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Recognition of Factors Affecting the Successful Implementation of Electronic-Banking in Iran

[1]M.A. Sarlak, [2]A.R. Aliahmadi, [3]A. Ghorbani and [3]M. Shahidi
[1]Faculty of Public Management, Payame Noor University, Tehran, Iran
[2]Faculty of Industrial Engineering, University of Science and Technology, Tehran, Iran
[3]Department of Business Administrative, Payame Noor University, Tehran, Iran

Abstract: This research examines the factors that can speed up the successful implementation of electronic banking innovations in the Iran's country. Through the literature review, the factors affecting the successful implementation of e-banking in Iran have been detected and classified into a tri-radiate model of co-structural, content and context factors. After collecting the questionnaires which were distributed randomly among experts and IT managers of 90 banks, the data analysis revealed that there is a meaningful and significant relationship between these three factors and the successful implementation of e-banking in Iran. Using Friedman analysis of variance test, the co-structural factors got first rank, context factors as second and the content factors the third rank, respectively. Mean while, the influencing factors on implementing e-banking were classified and ranked. Finally, some recommendations have been proposed to develop and reinforce the affecting factors bound up with implementing e-banking.

Key words: E-banking, co-structural factors, content factors, contextual factors, tri-radiate model

INTRODUCTION

It is widely believed that the impact of e-commerce enables banks to provide an inexpensive and direct way of exchanging information and to sell or buy products and services. Burr defines e-banking as an electronic connection between the bank and the customer in order to delivering, managing and controlling the financial interactions (Luštšik, 2004). The advances in information technology are becoming an important factor to the future development of banking industry (Kannabiran and Narayan, 2005). E-banking advantages can be viewed Through two approaches: a) By customer's vision: the high speed of offering services, easy to use, availability and accuracy, removing time and place limitations; b) By bank vision: competitive advantage, customer retention and attraction, etc. (Liao and Choeung, 2002).

E-banking initiated in the years 1993-1994 in Iran. The initial efforts to information exchange network between banks (shetab) generated by three public banks in the year 2000. Then, the central bank initiated shetab system with the aim of creating connection among banks (Bahramian, 2003). Commercial banks in Iran have been quick to realize the importance of e-banking to competitive advantage. Since the 2001, they have continuously innovated through technology-enhanced products and services, such as multi-function Automatic Teller Machines (ATMs), electronic share application, tele-banking, TV-banking, electronic transfers, electronic cash cards and Internet-based e-banking. It can be claimed that Iran have stepped into the e-banking world.

According to ICTna, only 7.5% of Iran banking network customers had possibility to internet buying at the end of 2008 but the emergence of new private-sector banks in the country e.g., Pasargad, Saman, Eghtesad Novin and Parsian has changed the scenario drastically, as the business model of these new banks revolved around a strong IT backbone. Almost all of these banks costumers have Credit Card, can buy form internet. Emergence and success over the last several years have put competitive pressure on many of the state-owned banks to look at IT as a strategic necessity to remain competitive (Kannabiran and Narayan, 2005). Therefore, understanding the success factors in e-banking is important for senior management of banking related organizations because it would help them improve their e-banking implementation process. In an attempt to find out how some banks were successful in Iran, this study is to recognize the effective factors in successful

Corresponding Author: Ali Ghorbani, Janbazan Alley, Bahonar St, Bonab, East Azerbaijan Province, Postal Code 55519-78146, Iran Tel: +98 914 920 88 24 Fax: +98 21 22 80 84 94

implementation of e-banking in Iran's banking system, what important indexes came out of their experience which could be used by others going to implement e-banking.

This study has tested three hypotheses in the form of tri-radiate model for recognizing and ranking effective factors in successful implementation of e-banking:

- There is a meaningful relation between co-structural factors and successful implementation of e-banking in Iran's banking system
- There is a meaningful relation between content factors and successful implementation of e-banking in Iran's banking system
- There is a meaningful relation between contextual factors and successful implementation of e-banking in Iran's banking system

Since 1960, and specially after proposing general systems theory, it seems less likely that a theorist would not use clarification of theory relation with these three fundamental concepts in management, i.e., human, organization and society or environment (Mirzaei and Amiri, 2002).

Tri-radiate model is one of logical models in classifying models. According to this model, all organizational concepts, events and phenomena can be studied, analyzed in the frame of tri-radiate (co-structure, content and context) theoretical model (Mirzaei, 1998).

Co-Structure (Organizational) dimension of organization means all of elements, physical and non-human factors and conditions of the organization which are bounded together through special order and regulation and constitute frame, cover, or physical and material body of the organization. In fact, co-structural dimension contain non-alive factors of the organization (Sarlak and Mirzaei, 2005; Mirzaei, 1998). According to Damanpour (1987) these factors are variables such as theories are: functional differentiation (the number of different functional units in an organization), specialization (different areas of expertise in an organization), professionalism (professional knowledge including employees' education and experience), formalization (the degree to which rules and procedures are followed in an organization) and centralization (whether decision making is centralized or distributed).

Individuals do not passively accept and use technology. In contrast, they actively enact technologies in different ways. They can use it minimally, maximally, or improvise in ways that are hard to anticipate (Gwebu and Wang, 2007). Content or human dimension of organization means human and its behavior in the organization which are bounded together through special patterns, behavioral norms and unofficial communications and constitutes the main content of the organization and are regarded as, in fact, alive factors of the organization (Mirzaei, 1998).

Context dimension includes all environmental and extra-organizational factors and conditions surrounding the organization and constitute main systems of the organization such as customers, government, markets and other environmental elements of the organization (Mirzaei, 1998). Researchers in information technologies and organizational studies have long pointed out that an identical technology can be enacted differently in different organizational context (Boudreau and Robey, 2005; Vinnem and Liyanage, 2008). They adopt This dimension not only is the most important and main dimension but also creates the other two ones and general growth and survival of the organization depends upon it (Mirzaei, 1998). Damanpour (1987) focused, on the dynamism of the environment and further classify environmental dynamism into two components: environmental stability and environmental predictability. These two components have resulted in four combinations of environment characteristics: stable and predictable, stable and unpredictable, unstable and predictable, unstable and unpredictable (Gwebu and Wang, 2007). Reserchers adopt a less deterministic view and propose that both human agency and the social context within which a technology operates play an important role in the outcome of the technology (Vinnem and Liyanage, 2008; Gwebu and Wang, 2007).

Considering research literature and also special problems of Iran's bank regarding successful implementation of E-banking; this research has been tried to give comprehensive summary of indexes or sub-variables of literature which were pointed out in more than 30 foreign and domestic researches, summarized and classified in the form of tri-radiate model (conceptual framework of research). Therefore, it can be said that independent variables of the research include co-structural, content and context factors. We can refer to successful implementation of E-banking as a dependent variable. According to Table 1, factors affecting successful implementation of E-banking are divided into three co-structural, content and context dimensions and each of these dimensions are included different factors based on their definitions.

Table 1: Tri-radiate model; factors affecting successful implementation of e-banking in Iran's banking system

Effectives	Indexes	Researchers
Co-structural	Security of IT systems in e-banking	Daniel and Story (1997), Wallman (1999), Regan and Macaluso (2000), Turban *et al.* (2008), Enos (2001), Mahmood *et al.* (2006), Sarlak *et al.* (2009)
	Telecommunication, software, hardware and technical infra-structures	Dejpasand (2006), Ferguson (2000), Sachs (2000), Mahmood *et al.* (2006)
	Financial sources for investing in e-banking	Mahmood *et al.* (2006), Sarlak *et al.* (2009), Rao *et al.* (2003), Kuzic *et al.* (2002)
	Drawing of the Internet market map for the e-banking strategy	Dejpasand (2006), Stamoulis (2000), Eid *et al.* (2002)
	Presenting a comprehensive website, contain: Corporate profile, product and pricing information, interest rates and application forms etc	Stamoulis (2000), Riggins (1999), Rao *et al.* (2003), Darch and Lucas (2002)
	Using branding for highlighting e-banking systems	Cooper *et al.* (2009), Yousafzai *et al.* (2005)
	Transforming internal foundations to be effective and integrated in order to provide each customer with unique offerings	El Sawy *et al.* (1999), Enos (2001), Franco and Klein (1999), King and Liou (2004), Mahmood *et al.* (2006), Mahmood *et al.* (2008)
Content	Educated and efficient staff in e-banking context	Sotudeh (2003), Sachs (2000), Al-Hajri (2008), Mahmood *et al.* (2006), Sarlak *et al.* (2009)
	A user-friendly web-interface and appropriate promotion	Turban *et al.* (2008), Riggins (1999), Mahmood *et al.* (2006), Kuzic *et al.* (2002), Eid *et al.* (2002)
	Positive view of point into e-banking and existence of innovation motivation among staff and management of bank	Kehzadi (2002), Dejpasand (2006), Riggins (1999), Al-Hajri (2008), Mahmood *et al.* (2006)
	Enough knowledge and cognition of staff on opportunities and benefits of e-banking	Mahmood *et al.* (2008), Sarlak *et al.* (2009)
	Efficient and very quick customer service	Jayawardhena and Foley (2000), Orr (2004), Kuzic *et al.* (2002), Eid *et al.* (2002)
	Planning toward training (e.g. ICDL courses) and updating knowledge and skills of staff	Sotudeh (2003), Darch and Lucas (2002), Eid *et al.* (2002)
	The data gathered about the customer with any interaction, for good understanding needs and wants of customers	Sotudeh (2003), Franco and Klein (1999), Regan and Macaluso (2000), Storey *et al.* (2000), Mahmood *et al.* (2006)
	Support of head management from implementation of e-banking	Dejpasand (2006), Turban *et al.* (2008), Sarlak *et al.* (2009), Kuzic *et al.* (2002), Eid *et al.* (2002)
Context	Regulations convenience related to e-banking	Kehzadi (2002), Kannabiran and Narayan (2005), Sarlak *et al.* (2009), Kuzic *et al.* (2002)
	Convenience and customer accessibility to web based services (e.g. computer, high speed internet etc)	Crede (1999), Sarrafizadeh (2005), Cooper *et al.* (2009), Al-Hajri (2008)
	Strategic aiming and movement toward e-banking in country	Rao *et al.* (2003), Eid *et al.* (2002)
	Codifying standards and indexes related to e-banking	Sarlak *et al.* (2009), Eid *et al.* (2002)
	Existence of appropriate culture toward e-banking in society (trust)	Sachs (2000), Enos (2001), Yousafzai *et al.* (2005), Darch and Lucas (2002), Eid, *et al.* (2002)
	Perceived usefulness by customer (customer awareness)	Sachs (2000), Al-Hajri (2008), Mahmood *et al.* (2008)
	Threatening of technological environment and competitors executing e-banking	Sarlak *et al.* (2009), Rao *et al.* (2003)
	Coordination and cooperation with the other banks in e-banking context	Rao *et al.* (2003), Kuzic *et al.* (2002), Eid *et al.* (2002)

MATERIALS AND METHODS

Research methodology: In terms of its goal this is an application research and regarding the nature and data collection method, it is a survey-descriptive and correlation.

Instrument: Questionnaire and interview have been used in order to study and adjust factors obtained through research literature. For measuring responders view point about factors affecting successful implementation of e-banking, designed 24 items using Likert 5-point ranking spectrum (ordinal) which rated from strongly disagree to strongly agree. Some questions were put at the section 2 of the questionnaires in order to obtain some descriptive information about responding individuals and the rate their bank use e-banking. The questionnaires with research model were given in 15 of e-banking experts (including those who are responsible to e-banking affairs at banks, governmental organizations and college masters) after readying and were confirmed by them after some partial displacements in effective factors classifying and simplifying some questions.

Validity and reliability: At the first step the questionnaire e-mailed 11 banks (17 individuals) which were in different levels considering implementation of e-banking by using of concurrent validity and ambiguous questions were edited at the next edition of questionnaire. Cronbach α correlation were used for evaluation of reliability of the

questionnaire through using 13-person (9 banks) preliminary sample (returned questionnaire). Reliability all over the questionnaire was 0.89 and for co-structural, content and context factors was 0.85, 0.94 and 0.88, respectively.

Data analyzing procedure: Chi-square test (for testing statistical hypotheses) and Friedman analysis of variance test (for ranking dimensions of co-structural, content and context factors) was used for data analysis procedure (Azar and Momeni, 2001). The results obtained at 0.05 α level in this research.

Statistical population: Research statistical population has been made by experts and managers of IT and e-banking in banks of Iran; but because of their expansion they were restricted to experts of Pasargad bank branches (N = 318 bank), the most advanced bank at the field of e-banking. Applying simple random method, questionnaires e-mailed to 103 Pasargad bank (Value derived through computing formula mentioned by Azar and Momeni (2001), was 88 at least) branches throughout the country at winter 2009 that 90 of them returned.

RESULTS

Outcomes of study characterized that 81.1% of the responders are man and 18.9% of them are woman. According to Fig. 1, surveying the education level of responders demonstrates that most of responders hold bachelor degree. Also surveying age of responders demonstrates that their mean age is 34.89 (Fig. 2).

The questionnaire outcomes of study manifests that majority of the responders had less than 10 years work experience in the banking (Fig. 3).

The results of data analysis for testing statistical hypotheses presented in Table 2 demonstrates that the amount of testing statistics is more than critical value in all three hypotheses.

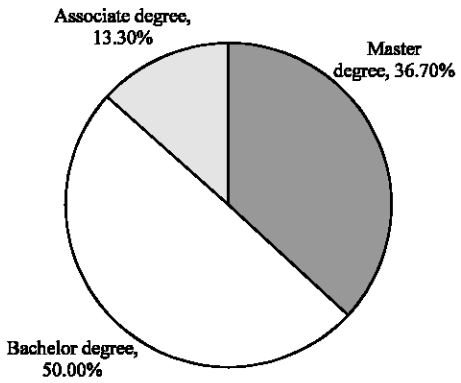

Fig. 1: Education level of responders

Test of first hypothesis: The results obtained through using Chi-square test demonstrate that testing statistic for the first hypothesis is 37.089, shows a significant difference in critical value, i.e., 28.86. Therefore, the first hypothesis is supported and at confidence level of 95% it can be claimed that the null hypothesis accepted, in other word There is a meaningful relation between co-structural factors and successful implementation of e-banking in Iran's banking system (Table 2).

Test of second hypothesis: Considering results obtained in the Table 2 by using Chi-Square test, testing statistic for the second hypothesis 45.444, is more than critical value, i.e., 33.92. Therefore, the second hypothesis is supported, too and at confidence level of 95% it can be claimed that the null hypothesis accepted, in other word There is a meaningful relation between content factors and successful implementation of e-banking in Iran's banking system (Table 2).

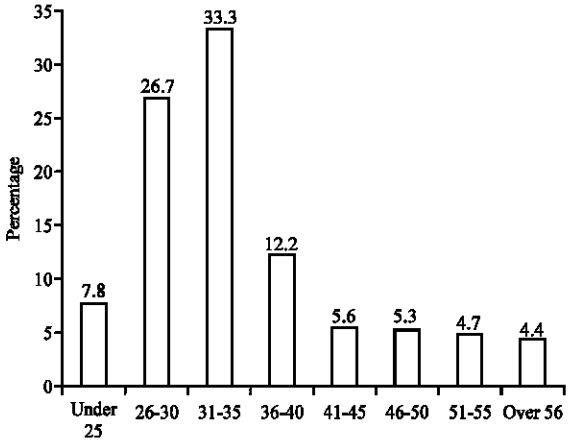

Fig. 2: Scale of responders ages

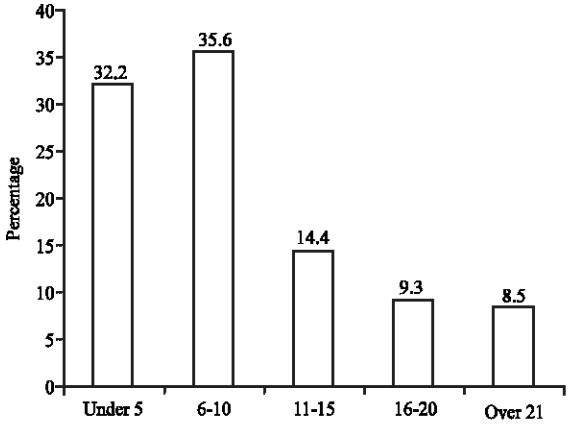

Fig. 3: Work experience of responders

Test of third hypothesis: Considering results obtained by using Chi-square test in the Table 2, testing statistic for the second hypothesis is 44.000 and since it is more than critical value, i.e., 42.55, therefore, the third hypothesis is supported like the two others and at confidence level of 95% it can be claimed that the null hypothesis accepted, in other word There is a meaningful relation between Contextual factors and successful implementation of e-banking in Iran's banking system (Table 2).

Considering Table 2 using Friedman analysis of variance test demonstrate that from the highest to the lowest, co-structural, context and content factors occupy ranks one to three, respectively, in the case of effectiveness intensity on successful implementation of e-banking in Iran's banking system.

Ranking of factors indexes: In this part, more minor factors (indexes) including each factor are ranked by using Friedman analysis of variance test. According to Table 3, in ranking of co-structural factor indexes, following indexes occupy the first three ranks of the dimension: (1) Transforming internal foundations to be effective and integrated in order to provide each customer with unique offering (2) financial sources for investing in E-banking infra-structures and (3) telecommunication, software, hardware and technical infra-structures.

In ranking of content factor indexes, following barriers occupy the first three ranks of the dimension: (1) A user-friendly web-interface and appropriate promotion, (2) efficient and very quick customer service and (3) the data gathered about the customer with any interaction, for good understanding needs and wants of customers (Table 4).

Also in ranking of contextual factor indexes, following indexes constitute the most important three ranks of the dimension: (1) Strategic aiming and movement toward E-banking in country, (2) perceived usefulness by customer (customer awareness) and (3) convenience and customer accessibility to web based services (e.g., computer, high speed internet etc.) (Table 5).

Table 2: Summarized stages of statistical testing of research hypotheses and their ranking

Hypothesis No.	Critical value	Asymp. sig	df	Chi-square testing statistic	Test result	Population mean	Rank Mean	Rank
1	28.86	0.005	18	37.089	H_0 accepted	3.25	2.19	First
2	33.92	0.002	22	45.444	H_0 accepted	2.97	1.79	Third
3	42.55	0.037	29	44.000	H_0 accepted	3.14	2.02	Second

Table 3: Ranking of co-structural effective indexes

Index (barrier)	Rank Mean	Rank
Transforming internal foundations to be effective and integrated in order to provide each customer with unique offerings	4.50	1
Financial sources for investing in e-banking infra-structures	4.43	2
Telecommunication, software, hardware and technical infra-structures	4.09	3
Security of IT systems in e-banking	3.82	4
Presenting a comprehensive website, contain: Corporate profile, product and pricing information, interest rates and application forms etc	3.81	5
Drawing of the Internet market map for the e-banking strategy	3.74	6
Using branding for highlighting e-banking systems	3.59	7

Table 4: Ranking of content effective indexes

Index (barrier)	Rank Mean	Rank
A user-friendly web-interface and appropriate promotion	5.34	1
Efficient and very quick customer service	4.84	2
The data gathered about the customer with any interaction, for good understanding needs and wants of customers	4.76	3
Enough knowledge and cognition of staff on opportunities and benefits of e-banking	4.74	4
Support of head management from implementation of e-banking	4.32	5
Positive view of point into e-banking and existence of innovation motivation among staff and management of bank	4.20	6
Educated and efficient staff in e-banking context	4.01	7
Planning toward training (e.g., ICDL courses) and updating knowledge and skills of staff	3.78	8

Table 5: Ranking of context effective indexes

Index (barrier)	Rank Mean	Rank
Strategic aiming and movement toward E-banking in country	5.40	1
Perceived usefulness by customer (customer awareness)	5.15	2
Convenience and customer accessibility to web based services (e.g. computer, high speed internet etc)	5.11	3
Coordination and cooperation with the other banks in e-banking context	4.99	4
Threatening of technological environment and competitors executing e-banking	4.91	5
Regulations convenience related to e-banking	4.83	6
Existence of appropriate culture toward e-banking in society (trust)	4.78	7
Codifying standards and indexes related to e-banking	3.57	8

DISCUSSION

We conducted a surveying study to get insights into relationships between co-stuctural, content, context factors and the successful implementation of e-banking and found that there is a meaningful relation between these tree factors and successful implementation of e-banking in Iran's banking system.

Each phenomenon should provide some non-alive and physical conditions and elements in order to reach its goals. Co-structural dimension of e-banking is one of the main tools in helping the bank for its implementation. It is evident that implementing of e-banking will not be possible without creating non-human and material factors and substructures. Therefore, existence of infra-structures such as financial sources, security, Transforming foundations and etc. makes it necessary that these infra-structures and systems be in correspondence with methods and different kinds of intra-organizational systems. As a result, strength of co-structural factors as one of the main e-banking successful implementation was expected. Acceptance of the first hypothesis of this research is an evidence for the above-mentioned matters.

Although, e-banking implementation is not possible in case of lack of co-structural and physical factors of the bank, it can be claimed that human is the reason for evolution and advancement of all materials. A creature with different views, character, values, needs and cultures and each of them find different solution for fulfilling their different needs. This is human and its relationships in the bank joining with behavioral norms, unofficial communications and special patterns constitute the main content of intra and extra bank. Therefore, support of head management, knowledge of staff, efficient customer services and etc. can be regarded as serious factors in E-banking implementations. This is the reason for confirmation of content factors hypothesis.

If co-structural variables are supposed as independent variables and content variables as dependant ones, the context variables will be regarded as mediatory ones. And if content variables are supposed as independent ones and co-structural variables as dependent variables, context variables will constitute hidden variables. In both cases, these variables will be regarded as extra organizational variables. This dimension will not only results in survival and growth of the other two dimensions but also creates these two dimensions in the organization. Therefore, factors such as coordination with the other banks, technological environment, customer accessibility to web based services and etc., should be considered for successful implementing of e-banking. As it seems these factors lead to confirmation of context factors in this study.

A review on research literature and studies done in the field of this research makes, it clear that most researchers have carried out case-by-case study in order to find independent variables of the research and finally have presented a list of e-banking implementation factors which constitutes the main fundamentals of this study. Some researcher examine only one dimention of E-banking success factors e.g., Mahmood *et al.* (2006) investigated only organizational success factors in E-banking and extracted some indexes; or Yiu *et al.* (2007) tried to make sense of Internet Banking in Hong Kong from angle the influences of perceived usefulness, perceived ease of use, perceived risk and personal innovativeness in information technology (Technology Acceptance Model). Technology acceptance model are used frequently to exploring E-banking usability by researchers.

Moreover, it seems that classifying of scholars who have studied the set of success factors in the form of multiply categories, does not hold required comprehensiveness and makes it impossible to put most variables in these categories. for example Elissar *et al.* (2009) offered a conceptual model of the adoption of E-banking involved organizational variables, strategic variables and structural variables. We believe Tri-radiate Model is more flexible than this model. Maybe most comprehensive research in this field is accomplished by Stamoulis (2000), suggest an internet commerce market structure model charts the Internet commerce market, by categorizing the role that they various participants, including banks, play in this market (Technology providers, content providers, context providers and Enablers). It is possible to concord content providers with content dimension and context Providers with context dimension. However in our research co-structural dimension include most broader factors, technology providers have been studied in this frame, but Enablers didn't offer as independent dimention in this research and it's indexes investigated under three dimensions.

CONCLUSIONS AND RECOMMENDATIONS

It is widely believed that the impact of e-baking enables banks to provide an inexpensive and direct way of exchanging information and to sell or buy products and services. Recognizing the advantages of e-banking, banks have early and aggressively moved offerings to the e-banking. This study has been tried to give comprehensive complex of effective factors by research literature; summarized and classified factors belike affecting successful implementation of e-banking in the form of tri-radiate Model and these examined on successful banks of Iran implementing e-banking. The findings demonstrate that three main dimensions of

co-structural, context and content factors lead to successful implementation of e-banking in Iran's banking system, respectively.

Implementation of e-banking require the installation of specific telecommunication networks or application software, which can be costly and lack user accessibility and flexibility. In ranking of co-structural factor indexes, following indexes occupy the first three ranks of the dimension: (1) Transforming internal foundations to be effective and integrated in order to provide each customer with unique offerings, (2) financial sources for investing in e-banking infra-structures and (3) telecommunication, software, hardware and technical infra-structures.

In implementation of e-banking, human should not be regarded as a non-alive thing on whom we have dominance and its behavior can be affected through using of physical rules. Banks must be aware which human aspects are important in E-banking implementation. In ranking of content factor indexes, following barriers occupy the first three ranks of the dimension: (1) A user-friendly web-interface and appropriate promotion (2) efficient and very quick customer service and (3) the data gathered about the customer with any interaction, for good understanding needs and wants of customers.

Environmental variables will change co-structural and content factors, willingly or unwillingly. Being aware of external variables affect e-banking Implementation is important. In ranking of contextual factor indexes, following indexes constitute the most important three ranks of the dimension: (1) Strategic aiming and movement toward e-banking in country, (2) perceived usefulness by customer (customer awareness) and (3) convenience and customer accessibility to web based services (e.g., computer, high speed internet etc.).

Considering results, taking co-structural factor as the most important factor affecting successful implementation of e-banking in Iran's banking system into account, it is recommended to related organizations that pay more attention to this effective and try on improving them.

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