INVESTIGATE THE EFFECT OF ELECTRONIC PAYMENT SYSTEM COMPONENTS ON PERCEPTUAL USEFULNESS BY USING STRUCTURAL EQUATION MODELING (SEM)

INVESTIGAR EL EFECTO DE LOS COMPONENTES DEL SISTEMA DE PAGO ELECTRÓNICO EN LA UTILIDAD PERCEPTIVA MEDIANTE EL USO DE MODELADO DE ECUACIÓN ESTRUCTURAL (SEM)

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Abstract: *The objective of this research was, investigating the effect of electronic payment system components on Perceptual Usefulness by using Structural Equation Modeling (SEM). The method of this study is cross-sectional that is done as field research. The statistical population are the customers of the Bank of the city, in which 384 people were selected randomly as sample. The researcher made questionnaire with 30 items was used for data gathering. Validity of the questionnaire was confirmed by specialist professors and its reliability was confirmed by Cronbach's alpha. Structural Equation Modeling (SEM) using LISREL software were used for data analysis. Results indicated that, the components of electronic payment system have impact on perceptual usefulness of City Bank from the view of customers.*
Keywords: *electronic systems, perceptual usefulness, customers*

Abstracto: *El objetivo de esta investigación fue investigar el efecto de los componentes del sistema de pago electrónico en la utilidad perceptiva mediante el uso de modelos de ecuación estructural (SEM). El método de este estudio es transversal que se realiza como investigación de campo. La población estadística son los clientes del Banco de la ciudad, en los que se seleccionaron 384 personas al azar como muestra. El investigador hizo un cuestionario con 30 ítems para la recolección de datos. La validez del cuestionario fue confirmada por profesores especialistas y su confiabilidad fue confirmada por el alfa de Cronbach. El modelado estructural de ecuaciones (SEM) utilizando el software LISREL se utilizó para el análisis de datos. Los resultados indicaron que los componentes del sistema de pago electrónico tienen impacto en la utilidad perceptiva de City Bank desde la perspectiva de los clientes.*
Palabras clave: *sistemas electrónicos, utilidad perceptual, clientes*

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Introduction

Access to World Wide Web and its development has created a revolution in "one-to-one "and "one-to-many" communications across the world. We can surely say that the world never has witnessed such a revolution to use a scientific phenomenon. Access of a large number of people to internet and extending electronic communications between people and various organizations via virtual world, has provided a good ground to establish economic and trade transactions. E-commerce and electronic banking can be good examples of this phenomenon (Aslahi, 2014).

One of the essential tools for the implementation and development of e-commerce, is e-banking system that has facilitated the science and activities related to e-commerce, along with global financial and monetary systems. In fact, we can say that e-commerce implementation, requires realization of e-banking. Generally saying electronic banking is "Providing facilities for employees to increase their speed and efficiency in providing banking services at the location of bank branches as well as interbank processes across the world and providing hardware and software facilities to customers, that by using them, they can be able to do their banking operations, without physical presence at the bank, at any time of day via a secure and reliable communication channels".in other words e-banking is including using advanced software and hardware technology based on network and telecommunications to electronic financial information and resources exchanging that can lead to removing physical presence of the customer at the branches of the bank. At present time dramatic transformations has occurred in the requirements of the customers and an extensive section of this changes depends on technological developments and information technology. However, organizations are not safe from these changes and are benefited low and more from fundamental electronica changes. Nowadays can be found a person who is not familiar with the subject of e-banking. The increasing growth of technology, especially information technology in the world, is reduced the space and time barriers and access to internet made possible the business via internet and e-banking and business electronic has a special position in the developed countries (Azizi Far, 2014).

A paper entitled with "Analysis of the impact of service quality on customer satisfaction in the banking industry" by Hossein Gazor and his colleagues was done in 2011. The results showed that the service quality of systems and customer satisfaction are the most optimum factors based on what customer's think.in addition, responding to customers and employee loyalty, the quality of services and service and loyalty to the organization, are the next levels, respectively.

An article entitled with "The relationship between perceptual usefulness, perceived ease of use, quality of perceived information and willingness to use e-government "that is done in 2010 by Soud Almahamid

Et al and its basic goal was exploring the empirical relationship between perceived usefulness, perceived ease of use, quality of perceived information and willingness to use e-government to collect information and conduct transactions by the Jordanian citizens. The sample consisted of 118 men and 57 women who are aware of e-government services. The results showed that the e-government system, is useful, convenient and has high-quality information and there is significant relationship between perceived usefulness, perceive ease of use, the perceived quality of information and willingness to use e-government to collect information and doing transaction by Jordanian citizens. Internet has been able to provide a suitable and favorable ground to establish trade and economic exchanges. Banks as an important element in economic structures and financial systems, along with to keep pace with global developments, they should be the sources to new changes. With a view that IT is used as an effective tool in financial institutions and using these tools should act in such a way that in addition to the satisfaction in their customers, not separated from the daily technology (Farajian, 2006). Today, retain customers and increase customer loyalty in a competitive environment of field service, every day becomes more difficult and providing the quality of services will be the main challenge for companies of providing services, especially banks (Ali Mohammadi, 2002).

In the banking system, fast performance of works and no waste of time, are as the most important element of success in the Banks competition and the customers as the crucial pillars of competitiveness, have more value for technology and speed in the next degree of technical expertise of banks. Thus, in the current competitive market, that is along with the establishment

of foreign banks in the country and the privatization of many state-owned banks, the banks should as fast as think about keeping their customers. According to the above explanation, the purpose of this study was to evaluate the effect of components of electronic payment on the usefulness of the users.

The conceptual model of the research

The research model is based on the success model of information systems of Delon and McLean. These researchers have studied the criteria of about 180 previous studies in the field of success of information systems and at the end provided in 1992 different studying standards in the six dimensions of quality in the name of the Web Site Information quality, system quality, system use, user satisfaction, individual impact and organizational effectiveness. The relationship between these 6 dimensions of the model is as that the quality of system and the quality of information, would affecting lonely or jointly, the satisfaction of the user and use of system.in addition, the value of using system can negatively and positively affect the satisfaction of the user. Of course, the relationship exists on behalf of user satisfaction toward using of the system. This means that the user's consent, affects using system by him. System use and user satisfaction directly affect the personal impact and ultimately the next individual impacts, has organizational impacts. However, the researchers did not provide a clear link between the quality systems and quality of information.

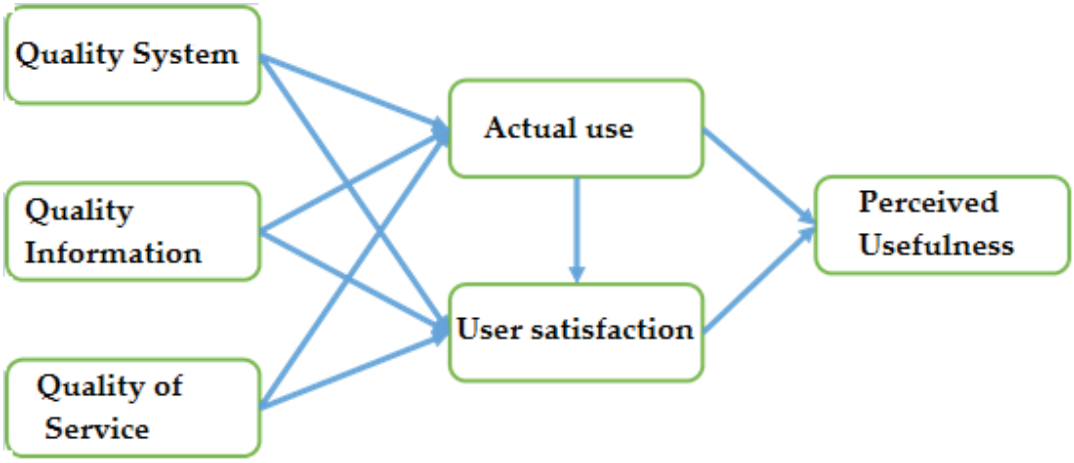

Figure 1: The conceptual model: comes from updated model of the success of information systems of Delon and Mclean.

Methods

The method of this research, in terms of plan is descriptive-analytical and in terms of data collection is the field research that includes gathering initial data or new information from the subjects with methods such as observation, questionnaire, interview and ....

The population of this study are customers of bank branches in Tehran Province. In this study, a simple random sampling method is used. In this study, the statistical population is infinite. For statistical population with 25000 people and 5 percent accuracy, the sample size of 384 is suggested (Mirzaee, 2009). Thus the sample size in this study is 384 people.

In order to data collection for literature of the research the library method (including study books, articles, journals, domestic and international Conferences and Seminars and research and report documentations) and to data collection for review and explain the impact of consumer attitudes on perceived usefulness of the components of electronic payment systems Bank of Tehran city, the field method is used.

In this study, in order to collecting the views of customers of banks in Tehran, the researcher-made questionnaire is used that includes 30 items which comprises measuring system quality, information quality, service quality, use, user satisfaction and perceived usefulness and the questionnaire has been classified from very low to very high in Likert 5- option scale.

To investigate content validity, the questionnaires delivered to relevant experts, including the

supervisor, consultant, and the number of instructors to provide their comments and suggestions about the content of the questionnaire items appropriate for the purpose of research. After receiving the questionnaire, the proposed amendments were considered by experts in order that the questionnaire would have the required content validity. To assess the reliability of measurement tool, Cronbach's alpha using SPSS software is used for a question related to any variable. Cronbach's alpha coefficient in this study was obtained, more than 70 hundredths that is acceptable. Various descriptive and inferential methods was used for data analyzing and LISREL software is used to establish causal relationships of independent variables and the dependent variables. One of the strongest and most appropriate analysis methods in the studies of behavioral and social sciences is structural equation because the nature of these issues, is multivariate and cannot be solved with bivariate methods. This method or methodology, is intricate and complex combining mathematical and statistical method of multivariate multiple regression that is gathered in a complex system to analyze a sophisticated phenomenon.

Results

Description demographic data

The results of obtained data shows that in this study: 68 percent of respondents are men and the other are women.61.7 percent of respondents are men and the others are women. About 11.7 percent of subjects are less than 30 years old, 47.9 percent of subjects are in 31-40 years old, 28.6 percent (41-50) and remained are more than 51 years old. The educational degree of about 13.8 percent of respondents is less than diploma degree, 46.6 percent have associated degree, 28.6 percent have bachelor degree and 10.9 percent have MA degree.

Description Research variables

According to Table 1 it is evident that: the variable of system quality has less value and the variable of quality of services have the maximum value.

Table 1: Description Research variables

	Mean	Standard Deviation	Sample Variance	Range	Minimum	Maximum
The quality of information	1.86666667	0.551033525	0.303637946	3	1	4
The quality of system	1.85199628	0.803431541	0.645502241	4	1	5
The quality of services	2.15260417	0.837965639	0.702186412	4	1	5
Real use	1.9703125	0.70762642	0.50073515	4	1	5
User satisfaction	2.07204861	0.688725545	0.474342877	3.333	1	4.333
Perceptual usefulness	1.966579861	0.660082802	0.435709305	3	1	4

The conceptual model in the SmartPLS

Structural equation modeling is a comprehensive statistical approach to test hypotheses about the relationship between the variables of an observed and latent variables. Through this approach, it is possible to test the acceptation of theoretical models in certain communities using data, non-experimental and the test pilot.

Structural equation modeling results are presented as a path diagram. Path diagram is a graphical representation of structural equation models that include three main components of this graphs, SW of rectangles, Oval and arrow. After presenting the basic model by using structural equation modeling analysis, is one of the most controversial aspects of the reform model. Correction

of model requires the adjusting an expressed and estimated of a model that is done via realizing parameters that previously were fixed or fixing parameters that previously released. In this case, it is possible to remove the parameters that is not significant in the model and improve the model.

When a model estimated, the software publishes a series of statistics such as standard error-value etc. about evaluating fitness of model with data. If the model is testable, but is not adjusted with data properly, Modification Index that is a valuable tool to evaluate, considered changes in representing model, in order that the model be fitted with the data.

The following figure in conceptual model in SmartPLS software, suggests relationship between defined factors in the study. The conceptual model indicates relationship between variables that its false or right not tested with empirical data.

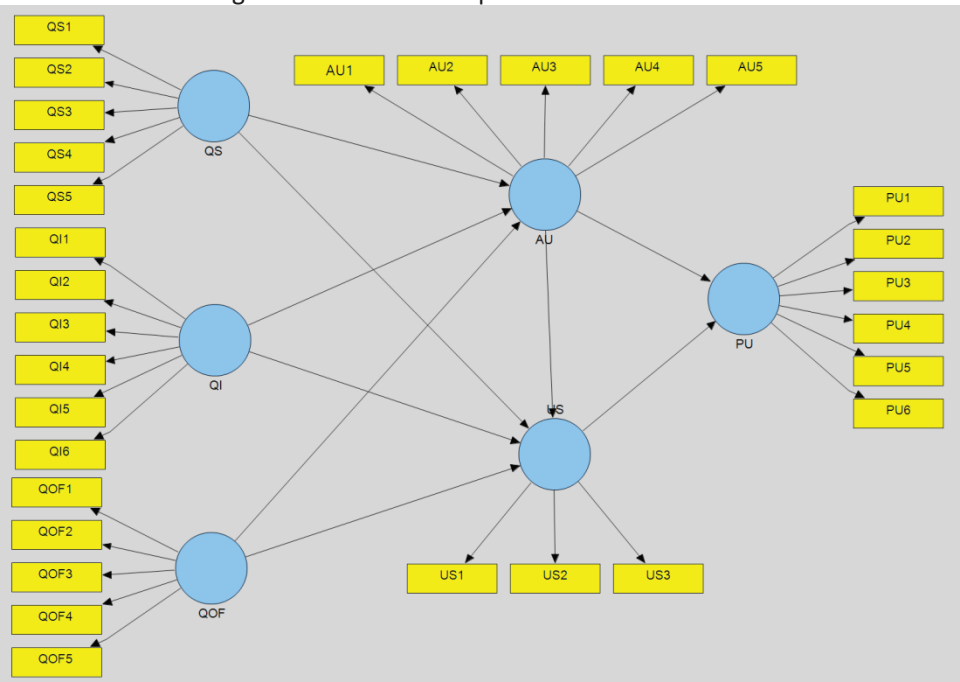

Figure 2: Conceptual Model in the Software

Testing the structural model in PLS

The validity and reliability of estimates of external model allows the evaluation of model estimates of the inner track. An essential criterion for assessing the structural model coefficient of determination (R^2) is of endogenous latent variables. Chin (1998), described the values of 0.67, 0.33 and 0.19 for endogenous latent variables as significant, medium and weak, respectively. If certain internal model structures of endogenous latent variables be explained only by2 or 1 exogenous latent variable, the medium R^2 0.33 is acceptable. But if endogenous latent variables are dependent on exogenous variables, the value of R^2 must be at least in the 0.67 level. The coefficient of determination values for hidden dependent variables of the study shown in Table 2.

Table 2: the values of the coefficient of determination

Hidden dependent variables	
Perceptual usefulness	0.938
Realistic use	0.808
Satisfaction of the user	0.909

The meaningfulness of path coefficients

Individual path coefficients are interpreted of the structural model PLS as beta standardized regression biomarkers coefficients (OLS). Structural routes, which are marked in accordance with algebraic symbols assumed earlier, assuming partial experimental validation of the hypothesized relationships between latent variables. The routes that have the contrary algebraic symbols, are not supporting the assumptions of the researcher. Re-sampling methods such as bootstrapping

or Jackknife should be used in order to determine confidence interval from path coefficients and inferential statistics.

Jackknife: This method by removing a certain numbers of units of the original sample (size N) is re-instantiated. This method as default removes one unit at any time, which cause that each of the sample of Jackknife would be created in N-1 unit at any time. Increasing the number of deleted units leads basic decrease in the strength of the t-statistic because it reduces the number of sub-samples.

Bootstrap: Bootstrap samples unlike previous methods, are created via the re-sampling methods with replacing the original sample. This method builds some instances as the same original sample size.in the PLS method the number of re-samples can be determined. Its default value is 100 samples but the more number like 200 leads to achieve more logical standard error. Some researchers have suggested a number of 500 samples (Temme et al)

Here in the bootstrap method from raw data, for each path coefficient between each of the latent variables in the model a value of T is obtained that analyzing of these values is as: in the 95 percent confide3nce, 95 percent and 99 percent of this value is compared with minimum t-value of 1.64, 1.96 and 2.58. This means that if the observed T-value is more than 1.96 with more than 0.95 percent confidence shows the obtained relationship related to the model.

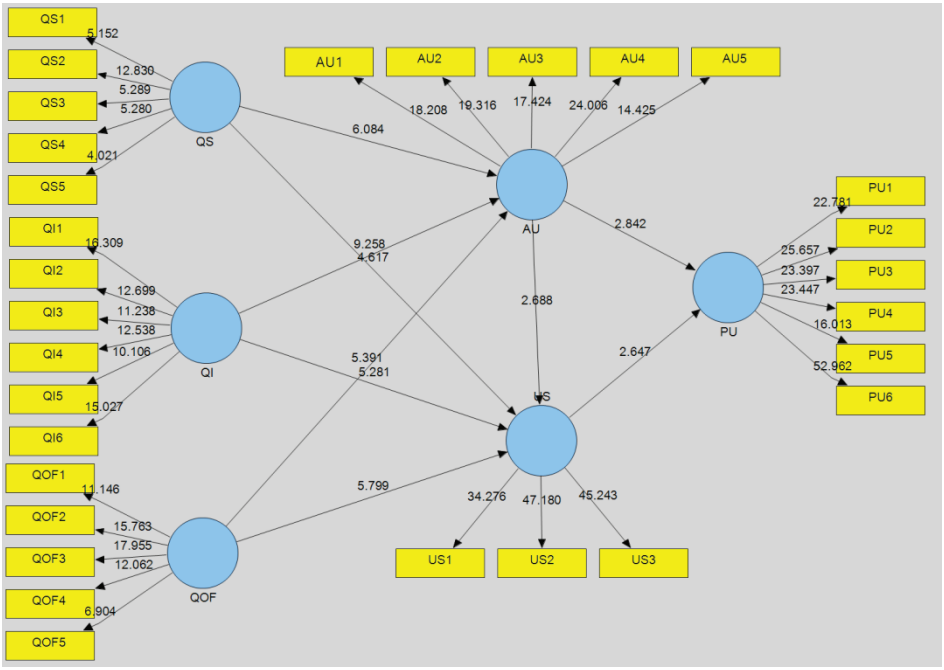

Figure 3: the tested model of the research (the value of t-statistic of path coefficients and the loading factor)

In Figure 3, the explicit and implicit variables and also the path coefficients and factor loadings are shown. The figures that is observed in the latent variables of the model (the variables which are shown with an oval shape) and explicit variables (the variables with rectangular shape that are sub-components of latent variables) are indicating factor loadings. The relationships that are defined between latent variables are research hypothesis and the numbers shown on this relationship, are the path coefficients.

Investigating the hypothesis of the research

First hypothesis: Examination of the quality information and the actual use

Statistically, the first hypothesis expressed in this way:

H_0: The quality of information does not effect the actual use of the electronic payment system (VoIP),

H_1: the quality of information has impact on actual use of the electronic payment system

(VoIP),

As well as for other Research Variables H1 hypothesis is as follows:

- The quality of system has an effect on actual use from the electronic payment system
- The quality of services has an effect on actual use from the electronic payment
- The quality of information has an effect on actual use from the electronic payment
- The quality of information has an effect on user's satisfaction from the electronic payment
- The quality of system has an effect on user's satisfaction from the electronic payment
- The quality of services has an effect on user's satisfaction from the electronic payment
- The actual use has an effect on user's satisfaction from the electronic payment
- The actual use has an effect on perceptual usefulness from the electronic payment
- The satisfaction of the user has an effect on perceptual usefulness from the electronic payment

Table 3: The results of hypothesis testing

		The path coefficient	t-statistic	result
AU -> PU	Actual use> perceptual usefulness	0.636331	4.780326	confirmed
AU -> US	Actual use> user satisfaction	0.252594	2.618461	confirmed
QI -> AU	Quality of information -> actual use	0.4512	9.258033	confirmed
QI -> PU	Quality of information -> perceptual usefulness	0.444207	10.723441	confirmed
QI -> US	Quality of information -> user satisfaction	0.44237	9.842675	confirmed
QOF -> AU	Quality of services-> actual use	0.37638	5.390978	confirmed
QOF -> PU	Quality of services-> perceptual usefulness	0.393114	9.147129	confirmed
QOF -> US	Quality of services-> user satisfaction	0.416189	9.979771	confirmed
QS -> AU	Quality of system-> actual use	0.271465	6.083735	confirmed
QS -> PU	Quality of system-> perceptual usefulness	0.283078	7.675323	confirmed
QS -> US	Quality of system-> user satisfaction	0.299224	6.832541	confirmed
US -> PU	user satisfaction -> perceptual usefulness	0.478364	2.64713	confirmed

As is clear from Table 3, the path coefficient between qualities of information on actual use is equivalent to 0.4512 and t-statistic equals to 9. 258033. since the value of t-statistic in the structural equation (90258033) from the value of t-statistic with 95 percent confident (1.96). Thus the assumption of existing meaningful relationship between the qualities of information on actual use confirmed with %95. In addition, the value of path coefficient between the two variables is a positive sign. This means that by increasing and improving the quality of information, the actual use increases as well.

Discussion and Conclusion

The obtained results of the research indicate that all the assumptions are confirmed, in following solutions and recommendations will be discussed that will assist to increase the level of desired variables. Each of these suggestions are designed according to research hypotheses.

The result of testing the first hypothesis

"The quality of information has an effect on actual use from the electronic payment"

According to the obtained results, we can see that the value impact of quality information on the actual use is equal to 0.4512.the sign of this impact is positive and means that with improving

quality of information, the actual use of electronic payment system will be improved. Also achieved significance level is less than five hundredths and this effect is significant.

Thus this hypothesis is confirmed.

The result of the fourth hypothesis testing

"The quality of information has an effect on user's satisfaction from the electronic payment"

According to the obtained results, we can see that the value impact of quality information on the user's satisfaction is equal to 0.44237.the sign of this impact is positive and means that with improving quality of information, the satisfaction of users from electronic payment system will be improved. Also achieved significance level is less than five hundredths and this effect is significant.

Previous studies have shown that the more the quality of information provided by the electronic system be appropriate, because that the satisfaction of users be increased and the actual use of system also improved. In other words, IT professionals should try that provided information in payment systems be with the more complete and accuracy in order that be satisfied by the users. Also results of this research is consistent with studies of Legzian et al (2011), Soud Almahamid et al (2011), Lin dersal (2007), Lai et al (2006)

Based on the quality of information on the actual use and user satisfaction of the electronic payment system following suggestions are offered:

1. The non-presence of e-payments caused that the receipts and paper jacks is not taken to bank customers, instead internet receipts e visible printable. For this reason, it is suggested to take very special in how to provide this online receipts as legible and clear of its contents.

2-not-presence of payments cause to some other problems that one of them is the lack of awareness of people of online payment process. Therefore, it is suggested that, the electronic payment process be as manuals so as to be usable by everyone and delivered to customers to prevent the occurrence of problems.

3. In many cases, electronic payment systems, are not used by people because they are not informed of the transfer of funds. Thus, it is recommended the information provided in the online receipts, should be set in a way that, the person in a first glance be aware from his payment.

The obtained results of the second hypothesis,

"The quality of system has an effect on actual use from the electronic payment system"

According to the obtained results, we can see that the value impact of quality of system on the actual use is equal to 0.271465.the sign of this impact is positive and means that with improving quality of system, the actual use of electronic payment system will be improved. Also achieved significance level is less than five hundredths and this effect is significant.

Thus this hypothesis is confirmed.

The obtained results of the fifth hypothesis

"The quality of system has an effect on user satisfaction from the electronic payment system"

According to the obtained results, we can see that the value impact of quality of system on the user satisfaction is equal to 0.299224.the sign of this impact is positive and means that with improving quality of system, the user satisfaction from the electronic payment system will be improved. Also achieved significance level is less than five hundredths and this effect is significant.

Thus this hypothesis is confirmed.

Undoubtedly products and services that, receiving them requires simple usage and have high quality such as ease of use, speed of service, high security, causing that the users made to a particular interest in using them and satisfy a lot of people. In this study also, the quality of system has been influential on satisfaction and actual use of the users. Findings of this research are consistent with studies of Legzian et al (2011), Gilani Nia and Mosavian (2009), Haghighi nasab et al (2009), Soud Almahamid et al (2011), Lindersal (2007).

Based on the impact of quality of information on the actual use and user satisfaction of the electronic payment system following suggestions are offered:

1- One of the biggest problems that people have in technology accepting, is definition of complex process:

In electronic payments, due to high importance of the issue, the raised process seems difficult for some people. Thus it is suggested to reduce the complexity of electronic payments the environments be designed as simple as possible.

2-it is recommended that in the process of building and programming electronic payment gateway, a point should be noted that the big advantage is the high quality of these gateways. Thus design of these pages should be optimized as much as possible in terms of programming.

3-by putting good supports for sites and internet payment gateways it is possible solve the complexity of this field.

The results of the third hypothesis testing

"The quality of services has an effect on actual use from the electronic payment"

According to the obtained results, we can see that the value impact of quality of system on the actual use of system is equal to 0.37638.the sign of this impact is positive and means that with improving quality of system, the actual use from the electronic payment system will be improved. Also achieved significance level is less than five hundredths and this effect is significant.

Thus this hypothesis is confirmed.

The results of the sixth hypothesis testing

"The quality of services has an effect on user's satisfaction from the electronic payment"

According to the obtained results, we can see that the value impact of quality of services on the user's satisfaction of system is equal to 0.416189.the sign of this impact is positive and means that with improving quality of services, the satisfaction of users from the electronic payment system will be improved. Also achieved significance level is less than five hundredths and this effect is significant.

Thus this hypothesis is confirmed.

In different studies either in e-commerce and payment systems and in the other studies about organizational behavior and customer satisfaction, have referred the service qualities especially Serko Val model.in this study also determined that, the quality of services has a significant impact on user satisfaction and actual use of payment electronic system. The two hypothesis are consistent with studies of Legzian et al (2011), Taghavifar and Torabi (2010), Hossein Gazor et al (2011), Soud Almahamid et al (2011), Lindersal (2007).

According to the impact of quality services on actual use of user satisfaction from electronic payment system, the following suggestions is provided:

1-security is the most important concerns in the electronic payments, many cases observed that information of people during electronic payments are stolen. Thus conducting advertisement programs in the public media and introducing services and explaining methods to prevent such concerns is recommended as a proper strategy.

2. One of the problems that the people in the electronic payment systems face with it, is deducting the fund from the first account and not transferring to the destination account. Although after occurrence such defects usually automatically, the deducted fund retrieved to the account of transferee but recommended that these modifications would be done quickly, without delay and at the time of occurring error.

3-it is common to exist some pages in the site entitled with "common questions".it is recommended that the possible problems that a person faced with it during electronic payment would be inserted by a proper classification.

"The actual use has an impact on user's satisfaction of electronic payment system"

According to the obtained results, we can see that the value of actual use on user's satisfaction of system is equal to 0.252594.the sign of this impact is positive and means that with improving of actual use, the satisfaction of users from the electronic payment system will be improved. Also achieved significance level is less than five hundredths and this effect is significant.

The obtained result of eighth hypothesis

"The actual use has an impact on perceptual usefulness of electronic payment system in the

view of users"

According to the obtained results, we can see that the value of actual use on perceptual usefulness of system is equal to 0.252594.the sign of this impact is positive and means that with improving of actual use, the perceptual usefulness of users from the electronic payment system will be improved. Also achieved significance level is less than five hundredths and this effect is significant.

The requirement of user satisfaction and perceiving usefulness of the system, is the right and actual use of the system.in other words if a system correctly be used by the user and the system have the advantages that previously was argued in other assumptions, is effective on satisfaction and usefulness sense. Findings of this hypothesis are consistent with studies of Legzian et al (2011), Mehdi Hosseini and Batol Bozorgmehr (2011), Soud Almahamid et al (2011).

According to the impact of actual use on customer satisfaction on users satisfaction and perceived usefulness of electronic payment system the following suggestions is offered:

1-electronic payment system, gradually must be replaced instead of presence reference to the bank. Thus it is recommended that banks and financial institutions as much as possible removing administrative affairs and do more attempts to achieve this goal.

2-it is recommended that in order to stimulate people to use electronic payment system, would consider some awards and gifts for the users of the system according to the value of conducted transactions.

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Recebido em 1 de fevereiro de 2018.
Aceito em 16 de fevereiro de 2018.