them with more flexible ones.
- Regarding Bank Sepah, since instability in the implementation of organizational policies and inconsistencies in policies have reduced the quality of e-services, it is recommended to reassess and redesign the bank’s activities and internal rules.
- Regarding Export Development Bank of Iran, Bank of Industry and Mine, Post Bank of Iran, and Cooperative Development Bank whose most important inhibiting factor is insufficient budget allocation, it is recommended to consider special funds for the development of information technology and spend the budget for upgrading IT facilities through proper and rational planning. However, regarding the Cooperative Development Bank, there is another barrier in addition to financial resources, which is infrastructures; hence, it is recommended to provide modern hardware and software as well as employ expert people to eliminate this inhibiting factor.

Suggestions based on the research results
Considering the results obtained from studying IT inhibiting factors in the development of e-banking services in state banks of Tehran, some suggestions are presented for each barrier as follows:
1- The first barrier is related to financial resources; to eliminate the barrier, it is recommended to consider a special budget for IT or conduct IT projects in partnership or entrust the projects to contractors through bidding.
2- Regarding the second barrier of state banks which is related to comprehensive organizational policies, it is recommended to reassess the bank’s activities and internal rules to design comprehensive laws which are consistent with the existing situation.
3- The third problem is elated to rules and regulations. In this respect, it is suggested that banks, the central bank, and the government work together to develop comprehensive e-banking laws or use the laws of other countries which have longer experience in this regard.
4- The fourth inhibiting factor is related to human resources. In this regard, it is recommended to hold seminars and training courses for individuals and encourage people to learn how to work with modern tools and new services as well as hire specialized staff and retire people who have low literacy levels.
5- The fifth case is related to information resources. In this respect, it is recommended to use tools with international and accepted standards as well as provide updated information for individuals.
6- The sixth barrier is related to management. In this regard, it is suggested to provide training courses for managers as well as give them consultation on the benefits of e-banking.
7- The seventh inhibiting factor is related to the culture. In this respect, it is recommended to build the culture of using e-banking services through television advertising or billboards installed on the highway, education in schools, determine prizes for those who are doing the major of their deeds by e-services, build public confidence, and determine heavy penalties for criminals.
8- The eighth barrier is related to infrastructures; in this regard, it is suggested to allocate satellite networks for e-services, provide modern and updated software and hardware, employ specialists in networking, and extend the bandwidth.
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