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Identification and evaluation of factors affecting the adoption of e-banking in the customers of country's banking system(Case Study: Post Bank)

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Abstract

Today's world has been built on the basis of competition and uncertainty, thus the role of facilitators, such as technology and information technology is undeniable. In this research developed Technology Acceptance Model to identify and prioritizing the factors affecting was used on formation of decision and behavior of customers in adoption of Internet banking of Post Bank. The statistical population consisted of all consumers of Post Bank in Tehran. Total of 400 questionnaires was distributed among community members; ultimately 384 usable questionnaires were coded and were entered into SPSS and LISREL software up to use the analysis of data. Results of factor analysis indicated proper fitting of the model and compliance of extracted factors with designed questions and explained variables in the model of the research. At the inferential statistics level also the results of using single sample T-test and ANOVA Friedman tests often were confirmed research hypotheses. Furthermore were showed the ease of application variable has the most influence on Internet banking adoption and next variables had been in order being applied, the security of private information, being pleasure existence of appropriate hardware and familiarity with Internet banking.

Keywords: *Internet-banking, technology adoption model*

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Introduction

Nowadays customers have high expectations of the banks to offer the services. They demand the new level of comfort and flexibility combined with the power and ease of use of products and services to financial management. Traditional banking is not able to provide these services at this level (Tan and Teo, 2000). E-banking has located many options to use banking services compared to traditional banking at the disposal of the customer and in general, can be said the choice domain of customers has been increased in e-banking. Widespread use of the Internet and financial innovations in e-banking has attracted the attention of scientists in internet banking. In recent years Internet banking has been highlighted as a way to maintain customers' loyalty and increase in market share. The only method of banking services used in traditional banking is the direct referring to the branch and physical presence, while the electronic system, the customer can receive its requirements by using devices such as ATM, POS, Internet, cell phones, telephone, computer Services.

Banking industry like other areas of the services and trade, every day is witness of increasing competition and the presence of new competitors. In recent years the entry of private banks with proper infrastructure, competition is very sensible. Creation of special facilities and special relations with customers that banks and financial and credit institutions are trying to attract or keep them is an effective step for the continuation of life of organization and win in the competition (Sohail et al., 2003). In current developed markets and in the competitive environment, institutions and different companies including banks have come to the conclusion that are based the existing customer. Successful protection of existing customers reduces the need to search for new customers and potential risk, as well as long-term relations with customers will reduce the cost of services due to their awareness. In an era that customers have a lot of choices, service pro-

viders should try to remain in the mind of the customer always (Bruno, 2003; Polasik, 2009).

E-banking

Banking has become to data processing services industry currently. development speed of Informatics' industry has been created major changes in money and banking services systems in the area of banking and the new concepts has been created such as Digital Money, automatic Teller machines, as well as new phenomena under the titles of home banking, telephone bank, remote banking, Internet banking and virtual banking (AllahyariFard, 2005). Different definitions have been presented to e-banking that is referred to an item:

- E-banking is the use of electronic tools, including the internet, wireless communication networks, ATM, telephone and mobile phone, in providing banking services and products that are part of financing in the monetary and financial system of the country (Abbas Nejad, M., 2006).

Advantages of e-banking

The advantages of e-banking can be considered from two aspects customers and financial institutions. From the perspective of customers can be named the saving at costs, time savings and access to multiple channels for banking operations from the perspective of financial institutions can be named the features such As creation and enhancement of the reputation of banks in providing innovation, customers retention, despite the spatial variability of banks, creating the opportunity to search for new customers in target markets, expanding the geographical range of activity and establishing conditions of perfect competition. Following the major channels to provide e-banking services has been mentioned to customers: Home banking, web pages, automated teller machines (ATM), machines Electronic Funds Transfer at the Point of Sale (EFT-POS), phone banking, TV-based banking services, mobile phone banking and Internet banking (AllahyariFard, 2005).

Importance of e-banking in the world and

Statistics population and Internet users of the world in 2014						
Region Name	Population (2014 estimation)	Internet users December 31, 2000	Internet users of latest data	penetration rate (percentage of population)	Users growth from 2000 to 2014	Universal user
Africa	1125721038	4514400	297885898	26.5%	6498.6%	9.8%
Asia	3996408007	114304000	1386188112	34.7%	1112.7%	45.7%
Europe	825824883	105096093	582441059	70.5%	454.2%	19.2%
Middle East	231588580	3284800	111809510	48.3%	3303.8%	3.7%
North America	353860227	108096800	310322257	87.7%	187.1%	10.2%
Latin America Caribbean	612279181	18068919	320312562	52.3%	1672.7%	10.5%
Oceania Australia	36724649	7620480	26789942	72.9%	251.6%	0.9%
The whole world	7182406565	360985492	3035749340	42.3%	741.0%	100%

▲ Table 1. General statistics of the status of Internet users and penetration rate and growth of the internet globally

Year	Number of users	population	% population	Source
2000	250000	69442905	3.8	ITU
2002	5500000	69442905	7.5	ITU
2005	7500000	69442905	10.8	ITU
2008	23000000	65875223	34.9	ITU
2009	32200000	66429284	48.5	IWS
2010	33200000	76923300	43.2	IWS
2012	42000000	78868711	53.3	IWS

▲ Table 2. Demographics and the growth of internet users in Iran

Iran

With the development of technology and the spread of the Internet, taking advantage of internet network opportunity to providing services in the Internet, has been caused the Internet to be considered as the main prerequisite for e-banking. As a result, Internet penetration in the countries also known as Readiness Index is necessary circumstance for the realization of e-banking. So at this part initially has been look to the condition of internet users in worldwide and Iran.

Table 1 has been provided comprehensive in-

formation on the status of Internet penetration and its growing trends in different regions of the world. As can be seen the number of Internet users in period of ten years from 2000 to 2014, has growth of 741 percent and by average annual growth rate of about 52 percent now internet users nearly are three billion people worldwide, that the penetration rate of the whole world is about 42 percent. During this period of 14 years Middle East region after the Africa with 3303 percent have had highest growth in terms of number of Internet users (taken from the Internet World Stats

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site, 2014).

According to the data in Table 2, Iran has a significant share in achieving this growth rate by increasing the 168 times of the number of Internet users during the said period. However, despite this significant growth penetration rate in this region is still equal to 48.3 percent that in this sense is in fifth place among the regions in the whole world (taken from the Internet World Stats site, 2014).

Using the Internet has been widespread in the whole world for do banking affairs. Because the statistic was not available in this field that to be related to the years of 2013 and 2014, therefore, it was limited to the statistics of the countries of the Europe Union. The latest report in year of 2014 the official website of the Union of Europe show that on average 47% of people have benefited of Internet banking in the member states. This rate has obtained for people in the age range of 16 and 74 years old. Based on these results, internet banking among the countries of North Europe and Scandinavia have been accepted by many; So that more than 50 percent of users of those countries (Iceland, Norway, Finland, Denmark, Netherlands, Sweden, Estonia, Luxembourg, Belgium, France, Latvia, England, Switzerland and Lithuania) have used the Internet for banking affairs (site Union official Europe, 2014).

The situation of e-banking in Iran

Although automatizing the banking operations were began in Iran since the '1960s and with establishment of mainframes in the central part of the bank some limited actions were conducted in this field; but implementation of automation plans of banks returns to middle years of the 80s. In this decade according to the arrival of personal computers and the need feeling to automation of banking operations, Iranian banks started their activities in this field too. Introduction of new electronic payment instruments returns to 1991 and start of the service of ATM SepahBank which provided the first sample of the cards with withdrawal

capability from ATM terminals for banking network customers (Abbasinezhad and Mehnoosh, 2006).

The network of banking cards in Islamic republic of Iran with starting the activity of information exchange network between the banks (acceleration) has been acted seamlessly as national switch of the card from 2002. By creation of acceleration center more effective steps were taken in order to achievement of connection of payment network of banks to each other and finally to do interbank exchanges electronically (Allahyarifard, 2005).

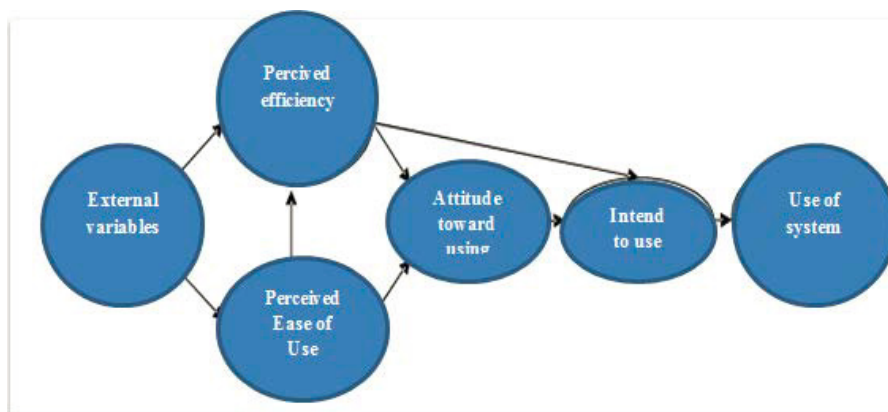
Acceptance theories

Among available models in technology acceptance field in this part just evaluation of a model has been mentioned. Technology acceptance model is a model that explains the way of technology acceptance by people in doing their activities. This model is the first model that has been presented specifically to evaluate way of information technology acceptance. Technology acceptance model originally includes explanation and connection between perceived ease of use (PEOU), perceived usefulness (PU), attitude toward using, behavioral intention to use (BIU) and real use. Customers' perceived of usefulness and ease of use are two determinant and important factors in real use of the system and behavioral intention to use that (Wu & Wang, 2006). In fact these two perceives and perceptions are the predictors of attitude toward using and technology acceptance (Mathieson et al, 2001).

In this research it has been tried to evaluate effect of other factors such as perceived enjoyment (enjoyable), familiarity with e-banking, private information security (trust in internet banking) and existence of appropriate hardware on behavioral intention of Customers toward use and acceptance of internet banking in Postbank by improvement and localization of this model.

Research history

In the part of researches because of high volume of conducted researches just two re-



▲ Figure 1: Technology Acceptance Model of Davis

searches have been mentioned in each part.

-Ilias Santouridis, Maria Kyritsi research (2014): they have evaluated effective factors on internet banking acceptance among banking customers of Greece. Data analysis showed the significant effect of usefulness and ease of use in relation with internet banking. Also innovation and creativity of website and also satisfaction from ATMs were important for customers.

-Salva Daneshgadeh, Sevgi Özkan Yıldırım (2014): they have evaluated effective factors on internet banking acceptance among banking customers of Turkey. They designed a model and evaluated ten factors on usefulness, ease of use, control, social effect, complexity, risk, site features, services, services informing and personalization. The results of the primary model showed that the complexity has the most effect and after that the services, usefulness, personalization and ease of use were effective.

-Rasoul Sharifidorabad and others (2013): in this research DEMATEL and analysis of network process techniques have been used to determine and prioritize effective factors on internet banking. Effective factors on internet banking acceptance include: profitability, ease of use, availability, trust and perceived risk.

-MA thesis of Amina Rahnema (2013): bases on obtained results from hypotheses test with SPSS; all hypotheses of the research have

been confirmed so that attitude, perceived profitability, perceived behavioral control and mental norm have significant relationship with intention to use of Customer from internet banking. Perceived profitability, ease of use and resistance to change have significant relationship with attitude of Customer toward internet banking. Computer self-efficacy and technology support have significant relationship with perceived behavioral control and computer self-efficacy has significant relationship with perceived ease of use.

Methodology

This research is descriptive due to the nature and according to the purpose is applied research and based on the method of carrying out is survey. Data collected has been analyzed by questionnaire through statistical methods by SPSS and LISREL software. In this research descriptive statistics has been used to display demographic information. For this reason, demographic characteristics data have been shown by using frequency tables and bar sampling. In part of Inferential statistics, t-test for being significance of the data and Friedman test for ranking factors have been used in order to test research hypotheses as well as Mean of two societies test and one factor variance analysis test to evaluate the effect of moderating variables (Skaran, 2002).

Research objectives

- Identification and assessment of factors af-

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fecting adoption of internet banking from bank customers.

- prioritizing the factors influencing the adoption of Internet banking.

identification and prioritization of these factors can contribute the bank managers to the development of appropriate strategies and also possibility for better planning to offer these new services in a way that have had more matching with the demands and needs of customers to be provided for bank.

Research Hypotheses

First hypothesis: "applicability" has a positive effect on the adoption of Internet banking.

Second hypothesis: "ease of use" has a positive effect on the adoption of Internet banking.

Third hypothesis: "pleasurable" has a positive effect on the adoption of Internet banking.

Fourth hypothesis: "Familiarity with e-banking" has a positive effect on the adoption of Internet banking.

Fifth hypothesis: "the security of private information" has a positive effect on internet banking adoption.

Sixth hypothesis: "The existence of appropriate hardware" has a positive effect on internet banking adoption.

Research statistical population

The statistical population includes all customers of Post Bank in Tehran city and sampling method is clustering and is available in each cluster randomly. According to the municipal classification, Tehran has been divided into 22 regions. 7 regions have been selected randomly to select samples and then customers of two branches have been selected in each region randomly. Due to the unlimited number of customers 384 samples has obtained by using Morgan table for this purpose a total of 400 questionnaires were distributed and 384 valid questionnaires were collected ultimately. The main part of questions consists of 28 closed questions. This question has been designed to measure each of the independent variables

of the research model. One five-point Likert scale has been used for questions of this part. a sentence has been given in each question of this part and it has been asked of the people to express their degree of agreement with each of the questions (1 = very low to very high = 5). In relation to the questionnaire, its validity has been assessed and reliability has been confirmed by Cronbach's alpha and it has been measured by using research model factor analysis finally (Klein, 2001).

Research variables

Usefulness: it is referred to the person's belief in the usefulness of the system and its effect on the efficiency of the performance that have been described in internet banking as savings in cost and time specifically (Pikkariainen, 2004). **Ease of use:** it is related to ensure amount of person from ease of learning and the use of specific system, which means that a person with normal education can easily use online banking services. **Pleasurable:** fun, refers to the extent to which the use of online banking service by itself to be perceived enjoyment feeling, it (Davis et al., 1992). This factor unlike the usefulness of which is an external motivation has been defined an inner motivation for using Internet banking.

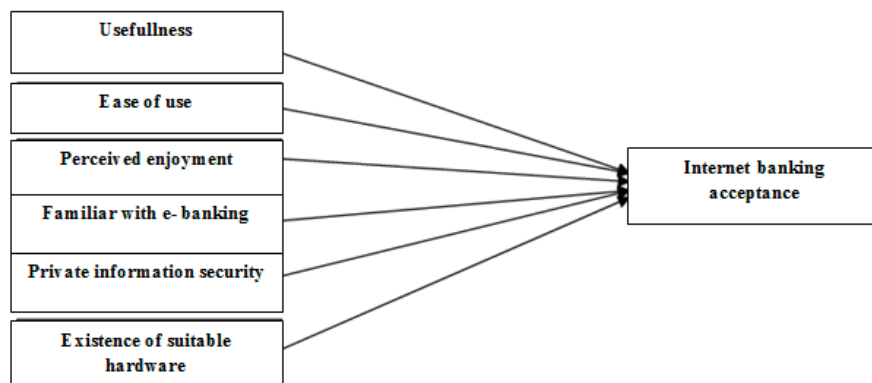
Familiarity with e-banking: it is amount of information that a person has about benefits, features and Internet banking services.

Private Information Security: they are safe, secure and confidentiality of multidimensional structures that in this model, only have been focused on aspects that customers have most concerns and distrust in this area.

The existence of suitable hardware: it implies to the availability of suitable hardware and software and pay attention to the fact that may not use the internet banking services without a proper connection (Pikkariainen et al., 2004).

Research Model

As it was explained, it is visible in the model two main variables related to Technology Acceptance Model means usefulness and ease of use with four variables of Perceived enjoy-



▲ Figure 2. Conceptual model of research

Experience of using the internet banking	Frequency	Frequency Percentage
I do not use	150	39.1
Less than 1 year	154	40.1
More than 1 year	80	20.8
Total	384	100

▲ Table 3. Frequency distribution related to the experience of using the internet banking of respondents

	Very high	High	Average	Low	Very low
Notification of account balance	%27	%30	%25	%13	%5
Receiving the last workflow and invoicing	%24	%29	%27	%15	%5
Bill payments	%38	%32	%20	%8	%2
Money transfer	%29	%41	%22	%6	%2

▲ Table 4. Study on community feature in terms of the status of using the internet banking services

ment, familiarity with e-banking, security of private information and presence of suitable hardware are six independent variables. That has effect on dependent variable of the research means acceptance and use of e-banking is impressive and type of behavior and decision of customer can be predictable by them.

Research findings

Table 5 shows the descriptive statistical indexes such as central and distributive indexes. According to the means of the research variables ease of use variable had been with more mean and in terms of people has obtained more score.

Due to normality of the data and conducted

tests, parametric tests have been used in examine the hypotheses.

Confirmatory factor analysis

Before the examining relationships among research variables, at first must be ensured the validity of each of the research variables. Factor loadings of the model in the standard estimation show the effect of each of variables or items in description and explanation of the variance of variable scores with main factor. In other words, the factor loading shows the correlation of each observer variable (question of questionnaire) with latent variable (factors). Hence by using LISREL software and confirmatory factor analysis, the fitting indexes

	Usefulness	Ease of use	Enjoinment	familiarity	Security	Hardware
Number	379	379	379	383	383	383
Average	3.574	3.830	3.473	2.845	3.552	3.398
Standard deviation	0.986	0.908	0.843	0.745	1.042	1.017
Variance	0.972	0.824	0.71	0.555	1.087	1.034
Skewness	-0.638	-0.854	-0.687	0.117	-0.642	-0.436
The standard error of Skewness	0.125	0.125	0.125	0.125	0.125	0.125
kurtosis	-0.303	0.14	-0.044	0.802	-0.236	-0.424
Standard error of kurtosis	0.25	0.25	0.249	0.25	0.249	0.249

Table 5.Descriptive statistics of the research variables

of the model indicate that the model in terms of proportion and fitting indexes is in good condition; Because proportion of chi-square on degree of freedom (χ^2 / df) is equal to 2.81, which is less than the allowed amount of 3 and amount of the mean square of errors (RMSEA) is also equal to 0.069, which is lower than the maximum allowed of 0.08. Also the NFI, CFI, IFI indexes are respectively, 0.95, 0.97 and 0.97, which shows the suitable fitting of the and to measure the research variables are appropriate indexes.

Testing research hypotheses

Null hypothesis in average parametric test of a community due to Likert scale is as follows:

Hypothesis testing:

H_0 : (Null hypothesis) $\mu = 3$

H_1 : (Opposite hypothesis) $\mu \neq 3$

Test results for the first hypothesis have been presented as a table, but the other hypotheses have been brought only by word.

According to T-statistics value equal to 11.334 that is greater than 1.96, in result of usefulness on internet banking acceptance has positive effect and the first hypothesis is confirmed. For the second hypothesis, T statistic value equal to 17.797 is greater than 1.96. As a result, ease of use has a positive effect on the acceptance of internet banking and the second hypothesis is confirmed. For the third hypothesis, T

statistic value equal to 10.982 that is greater than 1.96. As a result, perceived enjoyment has positive effect on Internet banking acceptance and third hypothesis is confirmed. for the fourth hypothesis, T-statistic value equal to -4.042 that is smaller than 1.96. As a result, familiarity with e-banking has no positive effect on Internet banking acceptance and the third hypothesis is rejected. for the fifth hypothesis T statistic value equal to 10.367 that is greater than 1.96. As a result, the security of private information has a positive effect on internet banking acceptance and fifth research hypothesis is confirmed. for the sixth hypothesis, T-statistic value equal to 7.664 that is greater than 1.96. As a result, the existence of suitable hardware has a positive effect on internet banking acceptance and research sixth hypothesis is confirmed.

Prioritization of variables

Friedman test has been used order to prioritizing the research variables.

As it is specified in Table 8 ease of use variable has maximum effect Internet banking acceptance customers in terms of customers. In addition, other variables respectively usefulness, security of private information, Perceived enjoyment, existence of suitable hardware and familiarity with e-banking are variables that are important in view of customers.

	Number	Mean	Sd	Deviation from the mean error
Usefulness	379	3.574	0.986	0.051

▲ Table 6. one sample statistics of the first hypothesis

Test Value = 3						
Usefulness	T	Degrees of freedom	Significant Coefficient	Mean difference	confidence degree of 95%	
					Low level	High level
Usefulness	11.334	.78	0.000	0.574	0.475	0.674

▲ Table 7. one-sample test of first hypothesis

Rank	Variables	mean of ranking
1	Ease of use	4.45
2	usefulness	3.79
3	Private information security	3.6
4	Perceived enjoyment	3.43
5	The existence of suitable hardware	3.37
6	familiarity with e-banking	2.35

▲ Table 8. Ranking the components by using Friedman test

12.4 effect of moderating variables on internet banking acceptance

Mean comparison of two community test has been used to investigate gender on research variables. According to the scores obtained from the sample and performing two community test claim of inequality of mean of familiarity with e-banking in the two groups of male and female in the error level of 5 percent is rejected and gender has no effect on familiarity with e-banking. But in other research variables the significant level is smaller than 5% and claims of inequality of mean of usefulness in the two groups, male and female in error level of 5 percent is confirmed.

ANOVA test (ANOVA) is used to investigate the effect of age and education on the research variables. Due to obtained tables sig value for the variable of familiarity with e-banking in both age and education variables are greater than 5%. As a result, age and education has no significant effect on familiarity with e-banking but for other variables sig value is less than 5%

and shows the effect of age and education on these variables.

Conclusion and suggestions

According to test results of the research hypotheses and confirm of 5 hypotheses from 6 hypotheses of the research it can be said that most of the predicated variables in this research have been recognized as the effective factor on formation of Customer's behavior and decision to accept and use internet banking of Postbank. Also to answer the second question according to results of Friedman test it was observed that there is significant difference between ranks of effective factors on internet banking acceptance by customers. Also it was observed that ease of use variable has the most effect on internet banking acceptance so according to mentioned cases following cases are suggested:

- Website to be designed in a way that learning and use process of banking services become simple for customers.
- In terms of usefulness the fastest method of

providing services with available possibilities and infrastructures to be provided for customers as much as possible.

- Variety of providing services through internet and exploitation from advantage of removing time and place limitation in services providing to be considered in an effective way in designing and providing internet banking services.

- using presentable services by this channel to have high flexibility and in the other word the most possible services have doing capability with spend the least time.

- The required trust and confidence to be given to customers that in internet banking the personal information and privacy of people are protected such as traditional banking.

- The required information to increase awareness and trust and confidence coefficient of customers to be provided in the field of used technology in internet banking.

- In appropriate and continuous ways to be tried to evaluate the satisfaction amount of customers and recognition of creating factors of dissatisfaction in customers.

- doing suitable and effective advertisements to increase awareness of all potential customers in the target market can be effective on increase of people's familiarity amount and internet banking acceptance rate.

- try to increase awareness amount and familiarity with types of internet banking services and topics related to them will have a great share in formation of people's belief to advantages, ease of use feeling, usefulness feeling and confidence from privacy protection.

- continues planning to be considered to increase the speed of doing customers' works and reduce internet connection barriers.

- Enough awareness and confidence to be provided in safety, password, protocols and applied mechanisms fields.

- according to the Postbank place, market share and customers' combination and... the results of this research cannot be generalized easily to all banking system of the country. So conducting a similar research in other banks and

if it is possible in some state and private banks can provide more generalizable and comprehensive for banking system managers and researchers.

- According to limitations and bottlenecks of conducting a research individually and vacancy of conducting research to recognize effective factors on acceptance by demand in the banking system level and share of the potential market of internet banking and in order to operational exploitation from its usefulness results, doing above suggestion are recommended in the form of a team work.

- conducting complementary researches is recommended to expand the model of this research with the purpose of recognition of other effective factors on acceptance by customers.

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