

Evaluation the Effect of Objective Dimensions of Electronic Payment on the use of Electronic Payment Systems with the Mediating Role of Mental Dimensions in Electronic Payment in Mellat bank branches in Gorgan Province

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Abstract : The current study was formed aiming at investigating the effects of electronic payment objective aspects on the use of electronic payment systems with a mediating role of electronic payments subjective aspects in Gorgan Mellat Bank branches. This is an applied research in terms of objective and descriptive-survey and cause-and-effect methodologically. The statistical population of the current research are the customers of Gorgan Mellat Bank branches whose numbers are unlimited. The questionnaires were distributed by ratio stratified random sampling among 384 customers. Data were analyzed by structural equations and LISREL software. Results indicated that electronic payment objective aspects affect the use of electronic payment systems with a mediating role of electronic payments subjective aspects in Gorgan Mellat Bank branches. In this regard, all the research hypotheses were confirmed and at the end some recommendations were presented to Gorgan Mellat Bank branches.

Keywords: technical protection-transaction processes-security statements-perceived security-perceived trust-use of banking electronic payments system

1.Introduction

One of the necessary tools for the realization and development of electronic commerce is the existence of electronic banking which can facilitate the practice and activities related to e-commerce consistent with global, financial and monetary systems. The use of electronic systems in the world's financial and credit institutions is expanding rapidly and the number of e-banking services users are increasing day by day. Due to the extensive and deep impact of electronic commerce in the dominance of global markets, as well as the importance of monetary and credit exchanges in each commercial-economic activity, it's also necessary for the tools and context of money transfer and exchange to be appropriately and properly developed consistent and along with e-commerce development. In the meantime, banks have also been busy with attracting more customers and expanding and diversifying their services and coordinated themselves with information and communication technologies rapidly. In the field of commercial developments, banks have focused their

attention on the establishment of structural changes in receive and pay systems and facilities

in the process of customer service. In fact, we can claim that one of the reasons of public interest in e-commerce has been the attention of bank managers to the importance and necessity of this phenomenon which as a result led to their serious consideration and orientation toward providing an electronic banking structure. (Behmand, 2007)

Computers and internet have their own specific security issues and the possibility of security risks is greater for the computers associated with networks such as internet. The expansion of crimes committed by computers has been so great that most of the world's countries are fighting this phenomenon with law enforcement and trying to inhibit it. (Shahlayi, 2009)

Today, business partners (customers, merchants and financial organizations) do not have any interactions through direct physical experience anymore. Instead, they adjust their

experience through mediated multi-dimensional interactive environments. As a result, the most basic issue for the trend of information exchange in open and heterogeneous environments (like the internet) is the establishment of trust (Tsiakis et al, 2005). Electronic commerce has been made on the basis of electronic payment system. As e-commerce becomes an important element of business operations for many companies, electronic payment systems have also become a hot issue for business and successful financial services (Cotteleer, 2007).

Electronic payment system is one of the fundamental parts of e-commerce which is responsible for providing credit and funds movement. Also, the new types of these systems have the capability of cash movement, marketing and sales. Electronic payment systems are the fruits of modern technologies and communication development and advance human knowledge to the extent that accesses are easier than before. What this system seeks is decreasing the size and scope of supply chains. Supply chain is a path that links consumer to producer or producer to other producers and the product must travel it to reach the hands of final consumer (Fardi & Vatanian, 2012). In traditional business, the buyer and seller had the ability to communicate with each other physically, but in e-commerce both sides should talk to each other with a similar digital language. A very important point that must be considered in this regard is the security of communication in e-commerce, because unlike traditional business, the buyer and seller do not see each other during commercial transaction and a method should be established to identify the information sources and guarantee information accuracy during information movement and protection. One of the ways to build customer confidence in a website is to promise to pay back customers' money in cases of their dissatisfaction and this indicates that the seller ensures his products.

The lack of alignment with electronic banking and not using electronic payment system will be followed by a lot of time costs for customers and the possibility of using banking services for them is only in office hours based on branches. Due to the existence of traditional

payment structure, banks also require a lot of manpower and providing services to customers and their markets will be limited locally. In such a condition, banks should offer new financial services for customer orientation and paying attention to their needs and demands and a reliable electronic payment system without security flaws can be used as an effective competitive tool against other rival banking and financial institutions (Karimi et al, 2012). Regarding the mentioned issues in this research, we want to investigate electronic trust indexes in electronic payments according to a model used by Heydarzadeh & Alinejad (2012) and Kim (2009) for examining the relationship between trust and use of electronic payment system. According to previous conducted research, electronic trust indexes are considered technical infrastructures, transaction processes, security statements and experience from reliable sources and at the beginning efforts are made to investigate their effect on perceived security and trust and then on the use of electronic payment systems in Golestan province Mellat Bank branches.

2.Theoretical foundations

2.1.Payment systems

Payment systems are the vital part of economic and financial infrastructures of a country. Their good performance in a safe and timely transfer of funds is their most important effect on the overall performance of economy system. But payment systems can be a serious risk for customers, since these systems can transfer problems from one part of economy to other parts as a channel. This systematic risk is the main reason of central banks' attention and interest in designing and operating these systems (Bank of England, 2005). As in the articles by Medvinsky & Newman (1996), features of electronic payment systems have been used to describe and evaluate electronic payment systems. Features discussed in this review have been considered as a framework for the evaluation of electronic payment systems. Some of these features are effective in providing a proper image of electronic payment systems criteria and help them to improve. The information obtained from this aspect, are actually used as inputs of electronic payment

systems design. Several factors can be contributed to the success or failure of payment systems, but not all of them are due to technical nature of payment systems. As mentioned before, the acceptability of user's desired system depends on many issues, we can refer to the ways of customer selection, preferences, advertisements, market condition etc. as examples. Many issues can be found in researches and studies related payment systems. For example Medvinsky, Newman and Wayner (1997), Lynch & Lundquist (1996) and Langdon et al (2000) have referred to security, reliability, convertibility, efficiency, tracking etc. in their books.

All individuals mostly considered technical issues of electronic payment systems. In this study the cases which are important for users and relevant to them have been considered. Features that are mentioned in this study are used for the evaluation of payment systems (Abrazhevich, 2001).

Anonymity: This feature indicates the user's demands for maintaining his personal and private information and identity (Madhooshi, 2004). In some transactions, the identity of the parties is not revealed which is called anonymity. Anonymity refers to this fact that there is no possibility to discover and disclose the identity of any person. Anonymity becomes important when the cost of transaction is not to the extent to be worthwhile to ask individuals all their personal information and specifications.

Applicability: Added value of payment mechanisms depends on the usefulness of these systems in purchasing. Applicability (or acceptability) which has been used in many references has a specific definition in payment system as long as it is suitable for payment operation during online sales.

Authorization: In literature, authorization method refers to the way of controlling transaction credit. Authorization method is done either online or offline. Offline authorization means that when users are not connected to network can exchange the desired money without the presence of the third party (mediator of trading).

Convertibility: Users normally use mechanisms that can satisfy their needs at the time of payment.

Efficiency: A system with necessary efficiency should be capable of processing little and small payments without incurring cost and shortcomings on its performance.

Interoperability: A system is an interactive system if the payment system is not only dependent on one company and also allows other beneficiary parts to be connected. This goal can be achieved by the use of open and comprehensive standards for data transfer protocols and infrastructures.

Multi-Currency: Across different countries, there will be efficient and effective payments when its related systems have the ability to process multiple-currency.

Scalability: Due to increased commercial use of the internet, demand for using payment infrastructures is also on the rise. Payment infrastructures should have the feature of scalability and accept new users and shops in themselves (Medvinsky and Neuman, 1993).

Security: One of the main factors which have been studied frequently in payment systems is security (Caum, 1997).

The security of electronic transactions depends on the following factors (Kim et al, 2009)

System factors: technical infrastructures

Transaction factors: secure payments based on defined rules

Legal factors: legal framework

Traceability: Traceability clarifies how to track money circulation and sources of paid funds in a process of electronic payment and online shopping.

Trust: Paying attention to cases mentioned in previous sections and their implementation in a proper form will lead to building a favorable trust and confidence (Wayner, 2003).

Usability: Online payment is not a complex and vague issue and is usually done in an easy and applicable manner (Guttmann, 2003). The requirements that were discussed on electronic system payment are about its use (Lynch & Lundquist, 1996).

Reliability: Normally, users and business environment accept systems which are of a high

reliability and dependability, since performing services and procedure of commercial units depends on an easy access and successful operations of payment infrastructures (Medvinsky & Newman, 1993).

2.2.Perceived trust

Normally, users and business environment accept systems which are of a high reliability and dependability, since performing services and procedure of commercial units depends on an easy access and successful operations of payment infrastructures (Medvinsky & Newman, 1993). Trust is one of the concepts that have been studied by experts in different sciences and various definitions of it have been presented according to the dominant paradigm of each of these sciences (Mulring, 2004)

Trust is the focal concept of sociology's classical theories and also the core of social capital modern theories and background of social interactions and relations (Armaki & Kamali, 2004)

While addressing the definition of trust by Luhmann, Giddens has also noted that "wherever trust is raised, the individual has consciously various alternatives in mind for deciding on the adoption of a particular course of action" and conceptualizes trust and its associated concepts on several elements. In an overall classification, we can investigate the concept of trust in electronic teams working in electronic organizations on the following three levels: (Ishaya et al, 2000)

- Trust at technology level
- Trust at media level
- Trust at community level

The generalization of these three levels of trust is possible in relation to individual trust among citizens or the trust among several electronic cities.

3.Objective aspects of payment

Technical protections: Technical protections are generally introduced as the foundations of security payment system and defined as a set of specific technical mechanisms used to ensure the security of payment in the process of online transactions (Slyke and Belanger, 2003; Linck et al, 2006)

Transaction processes: It is the primary objective of transaction methods in order to facilitate the use of electronic payment system by consumers and to eliminate concerns about security (Lawrence, 2000)

Security statements: Security statements in electronic payment system websites are very important factors affecting consumers' trust in online activities (Mukherjee and Nath, 2003)

4.Research literature

Heydarzadeh & Alinejad (2012) conducted a research entitled "Investigating customers' perceptions of security and trust in electronic payment systems among Iranian online customers". This study was carried out using the comments of 210 Iranian online customers and structural equation model. Their research findings showed that technical protections and trading (transaction) processes have a positive relationship with perceived security and trust to electronic payments. Moreover, experience from reliable information sources was related positively to perceived electronic trust. Also, their research findings showed that perceived security has a positive and significant relationship with perceived electronic trust and there is a positive relationship between perceived security and trust and the use of electronic payment.

Karimi et al (2012) in a research investigated the impact of customers' perception of security and trust on the use of electronic payment systems in Tehran Agricultural Bank branches. The results of main hypotheses testing of the conceptual model in the form of structural model showed that transaction processes and technical protection variables have positive and significant effect on perceived security, transaction processes and security statement variables on perceived trust, perceived trust variable on the extent of use and perceived security variable on perceived trust.

Mehranfar (2011) conducted a research entitled "customers' perception of security and trust in electronic payment systems of Tehran Saderat bank". In this research, customers' perception of security and trust in the use of Saderat Bank's electronic payment systems was evaluated. The independent variables of research model included transaction processes, technical

protections and security statements and dependent variables included perceived security, perceived trust and the use of banking electronic payment system. Research findings indicate the high level of perceived security and trust in Saderat Bank's electronic payment systems. The results also show that transaction processes and technical protections have an impact on the increase of perceived security and security statements and transaction processes have an impact on the increase of perceived trust. Perceived security has a positive impact on perceived trust and the increase of perceived trust will also increase the use of Saderat Bank's electronic payment system.

Khodadad Hosseini et al (2009) conducted a research entitled "The investigation of factors affecting customer trust in e-commerce (B2C)." The statistical populations of their research were the customers who had been shopping from the existing electronic stores of Iranian Virtual Society electronically and a random sampling was performed among them. The results obtained from analyses showed that the assumptions related to infrastructural and company variables were confirmed, but the assumptions concerning personal factors had no effect on customer trust.

Rooyba (2011) conducted a research entitled "Factors affecting intentions to use electronic payment in Kuwait". The results of their research showed that the role of perceived trust

and joy adjusts the role of external factors (individual innovations, knowledge, willingness to trust and the presence of a third person) in the intention to use electronic payment system. These factors can strengthen the acceptance of website use in Arabic countries.

Kim et al (2009) have conducted an experimental study of customers' perception of trust and security in electronic payment systems. In this research, the security issues of electronic payment systems were evaluated from customers' perspective and a model was presented to determine customers' perception of trust and security and its effect on the use of electronic payment system. Results show that both technical protection and security statements are important factors for improving customers' perception of security; perceived security has a positive relationship with perceived trust and the use of electronic payment system and also customers' perception of trust has a positive impact on use of electronic payment system.

Mukherjee and Nath (2007) conducted a research entitled "The role of electronic trust in e-commerce". The results of their research showed that the privacy and security of website features and shared values are the key factors of trust which are related positively to commitment. Behavioral intentions of customers are the results of trust and commitment in organizations. Also, the cost of change has a negative impact on customers' commitment.

According to what has been said in theoretical foundations and research literature, the

conceptual model of the study is presented as follows:

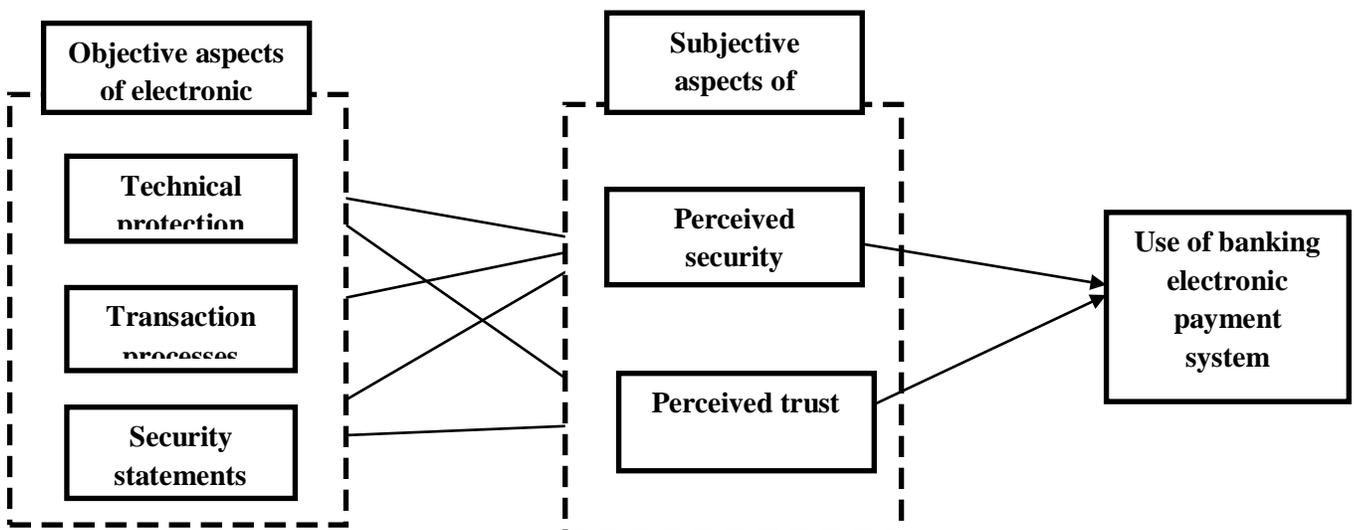


Figure 1: The research conceptual model has been taken from the models of Heydarzadeh & Alinejad (2012) and Kim (2009).

5. Research methodology

The current study is an applied research in terms of objective, descriptive (non-experimental) in terms of data collection method and is considered one of the branches of field studies and in terms of the relationship between research variables, it implies a kind of causal relationship and has been conducted by survey method.

The relationships between variables in research hypotheses of the conceptual model were proposed as follows:

1. Technical protections affect the perceived security of banking electronic payment system users.
2. Technical protections affect the perceived trust of banking electronic payment system users.
3. Transaction processes affect the perceived security of banking electronic payment system users.
4. Transaction processes affect the perceived trust of banking electronic payment system users.
5. Security statements affect the perceived security of banking electronic payment system users.

6. Security statements affect the perceived trust of banking electronic payment system users.

7. Perceived security affects the use of banking electronic payment system by users.

8. Perceived security affects the perceived trust of banking electronic payment system users.

9. Perceived trust affects the use of banking electronic payment system by users.

The present research statistical population is the customers of the Gorgan city Mellat Bank departments that their number is taken unlimited. The samples' number is 384 according to Morgan table. The standard questionnaire distributed comparatively among the customers in classified form and the results analyzed through factor analysis and structural equations. The questionnaire is used for information gathering that its reliability has been confirmed by the expert professors. The questions have been propounded in closed form and Likert scale form. The table 1 shows the research variables, each variables related questions, reliability coefficient, and the design references.

Table 1: Cronbach's alpha

| Variables | Number | Number of questions | Alpha coefficient |
|--------------------------------------|--------|---------------------|-------------------|
| Transaction processes | 390 | 6 | 0.92 |
| Technical preservations | 390 | 6 | 0.80 |
| Security statements | 390 | 5 | 0.80 |
| Perceived security | 390 | 5 | 0.79 |
| Perceived trust | 390 | 4 | 0.81 |
| Using bank electronic payment system | 390 | 3 | 0.85 |

For model estimation and investigation of model fit the Chi-square index on degrees of freedom $\frac{\chi^2}{df}$, comparative fit index (CFI),

goodness of fit index (GFI), adjusted goodness of fit index (AGFI), normed fit index (NFI), non-normed fit index (NNFI), and the root-

mean-square error approximation (RMSEA) was used.

Table 2: the results achieved from the investigation of research structural sample goodness of fit index

| Fitting index | Acceptable amplitude | amount | result |
|--|----------------------|--------|-------------|
| $\frac{\chi^2}{df}$ (Chi-square index on degrees of freedom) | <3 | 2.44 | appropriate |
| CFI (comparative fit index) | >0.9 | 0.96 | appropriate |
| GFI (goodness of fitting index) | >0.9 | 0.96 | appropriate |
| AGFI (adjusted of goodness of fitting index) | >0.9 | 0.95 | appropriate |
| NFI (normed fit index) | >0.9 | 0.98 | appropriate |
| NNFI (non- normed fit index) | >0.9 | 0.96 | appropriate |
| RMSEA (root-mean-square error approximation) | <0.08 | 0.063 | appropriate |

The investigation results of goodness of fitting index of the research structural model that has come in table 10-4 shows the model fit while the amount of less than 0.08 in RMSEA indicates the acceptable fit of the structural model. Also the amounts of CFI, GFI, AGFI, NFI, and NNFI are more than 0.9.

The path coefficients and significance have been mentioned in the table below. As it can be observed, the path coefficients have been achieved significant for all the nine relations at the level of 0.05 (larger than 1.96 and smaller than -1.96 t).

| Path | symbols | Path coefficient | significance | Test results |
|--|------------|------------------|--------------|--------------|
| Technical preservation-perceived security through the bank electronic payment system users | PS---TP | 0.22 | 4.18 | accepted |
| Technical preservation-perceived trust through the bank electronic payment system users | PT --- TP | 0.31 | 6.44 | accepted |
| Transaction processes-perceived security through the bank electronic payment system users | PS --- TRP | 0.42 | 7.37 | accepted |
| Transaction processes-perceived trust through the bank electronic payment system users | PT --- TRP | 0.11 | 2.12 | accepted |
| Security statements-perceived security through the bank electronic payment system users | PS---SS | 0.24 | 4.48 | accepted |
| Security statements-perceived trust through the | PT --- SS | 0.16 | 3.38 | accepted |

| | | | | |
|--|-------------|------|------|----------|
| bank electronic payment system users | | | | |
| perceived security- usage of the users from bank electronic payment system | EPSU --- PS | 0.35 | 5.07 | accepted |
| perceived security- the perceived trust through the bank electronic payment system users | PT---PS | 0.43 | 6.88 | accepted |
| perceived trust- usage of the users from bank electronic payment system | EPSU --- PT | 0.46 | 6.57 | accepted |

Figure 2: the research structural model in the significant form

In table 12-4, there are direct and indirect relations between the research variables in the final model of the survey that is an indicator of the amount of variables' direct and indirect relations on each other.

6. Discussion and conclusion

The results of the research hypothesis indicated that the objective dimensions of the electronic payment affect the usage of electronic payment with the moderator role of subjective dimensions of Mellat Bank department electronic payment and in this direction, the 1-7 hypothesis of this research have been approved. The results of the hypothesis 1, 3, and 5 showed that the objective dimensions of the electronic payment impresses theperceived security through the bank electronic payment system users. In this direction it is proposed that the system must guarantee high degree of security and operational consistency and also contain pertinent mechanisms for daily process complementation. It must have the ability to perform simultaneous final settlement in the exact day of exchange. It always should preferably ask for username and password, while the entrance of the customer to the system during the day or at least at the end of the electronic payment day. The electronic payment system provided the chance of change in the payment information, before the payment process of final stage complementation, for the customers. The user must be provided the required instruments in order to achieve information from the transaction stages step by step and the required instructions ought to be represented to him. The present hypotheses are in concordant with the researches performed by Heydarzade and Ali Nejad (2012), Karimi et al (2012), Mehranfar (2011), and Kim (2009).

Total variables amount of relation in the main model of the research

The results achieved from the hypotheses 2, 4, and 6 showed that the objective dimensions of the electronic payment impresses theperceived trust through the bank electronic payment system users. In this direction it is proposed that the system must contain a set of specified objectives and criterions and public accessible which let everyone have free and fair

participation in payment system. The appearance of the website must have simple, clarified, and beautiful structure and its visiting be easy. Also be loaded fast and no need for any tools download exists. The preparation of the service contact information for the customers is obligatory. The sites' visitors and those who intend to use electronic services in the occasion that need for help or represent their ideas are seeking the contact information. The websites owners have to consider the way of information gathering and use regarding their privacy policy. The present hypotheses are in concordant with the researches performed by Heydarzade and Ali Nejad (2012), Karimi et al (2012), Mehranfar (2011), and Kim (2009).

The results achieved from the hypotheses 7 and 9 showed that the perceived security and trust affects the usage of the users from bank electronic payment system. In this direction, it is proposed that the system must be based on the firm legal principles under related juridical procedures. The rules and procedures must be in

a way that all the other members of the system be able to have accurate and clarified perception of the participation financial risks. The customers' education and culturing must be formed for encouraging the use of the POS (point of sale) instead of cash payment from ATM and finally the optimum development of interbank relation network on different bans' POS is suggested. The present hypotheses are in concordant with the researches performed by

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