

Evaluating The Features Of Electronic Payment Systems In Iranian Bank Users' View

Fatemeh Hamidi Nava* and Mehrdad Madhoushi**

The goal of this research is evaluating the specifications of electronic payment systems in the view of Iranian bank users. Reviewing the specifications was done in four substructures such as technical, legal, security and socio-economical. Reviewing this subject for designing and establishing proper electronic payment systems is necessary. This research is measurable. A questionnaire about specifications of used types of electronic payment methods was designed in " Likert Spectrum " form ,and between 300 User's of all type of electronic payment method in Tehran's Parsian Banks in period of February 2009 to May 2009 distributed. The statistical data analyzed by SPSS soft ware. And used one way ANOVA for preobsvoration test and Kruskal Wallis test for ranking the specifications in each other substructure and each substructure. According to studies on the main factors of evaluating electronic payment services, it considers that in the view of users, at first the socio economical index, then the security index, legal index and the end the technical index have the most effects on developing the electronic payment.

Field of Research :Features of Electronic Payment Systems , Technical Infrastructures ,Legal Infrastructures, ,Security Infrastructures, Socio-Economical Infrastructures

* Fatemeh Hamidinava,Graduate of Shiraz University,M.A IT Engineering-eCommerce-fhamidinava@yahoo.com

** Dr Mehrdad Mahhoushi, Assistant Professor of Mazandaran University,mmadhoshi@yahoo.com

1.Introduction

Because electronic payment has a special place in Iran's banking system ,considering the evaluation of the features of banks' electronic payment from user's point of views has an important role in removing weaknesses and recognition of the strengths of electronic payments and also some opportunities and threats will be realized for confronting rivals in this field. What is important for payment users is the features of the electronic payment methods and the providers of the electronic system can evaluate these features from user's point of views to provide better services to clients and develop these services. Because Parsian bank is the oldest private banking system in Iran and provides modern methods for electronic banking and tries to expand electronic payment services to other countries, So that it tries to study and evaluate the features of electronic payment methods from users point of views in this research.

2. Literature Review

The features of this research were discussed in four frames of technical, legal, security, and socio-economical infrastructures considering the important role of the payment system infrastructures .As a background for their execution. These features are listed in table in four dimentions and contained their short definitions.

Table 1: The classification of electronic payment system feature based on the infrastructures of electronic payment

Infrastructures	Features	Authors and The year of publication	Definition
Technical Infrastructures	Scalability	Abrazhovich,2004 Madhoushi , 2006 Dejhpasand,2004	The lack of limitation in using system for users and the lack of efficiency reduction during user increment
	Interoperability	Madhoushi , 2006	The lack of limitation in using tools possibilities and equipment of payment for users of other banks
	Flexibility	Madhoushi , 2006	Using modern tools and equipments for providing electronic payment services
	Usability	Mandadi,2006 Doroodchi,Nikmehr,Iranmehr,2007 Fathian,sheikh,2007 Madhoushi , 2006	Exploitability and quick and easy using
	Standardization	Doroodchi,Nikmehr,Iranmehr,2008	Information exchange by users based on standards
	Multi - Currency	Madhoushi , 2006 Abrazhovich,2004	Using multiple currencies for users in payment system
	Convertibility	Madhoushi , 2004 Dejhpasand,2004	The tools and the methods of currency changeability
	Efficiency	Madhoushi , 2006 Abrazhovich,2004	Reducing time consuming calculations and changeability of financial units
	Applicability	Madhoushi , 2006 Madhoushi , 2006 Fathian,sheikh,2007	Can be used in most of the payment situation
Legal Infrastructures	Authorization	Madhoushi , 2006 Abrazhovich,2004	Controlling interaction credit
	Acceptability	Dejhpasand,2004	Payment system and it's mechanism should be for interaction parties
Security Infrastructures	Security	Abrazhovich,2004 Mandadi , 2006	Supporting payment system against internet hackers
	Anonymity, Privacy	Fathian,sheikh,2007 Abrazhovich,2004 Mandoushi , 2006	The lack of possibility of exploring people identity
	Confidentiality	Dejhpasand,2004 Fathian,sheikh,2007 Mandadi , 2006	The lack of unauthorized access to transferred data
	Traceability & Link ability	Madhoushi , 2006 Abrazhovich,2004 Dejhpasand,2004 Fathian,sheikh,2007 Doroodchi,Nikmehr,Iranmehr,2007	It should be not accessible for authorized people to know who, how and how much cost had been used.
	Authentication	Dejhpasand,2004 Fathian,sheikh,2007	The identification of two parties ,identities by each other
	Integrity	Dejhpasand,2004 Fathian,sheikh,2007	Complete data transfer (Money, Data's ,Documents)
	Double Spending	Madhoushi , 2006	The lack of twice expending electronic money
	Non Repudiation	Dejhpasand,2004 Fathian,sheikh,2007	The lack of denying transaction and
Socio-Economical Infrastructures	Re ability	Doroodchi,Nikmehr,Iranmehr,2007 Mandadi , 2006 Abrazhovich,2004	Interactions facilitator factor
	Trust	Mandadi , 2006 Abrazhovich,2004	The degree of costumer trust that his/her money and data will be secure
	Cost	Fathian,sheikh,2007	The low cost of the transaction during payment
	Speed	Internet Banking Research Model,2008	Quick and easy conduction and time saving and effective using of time
	Usefulness	Internet Banking Research Model,2008	Usefulness of electronic payment in daily life

3. Methodology and Research Design

Statistic population consisted of different methods of electronic payment user's in Parsian bank branches in Tehran from February 2009 to May 2009. The type of this research measurable.

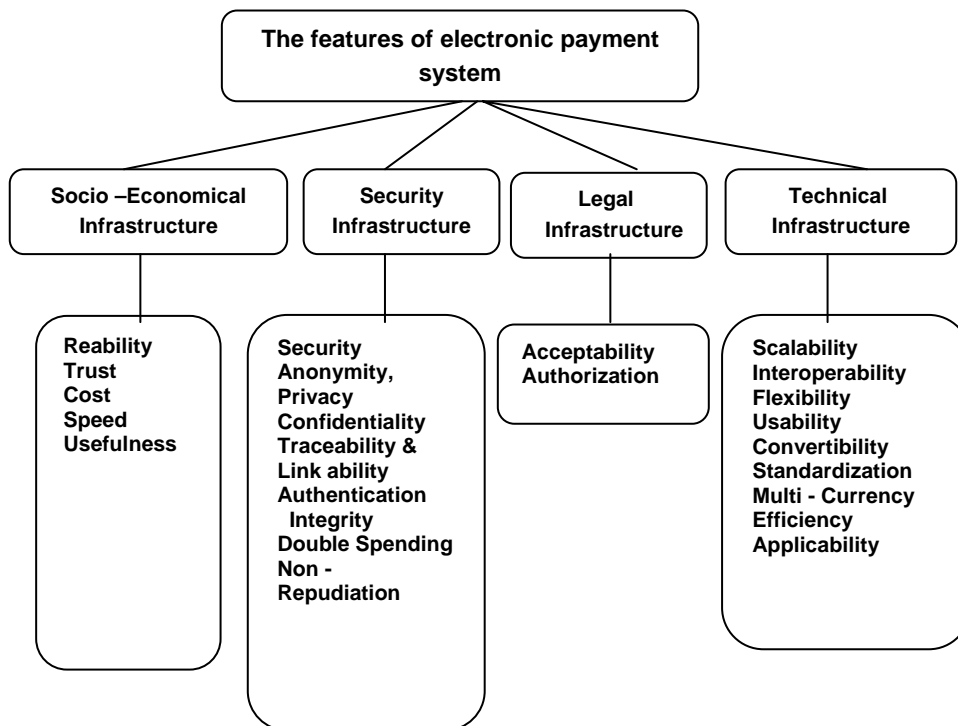
Statistic population with calculation of figures this research and considering,

$$n = \frac{N z^2 p q}{e^2 (N-1) + z^2 p q}$$

formula. Statistical confidence level was 5%, z equal to 1.96. the rate of sampling error was 5%, and the highest rate of variance was 0.25 for p=0.50, the rate of unsuccessful was equal to 0.50, and the error was equal to 0.057%.

The sample volume was 300 persons. Research tool was Likert Questionnaire and multiple choice question for accurate evaluation of special features of electronic payment methods, How people will be familiar with these features and bank services, the evaluation, the recognition and the rate of using, them by bank customers. Questionnaire stability, cronbach α was 91.2% and the rate of correlation between two parts was 81.6% that shows the high independence of questions. Unilateral variance analysis was used for features rating in abovementioned dimensions and each dimension. Considering abovementioned subjects in these research four classifications were used for the features of system features that are shown in following figure.

Figure 1: Electronic payment system Features classification based on its infrastructure



4. Discussion of Findings

Based on descriptive statistics of the main indices of questionnaire, some statistical parameters of users are as following:

Sex:77.6%Male,22.4%Female.

Degree: Under Diploma 2.0%,Diploma 24.1%,Associate of art 16.7% ,Bachelor

44.6%,Master 9.5% ,PHD 3.1%.

Age: 21-30 ;0.3% ,31-40 ;50.7% ,41-50 ;17.0% ,Upper than 50;32.0%.

Statistical parameters were studied from Parsian bank users point of views as following, the year of familiarity with electronic services was recorded from 2001 to 2009 in questionnaires that the highest rate belonged to the years between 2003 to 2006. the way of familiarity with electronic payment services for this five multiple choice question includes friends , relatives , bank propagandas , bank clerk myself and others that the highest rate belonged to friends and relatives and then myself . The rate of familiarity with electronic payment services was questioned based on different kinds of services that based on results, 15% of respond ants measured their familiarity high and 14% rated average. 32% rated their familiarity very high. The rate of using electronic payment services was declared 17%. Average use, 13% was high rate and 18% was the highest rate.

4.1. Inferential Statistics of Sub Indices

Unilateral variance analysis was used for the study of the probable differences between the main indices of the research and between the sub indices considering, data normality in inferential statistics section. Kruskal wallis test was used on recognized priorities of questionnaire respondents.

The rate of satisfaction with electronic payment services was 18% for average 21% for high and 19% for very high .

$$H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \mu_6$$

$$H_1: \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5 \neq \mu_6$$

The result of variance analysis for the study of meaningful differences, the average rate of calculation amount for satisfaction for any electronic payment services was between 96. 0 to 3.45 it means the lowest rate of satisfaction to high. Fisher statistic rate was 2.66 e – 23 that was near to zero. the rate of f statistics was 88.71 from f equal to 2.22, therefore supposition rate of all kinds of electronic payment method was rejected and it was accepted, based on these results, the measurement for classification and rating all kinds of electronic payment were done based on Kruskal wallis test based on these results, the rate of satisfaction priorities was respectively ATM, POS, payment cards, internet bank, parsian telephone and bank mobile services.

In the comparison of the method of electronic payment of Parsian bank with other banks 40% selected. Better services, 33% equal rate and 24% selected (I don't know) item. Also 1.2% declared that the services of electronic payment of the Parsian bank became worse than other banks. Zero to three coefficients was related to the answers of the question for conducting test. Student T test was used for the comparison on Parsian bank with other bank. That it's average equals to 2.12 near to the answer better. Fisher statistics of this amount is zero that states test acceptability. Consequently, the methods of electronic payment in Parsian bank are better than other bank from user's point of views.

4.2. The Inferential Statistics of the Main Indices

Considering the population sample distribution normality, because of high amount of sample, parametric test was used. In analysis tests, unilateral tests are used for the study of the average difference between the main indices .So that zero hypothesis and front hypothesis are provided as following.

$$\left\{ \begin{array}{l} H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4 \\ H_1: \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \end{array} \right.$$

Considering table 4 it should be considered that the average rate of answer is between 3.4 to 3.82. This shows the high importance of the classified features from respondent point of views. As mentioned, the meaningful level amount of fisher statistics is less than 0.05 (equals to 3.99451E-13), And because f statistic is larger than f with the amount of 2.61 shows that it is in the limit of crisis. So in the meaningful level of 95% we can reject this null hypothesis, these groups can be prioritized and have different amounts based on priority degree.

Based on studies on the main indices there are meaningful differences between these factors, from parsian bank customers, point of views. In Kruskal wallis test, based on table six it was considered that the X2 statistic amount are 83 and 108 that are larger than the amount of X2 distribution with 3 freedom rate and a = 0.05 that is equal to 781473 and fisher statistics is zero that is smaller than 0.05 so that we can easy certainly that there is meaningful difference in the features of electronic bank services. That it's rating as following. Based on information the main socio-economical index is obtained by the amount of 658.14 in the first rate. In the second place there are legal features and security features are in the third position and fourth position is placed with a meaningful interval with other features of the main feature of technical features.

4.2.1. Rating Technical Group Features

The study of following sub indices the subsets of the main group of technical features has nine statements, so the subjects of the hypothesis test are as following.

$$\left\{ \begin{array}{l} H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \dots = \mu_9 \\ H_1: \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5 = \dots \neq \mu_9 \end{array} \right.$$

The average answers of these items based on the table 7, are between 3.19 to 3.66 that of all factors in the evaluation of the features of Parsian bank electronic payment services. F statistics equal to 7.86 is larger than 1.94 and located in critical position Fisher statistic is near to zero and is less than 0.05. So that considering the result, supposing zero based on similarities between the averages of sub factors is not corrected and H1 is accepted. Based on obtained results, some measurement are done for classification and prioritizing above mentioned indices.

We can see that X2 statistic is 51465 that is larger than the X2 statistic amount with 8 degree freedom and α equal 0.05 that is equal to 15.5073 and the amount of bilateral Fisher statistic is zero that is smaller than 0.05 so that we can easily that there is meaningful difference between sub indices of technical group from Parsian bank customers' point of view and we can rate the Features of technical group. The priorities of these features are in the users' point of views.

4.2.2. Rating Legal Features

Based on result the average rates of the amount of two studied parameters are between 3.51 to 3.62 that show the effect of parameters in satisfaction with the methods of Parsian bank electronic payment.

$$\begin{cases} H_0: \mu_1 = \mu_2 \\ H_1: \mu_1 \neq \mu_2 \end{cases}$$

In unilateral variance analysis, null hypothesis is that the two sub parametric Legal infrastructure has not meaningful difference with each other and hypothesis one is against null hypothesis. Fisher statistic amount is equal to 0.19 that is larger than 0.05 and F statistics that is equal to 1.69 less than f limit equal to 3.86 so there are enough reasons for rejecting the null hypothesis of the existence of meaningful difference between two parameters of subset of legal infrastructure so that there is no need to rating legal group features. And both features are there in a same rate. Based on test results, it can be seen that the amount of X2 statistics is 6.124 that is larger than X2 distribution statistics and $\alpha = 0.05$ that is equal to 3.84146, and the amount of fisher bilateral statistics is 0.013 that is less than 0.05 so that we can say that there is meaningful difference between sub indices of legal groups from bank costumers point of views and it help rating legal group features.

4.2.3. Rating the Features of Security Group

The study and the determination of electronic payment system in the frame of the main security group that are the main 7 questions of the questionair , null hypothesis is as following :

$$\begin{cases} H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \mu_6 = \mu_7 \\ H_1: \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5 \neq \mu_6 \neq \mu_7 \end{cases}$$

The average attitudes of bank customers for the rate of the importance of security sub indices is between 3.57 and 3.9 that is high. The average rates of answers are near each other and are in the region of 3.55 to 3.91. Based on fisher statistic meaningful level is less than 0.05 and the obtained f amount F amount is 13.73 that is larger than F amount of critical region equal to 2.1 so that there is no possibility to reject null hypothesis and it can be observed that from respondents point of views, the priority group is not identical it. Means that these factors didn't have identical importance from costumer point of views, so that they can be prioritized. Based the result of the tests, it can be observed that the amount of X2 statistic is 105.35 That is larger X2 distribution statistics with 6 degrees of freedom, although fisher bilateral statistics is less than 0.05, so that it can state that there is meaningful difference between subs indices of security group from Parsian bank point of views and we can rate security group features.

4.2.4. Rating Socio Economical Features

Sub indices of the main group of socio economical features of the electronic payment system that have five sections. The average result s is between 3.64 and 4.13 that show their importance from bank customers' point of views, so that null hypothesis is shown as following.

$$\left\{ \begin{array}{l} H_0: \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 \\ H_1: \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5 \end{array} \right.$$

The results of the studies are shown in table 16 that state abovementioned factors have important priority from respondents' point of views and are more than 3.5 based on obtained data. Based on data, the meaningful level of Fisher statistic is less than 0.05 (equal to 0.000) and obtained amount of F is equal to 8.88 that is larger than the amount of F related to critical region is 2.33, so that it is less than 0.05, so we can reject null hypothesis, so that we know from respondents point of views, sub factors have not identical importance and prioritization is possible between these factors. Based on the results of the test , we can observe that the amount of X2 statistics is 80.071 that is larger than the amount of X2 statistic distribution with the freedom degrees of 4 and a=905 this is equal to 948773 and the amount of fisher bilateral statistics is zero that is less than 0.05 so we can say currently that there is meaningful difference between sub indices of socio economical group from Parsian bank customers point of views , and we can rate the features of socio economical group. The obtained results of the rating socio economical featured ,in each factors , considered measures were conducted for determining effective features in using parsian bank electronic payment system.

5. Conclusion

Because in each one of these factors, necessary measures were taken for determining effective features. The rate of importance of these classifications from users' point of use socio-economical. Of using parsian bank electronic payment system, all groups are explained as following:

The evaluation of the features based on technical infrastructure : rating the features of technical group , usability , flexibility , standardization , development ability (scalability) efficiency , changeability , applicability , interaction ability , some currencies. The evaluation of features based on legal infrastructures these features are in a similar rate :

The effective features from parsian bank users , point of views based on priorities are as following :

Usefulness , confidentiality , cost , security , acceptability , unity , traceability , trust , usability , confirmation , flexibility , development ability (scalability) standardization .

Based on results obtained from this research following suggestions are recommended for developing , and designing the methods of electronic payment methods in Parsian bank.

Suggestion after studying the result of the features of the electronic payment systems from technical, legal, security, socio-economical infrastructure point of views are following:

- ✓ The features of **Development ability**, providing suitable table communication background for mobile communications.
- ✓ The feature of **Standardization**, observing global standard for developing electronic payment to large countries.
Adapting considered technologies in technical infrastructure background with standards, monetary and banking regulations.
Suitable distribution (geographical) of ATMs and POS in different position in the city.
- ✓ The feature of changeability, and receiving monetary units other countries' currencies.
- ✓ The features of confirming, regulation and approving the legal regulations of crimes and frauds of electronic payments for developing security of these payments.
The collection of clear executive in striations and regulations
 - ✓ The feature of **Acceptability**, providing suitable law backgrounds and standard procedures of developing mobile banking and tele communication

networks for determining and preserving private domain and supporting people's personal data and preventing, probable misusing.

Security feature, enough and quick attention to security structures in the country internet networks, their developments and promoting

The security level of networks

The features of identity identification institutionalising digital signs.

✓ The feature of **Confidentiality** and **Unanonymous**, standard procedures for developing, tele communication and mobile banking, networks for determining and preserving private domain and supporting personal data and preventing probable misusing (adaptation of these technological with standards and monetary and banking regulations)

The features of **Undesirability** and **Traceability**, clearing the method of interaction between banks and operators in executive and security domains.

Trust feature, insurance coverage for electronic exchanges

Cost feature, attempts to reducing the cost of connecting to internet and mobile phone.

The feature of Usefulness training expert forces in banks for removing problems.

References

Abrazhevich, D. ,2001,. **Issue of: User Acceptance Electronic Payment Systems.** SamenwerkingsOrgaan Brabantse Universiteiten (SOBU) .

Abrazhevich, D. ,2004, April,. **User Acceptance Electronic Payment System:a User Centered Prespective and Interaction Design.** University Eindhoven,PHD Thesis .

Agora .1996, .A Minimal Distributed Protocol for Electronic Commere

Dejhpasand, F October, 2004, Money **Electronic Transferring in Iran Electronic Banking**, Trade ministry studies and research institute.

Doroodchi, M.Nikmehr, N.Iranmehr, A. 2007 **The Evaluation of Payment Systems in e-commerce**, the first global electronic banking conference

Javadi .Beyhaghi.S.S(2004)**Electronic banking**

Parsian Electronic Trade Company-2009

Sheikh, A.Fathian, D., spring, 2006, **The Evaluation of Payment System of Iran Electronic Rating**, Modern trade and economy, no.4, Pages 1-15

Madhoushi,M.Zali,M.Amani,M,Autumn,2005,**The Evaluation Features of Different Kinds of Electronic Payment System from Iranian User's Point of Views** .Social and Humanities Quarterly ,Mazandaran University(Scientific research ,Fifth year,Number19