

E-PAYMENT TECHNOLOGY ADOPTION: EMPIRICAL EVIDENCE FROM EMERGING ECONOMY

Maha Mourad, Ph.D. Department of Management
American University in Cairo
Cairo, Egypt

Hussam Farouk Sherif, MBA, IT Projects
Orascom Telecom Group
Cairo, Egypt

Biographical Details

Dr. Maha Mourad is an Associate Professor of Marketing, School of Business at the American University in Cairo. She was awarded her Ph.D. from the University of Nottingham Business School, UK in 2004; her MBA as well as her B.A is from The American University in Cairo. She spent Fall 2006 in George Washington University as part of her Fulbright research grant. Her research interest is in the area of brand equity, brand management, diffusion of innovation, service marketing and higher education marketing. She has published a number of journal articles as well as participating in several International Conferences. In addition, she has been involved in different marketing consultants' assignments in Egypt and the Middle East.

Hussam Sherif is a holder of B.Sc in Electrical Engineering from Cairo University, 1994, Egypt and MBA from Maastricht School of Management, Netherlands, 2011. He started his career journey in IT as an Internet System Developer in one of the major ISPs in Egypt in mid nineties. In December 1998 he joined Vodafone Egypt team as a Business Analyst in the IT Department. He gained lots of knowledge in the telecom business and widened his experiences in both IT and the mobile services industry. In 2005, the researcher moved to International Turnkey Systems, Kuwait as a Project Manager then to LHS Systems, Dubai in 2006. After the successful project closure in Dubai, he returned back to Vodafone Egypt as an Interim Invoicing Systems Manager where he stayed for two years. In November 2008, he joined Orascom Telecom Holding in Cairo as an Operations Support Manager then promoted in 2010 to hold the IT Program Management Office responsibility.

Abstract :

It is worth to investigate to what extent the e-payment technology is considered an effective innovation to improve service quality and enhance the organization innovativeness. Hence, the objective of this research is gaining a deep understanding for the factors that affect e-payment acceptance and adoption from customer point of view. Practically, the results would indicate the factors that affect customer's adoption to e-payment based services and relation to the service performance in Egypt as an example of an emerging economy. Concerning the methodology, first, an exploratory research has been conducted in the form of qualitative research to investigate the opinion of four decision makers in telecom and banking industries to validate the research problem and framework. Then, a survey was launched with questions about different potential factors such as ease of use, usefulness, the need for personal interaction, risk/ privacy, and compatibility. Four of the constructs used were originally from the Self-Service Technology (SST) model, while compatibility was adopted from Mallat (2005) model and added to the proposed model of this research because of its relevance to the Egyptian market. The Personal Innovativeness in IT had been introduced as a moderating variable into the model and the five independent variables were examined under PIIT effect as well. The 378 responses were quantitatively analyzed using the SPSS tool. The outcome of this research showed that the attitude towards e-payment technology has positive relationship with the perceived ease of use, the perceived usefulness and compatibility and a negative relationship with the risk. The need for interaction did not show a significant effect on the attitude of adoption of the service. Introducing the Personal Innovativeness in IT neutralized the effect of the compatibility factor. This implies that the leader users' groups are the most likely to adopt such a payment option.

Keywords: E-Payment Adoption, Online Payment, Innovation, Diffusion, Perceived Ease of Use, Perceived Usefulness, Perceived Risk, Egypt, Emerging market, Communication Industry.

INTRODUCTION

Traditionally, service encounters has been categorized as face-to-face rather than high tech environment due to the distinctive characteristics of services, namely intangibility, inseparability, heterogeneity, and perishability (Bateson, 1991; Zeithaml, 1991). It is widely recognized that, as a

consequence of these characteristics, consumers perceive higher degrees of risk when selecting a service (Laroche, Bergeron, and Goutaland, 2003; Mitchell & Grotorex, 1993; Mitchell, 1999; Bateson, 1991; Murray, 1991). Hence, there are a number of external and internal strategies adopting by the service provider to reduce the perceived risk. The external strategies are namely brand management and Integrated marketing activities (Bateson, 1991; Temple, 2006; Chen, 2008). On the other hands, the internal strategy is focusing on enhancing the performance of the service through adoption of new technology innovation that facilitate the service delivery and enhance the service support function. Hence innovation is considered one of the main drives on enhancing the service performance (Jiménez- Jiménez and Sanz-Valle, 2011). In addition, information and Communication Technology (ICT) has become a crucial factor modernizing the service processing and performance. Recently, information technologies, backed up by the Web 2.0 technologies, have been applied in various fields giving benefits to almost every aspect of life, including business transactions (Patrick and Dotsika, 2007). "It is claimed that to be competitive in today's "high tech" world, firms will need to offer specialized services and develop an innovative customer-focused strategy employing the new technologies" (Drennan & Coll-Kennedy, 2003, P296). Electronic payment concept is seen as the corner stone for all webs based sales and paid services online transactions (Liu, Tarn & Wen, 2004). However, it is worth to investigate to what extent the e-payment technology is considered an effective innovation to improve service quality and enhance the organization innovativeness. Hence, the objective of this research is gaining a deep understanding for the factors that affect e-payment acceptance and adoption from customer point of view. Practically, the results would indicate the factors that affect customer's adoption to e-payment based services and relation to the service performance in Egypt as an example of an emerging economy.

E-PAYMENT- A NEW SERVICE ENCOUNTER

E-Payment is a critical facility that helps organizations not only to sell online but also collect receivables such as telephone bill payment. Therefore, it is important for the economy in general to start promoting it and increase its public acceptance among society (Heikkinen, Paivi. Livarinen, and Timo, 2011; Raja, Velmurgan, and Senthil, 2008). Generally, when dealing with new

innovation especially in the service market it is critically important to explore the factors that lead to its acceptance and diffusion (Lu, Yao & Yu, 2005; Jiménez- Jiménez and Sanz-Valle, 2011).

The electronic payment is a vital factor in the ecommerce cycle (Whiteley, 1999) that involves three players; the customer, the merchant, and the financial services providers (banks). Customers are the users of the services who perform the e-payment to receive a product or a service. When they use electronic payment, customers are always worried about financial risks such as the probability of losing their money during the transaction, and threats to personal information leakage (Featherman, Valacich, & Wells, 2006.). The second players are the organizations provided the service that are using the e-payment service as an internal strategy to enhance the overall quality and performance of the organization. Finally, banks are key players in this process as they provide the credit card validation online for such services. All three players are working together to enhance the shopping experience. Taking into consideration that the main player is the service provider who is seeking customer loyalty through delivering value while offering high quality services (Parasuraman & Grewal, 2000).

It should be noted that E-payment is not only seen as a tool to facilitate selling-related operations, but also any type of payment services such as paying the fixed phone bills charges, credit card, bank transfer, and online payment system (Steiner, 2002; Sahut, 2008). According to a survey in the beginning of last decade, major portion of buyers and sellers depend on electronic payment services to do business on the web. Approximately before 1998, there were few electronic payment services in place, starting 2000 there are few options to pick from for small business. As a solution for small businesses, there were a couple of types of payment, and accounts were holistically financed through bank accounts and credit card accounts. First type is person-to-person transaction where people can transfer money electronically to each other; "PayPal" is the most famous one in that payment service type. The other type of payment services allows buyers to make money orders online through mail to recipients; they pay fees for using the service. In addition, some well established organizations that had merchandizing accounts were able to verify credit cards electronically and could do online transactions through such accounts. Cards are charged via secure gateways and use fraud prevention techniques

(Address Validation & CVV). Gateways are proven to be secure with address validation and CVV (Steiner, 2002; Sahut, 2008).

THEORIES OF TECHNOLOGY ACCEPTANCE

There are a number of theories that empirically tested the technology acceptance in different contexts. One of the main theories is the Theory of Planned Behavior (TPB) that was developed by Ajzen (1991) and derived from the Theory of Reasoned Action (TRA) by Fishbein (1975). Both TRA and TPB measure the intention as an intermediate dependent variable; both were employed to assess the intention for new technology or invention use. Another important theory is the Technology Acceptance Model (TAM) that was built by Davis (1989) to assess the acceptance of a new technology/invention. TAM is a famous model and is adopted from the theory of reasoned action. 'Perceived Usefulness' and 'Perceived Ease of Use' are the two main variables in the TAM model. Perceived usefulness measures how much would a technology enhance the performance of its user. Perceived ease of use represents how easy the use of that technology is. The TAM was further developed to the TAM 2 by adding one more variable; the 'Subjective Norms'. The TAM model can be a good fit for this research; however, TAM variables are not enough to cover all predicted factors that may affect the e-payment adoption (Davis, 1989).

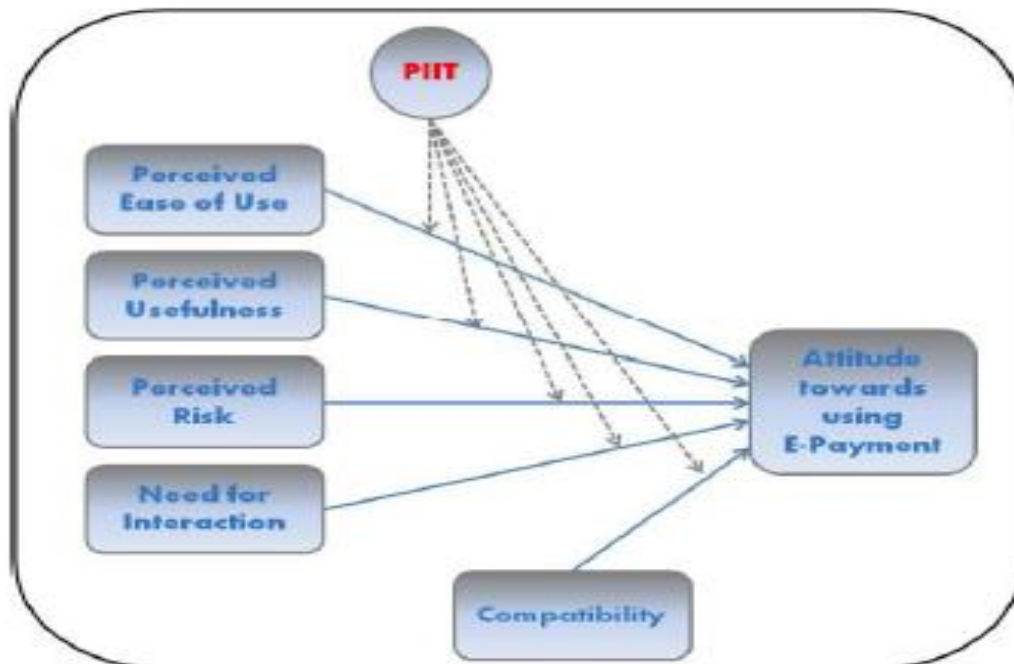
The Self Service Technology Adoption (SST) model was developed by Curran and Meuter, (2005) for the self-service technologies. E-Payment is a self-service technology that is used by people to perform payment transactions electronically on the Internet or through any other e-medium. The Self Service Technology Adoption model has four variables to measure positive attitude towards a new technology. Those four variables are Ease of Use which is the degree to which a user would find the use of a particular technology to be requiring little or no effort to be exerted from his/her side (Davis, 1989); Perceived Usefulness, that reflects how users regard the technology as of benefit and value to them; Need for interaction which is a desire to keep personal contact with people while getting a service (Dabholkar, 1992); and finally Risk which is the customer belief that a negative consequence may happen as a result of using a specific service. This model is the most suitable one for this research as it tackles the self-service technologies to which e-payment belongs. The variables of the SST model match what other e-payment studies had used in different empirical studies in addition to the risk and need for personal

interaction (Dabholkar, 1992). In addition, Mallat (2008) has developed the Use Intention model to assess the mobile ticketing adoption in Finland in 2008 and also in another research in Iran in 2010 (Babae, 2010). Mallat (2008) model covers many variables however; the researchers will only use the Compatibility out of those variables. Compatibility measures how far that technology is compatible with people life style and match customers' existing values, past experience, and needs of potential adopters (Gupta & Rogers, 1991; Straub, 2009; Mallat, et al., 2008; Babae, 2009). The rest of variables measured by Mallat (2008) are either irrelevant or already covered by other theories already mentioned before. **THEORETICAL FRAMEWORK**

The proposed theoretical framework consists mainly of the SST model (Curran & Meuter, 2005) in addition to the "Compatibility" variable brought from Mallat (2008) model due to its relevancy to the Egyptian culture as it measures how far that technology match customers' existing values, past experience, and future needs (Gupta & Rogers, 1991; Straub, 2009; Mallat, et al., 2008; Babae, 2009). Obviously, this model can be used in any self-service technology. As explained earlier, the "Self-Service Technology Adoption" model has four variables for measuring positive attitude towards a self-service new technology. Those four variables are: ease of use, usefulness, need for interaction, and risk. Ease of use can be defined as how the user would find utilizing the technology product easy to use and require exerting little effort. Usefulness is by definition considered as the degree to which the user will find the technology of benefit to him/her (Davis,

1989). The need for interaction is a desire to keep personal contact with people while getting a service (Dabholkar, 1992). The perceived risk is the customer belief that a negative consequence may happen as a result of using a specific service. The customers will always try to avoid any negative consequences due to his payment transactions. This means that the dependent variable of the research will be the positive attitude towards the service. Egyptian customers may have special impressions about the internet and little interaction with it generally in the context of his/her life style; therefore, the Compatibility on using e-payment has been extracted from the research model of Mallat (2008) and added to the proposed model of this research. In several other studies conducted world-wide, the moderator was the Personal Innovativeness in IT (PIIT). The researchers will also use the Personal Innovativeness in IT (PIIT) as a moderator that could have impact on the other variables; namely the Ease of Use, the Usefulness and the Risk. Agarwal & Prasad (1998) results had partially supported the hypothesized moderating effect of PIIT to the relationship between ease of use and adoption and also the relationship between usefulness and adoption. On the risk side, it was also determined that the PIIT has a moderating effect (Agarwal & Prasad, 1998). Based on the outcome of the exploratory study that was done as part of this research, the PIIT moderating effect will be studied on all the five variables of the proposed model. Figure (1) represents the proposed conceptual framework.

FIGURE 1: THE PROPOSED CONCEPTUAL FRAMEWORK



The two models used to construct this proposed model are widely used and empirically adopted in some past researches and studies. The SST model variables have been used in empirical studies in several industries mainly in the technology; however there is one empirical study in the restaurants industry. On the other hand, Mallat (2008) model variables have been used widely in empirical studies in several industries (Babae, 2010).

RESEARCH HYPOTHESES

Based on the proposed conceptual framework (Figure 1), the researchers developed several hypotheses in order to empirically test the model in the Egyptian market. As it was mentioned in table (2) all the proposed independent variables are supported by previous empirical studies. The first independent variable is the perceived ease of use, which measures the extent to which a customer may find it effortless or needs a little amount of effort to use the technology (Agarwal & Parasad, 1999; Mallat, et al., 2008; Huong, 2009; Babae, 2009; Kincaid & Baloglu, 2007). The researchers investigate the influence of perceived “Ease of Use” on the customer positive attitude towards E-payment.

H1: Perceived Ease of Use of E-Payment is positively related to the positive attitude towards E-Payment based services.

Another independent variable is the usefulness of a service that is measured by the probability of improving the task that is being performed by the user of the service in case of that particular service/ technology has been used (Agarwal & Parasad, 1999; Mallat, et al., 2008; Huong, 2009; Babae, 2009). Hence the researchers measure the extent that the perceived “Usefulness” of the E-Payment technologies affects the customer positive attitude towards E-Payment.

H2: Perceived Usefulness of E-Payment is positively related to the positive attitude towards E-Payment based services.

The need for interaction is another independent variable that refers to the customer need for being interactive and receiving personal interaction during the service encounter (Curran & Meuter, 2005; Hamadi, 2011; Dabholkar, 1996). The researchers investigate the influence of “Need for Interaction” by customer on his positive attitude towards E-Payment.

H3: Need for Interaction of E-Payment is negatively related to the positive attitude towards E-Payment based services.

The “Perceived Risk” is another independent variable that measures the degree to which the customer may perceive the security of using this particular technology (Mallat, et al., 2008; Vietnam, Huong, 2009; Babae, 2009; Baloglu, 2007; Pikkarainen, 2004). The researchers investigate the influence of

perceived “Risk” of E-Payment technologies on the customer positive attitude towards E-Payment.

H4: Perceived Risk of E-Payment is negatively related to the positive attitude towards E-Payment based services.

“Compatibility” measures how far that technology is compatible with people life style and the way they perform their payment transactions (Mallat, et al., 2008; Babae, 2009). Also “Compatibility” refers to compliance with customers’ existing values, past experience, and needs of potential adopters (Gupta & Rogers, 1991; Straub, 2009). The researchers measure the influence of the “Compatibility” of customer on his positive attitude towards E-Payment.

H5: Compatibility of E-Payment is positively related to the positive attitude towards E-Payment based services.

The customers who have “Personal Innovativeness in IT” (PIIT) may perceive the E-Payment to be easy and useful for them as it provides a quick and easy way to do the job of paying for a product or service conveniently. Because they have IT skills, they estimate the associated risk accurately and objectively (Huong, 2009). The moderating effect of the PIIT on both need for “Personal Interaction” and “Compatibility” will also be studied based on the outcome of the exploratory research.

H6-a: Personal innovativeness in IT has a moderation effect between perceived usefulness and e-payment use.

H6-b: Personal innovativeness in IT has a moderation effect between perceived ease of use and e-payment use.

H6-c: Personal innovativeness in IT has a moderation effect between need for personal interaction and e-payment use.

H6-d: Personal innovativeness in IT has a moderation effect between perceived risk of use and e-payment use.

H6-e: Personal innovativeness in IT has a moderation effect between compatibility and e-payment use.

RESEARCH CONTEXT: THE EGYPTIAN EMERGING MARKET

The commercial introduction of the ADSL service in Egypt took place in 2000. In the beginning it has been launched in big cities like Cairo and Alexandria but later on it entered other regions. There are more than 200 Internet Service Providers (ISPs) in the country providing ADSL services. However, the Class A companies is only four and they own the gate of the internet then they resell it to the lower-class companies (8 major companies) who in turn resell them again to the rest of the ISPs. Obviously, the service for the home-users segment is still at a very poor level mainly due to infrastructure-related issues. In 2008 the Internet service in Egypt and Middle East encountered a problem due to a breakage of two marine cables FLAG FEA and SMW4 that connect Egypt to the rest of the world. At the end of the year, three of the cables were damaged and users complained from the low speed.

Regarding the Internet access, internetworldstat.com revealed a massive growth in the number of Egypt internet users during the period from 2000 to 2011; the number of internet users in Egypt in year 2011 is approximately forty times the number of internet users in Egypt in year 2000. In 2000, there were only 450,000 citizens use the internet and that was 0.7 %. In 2006, the volume was 5,100,000 users (7.0 %). Finally, in 2011 the number of users was 20,136,000 users (almost 25 % of population).

Following the Internet development, electronic commerce and trading in Egypt started to be in a good shape. The e-commerce in Egypt showed both the Business to Business and the Individual deals and transactions. The internet penetration in business communities is larger than the one in Business to Consumer side. The electronic commerce is booming in a portion of the population where people own credit cards and have access to the internet. On the other hand, large corporations had already started to use intranet sites to manage their inventories. Individual electronic commerce customer segments are targeted by some sites in Egypt including stock trading, real estate, fast food, Egyptian handicraft work and HR businesses. Electronic payment in some of them is not necessary such as food delivery sites that allow the customer to pay upon delivery when he receives the order. As globaltechforum.eiu.com states, “one of the problem with e-commerce growth in Egypt is trust”. Although Egyptian buyers use their credit cards online when they buy from abroad, they are still reluctant when they are requested to use it in local web entities.

On the credit facility side, Egyptians do not use credit cards widely although banks offer payment cards that

are issued to be used only over the internet. The Central Bank of Egypt gave permission to eleven non-governmental banks, including foreign ones, to start their e-banking services. Citibank Egypt and HSBC Egypt were listed in those banks that offer e-banking in Egypt. However the volume of the electronic transactions use is relatively low. The findings conducted by Synovate (market research firm) showed that the number of credit card holders in the upper and middle-upper classes increased from 66% in the year 2009 up to 72% in the year 2010. "The use of credit cards among youth has also seen an increase from 18 percent in 2009 to 33 percent in 2010 as well as usage among females more than doubling, from 10 percent in 2009 to 22 percent in 2010" (Daod, 2011).

Government also started to deal with citizens online through various websites that allow online transactions. The governmental online services include driving license renewal, national ID reissuance, birth certificate issuance and other services (www.egypt.gov.eg). Taxation on ecommerce deals in Egypt is being collected at as low as 1% duty on revenues from ICT businesses entities to help in the development of the industry. There is no legal limitation on the residence location of the merchants; however, non-Egyptian sites may need a permission to sell to Egyptians (Ecommerce Journal, 2007).

In light of the development in the E-payment systems, a rapid growth in e-commerce has been noticed. Almost all e-payment systems that are used worldwide are available in Egypt and can be employed (Ecommerce Journal, 2007). The key players like government and banks support the development of the e-world transactions in the country, therefore the advancement will continue to grow. The new related services like the Electronic Bill Presentment and Payment (EBPP) is a factor that helps the growth as well. The primary objective of the service provider is to provide electronic payment services to the Egyptian government and other entities in order to consolidate the payments and receipts of Egyptian government (Ecommerce Journal, 2007). "The e-Pay system is part of the process of establishing a National Payments Gateway in Egypt to enable the variety of business and government institutions and ministries to advance the existent system of e-services and e-payments; moreover it intends to add new payment channels and methods" (Ecommerce Journal, 2007, P3).

Egypt is African nature and Arabian culture along with its ancient Egyptian heritage is positioned as a

unique country that differs from the western countries. Even though, the country made a large development in the economy that classifies Egypt as a country with a strong potential in e-World including the e-payment service diffusion (Ecommerce Journal, 2007). Based on the above facts, the need is existent and the road seems to be paved for the service to be implemented and widely used. Moreover, many companies, merchants and organizations have already offered the e-payment based transactions over the web and even mobile. Even though, many people are still hesitant to start using the online payment service to pay their bills, etc. The outcome of an exploratory research that was done as part of this research showed that Egyptians are hesitant in using their credit cards online and the percentage of people who use this type of services is low.

For e-payment to be considered by more commercial entities, the acceptance and the degree of adoption for such payment method or service among people need to be validated and/or measured. Therefore, this study of the adoption of e-payment services in Egypt is relevant now more than ever, because of the high growth of all the above-mentioned e-commerce and e-business opportunities.

RESEARCH METHODOLOGY

In this research, the Self-Service Technology Adoption model is being used; therefore, the research in terms of reasoning is classified as deductive research. Also, this research depends on an articulated questionnaire and will reach its conclusion by analyzing the data that will be gathered through a survey; therefore it is a Quantitative research (Creswell, 1994). The research is also applied research because it uses the existing theories, information and methods to find a solution for the research problem. Additionally the large volume of the gathered data will be used through statistical methods to form useful pieces of information making the research descriptive. The conclusion is that the research is exploratory descriptive and its outcome is applied. To conclude the research is of a quantitative type and it is logically deductive.

DATA COLLECTION INSTRUMENT AND SOURCE

The researchers have full access to the primary data, which were collected, through the survey from the target population. This target population is the Internet subscribers who own one payment card at least. The questionnaire is designed to be in a form of

Likert-style scale questions; which is commonly used as a research method for opinions surveying (Ryan, et al., 1998). The scale consists of five options for every answer (1 = strongly disagree through 5 = strongly agree). The survey is being managed in two ways; electronically through email and internet in addition to paper sheets/forms to be filled by hand and entered into the system manually. Respondents groups are friends, family members, coworkers and others who satisfy the population conditions in Egypt. People in such groups also extended the survey link to their networks by mail and through other social mean/media websites. The researchers used the social media websites like Facebook to reach the proposed sample size.

SAMPLING METHODS

The researchers used Krejcie & Morgan (1970) model as a sampling method. A population of one million and more is defined by the modes and a sample of 384 is considered satisfactory. Confidence level equals 95% a plus or minus 5% interval. The main criteria is the people who have access to the internet and use it while they are at the same time owning one payment card at least. Any respondent who does not satisfy those conditions was eliminated from the survey. Sampling doesn't involve random selection, therefore it was considered as a non-probabilistic sampling (Cochran 1977). By contrast, the ill-defined non-probabilistic sampling involves selection from a restricted, accessible part of the population, or the preferential selection of what are considered to be 'typical' units" (Kenkel, Juhasz – Nagy & Podani, 1989). Hence, the population is the internet users in Egypt who own one payment card at least. The sampling method is non-probabilistic and the sampling criterion is convenient with a target sample of 384 respondents.

In the beginning, a pilot study was initiated for the purpose of questionnaire assessment and to see what adjustments can be made to it accordingly. An initial version of the questionnaire was formed. Several respondents rejected to set interview meetings and preferred to receive the questionnaire through email to participate. To assure quality feedback results, respondents were sent the questionnaire by email and appointments were made for conference calls with them to assist them in responding to what the researchers need. The email did not only include the questionnaire but the whole theoretical framework as well. The package had been sent out to four persons whom are considered within the targeted customer segment. in the same time for review. The four persons are Branch Manager, HSBC Egypt;

Customer Care & Billing Systems Senior Manager, Vodafone Egypt; Business Support Systems Senior Manager, Orascom Telecom; and Operations Support & Infrastructure Systems Senior Manager, Orascom Telecom. They all agreed that the questionnaire is satisfying the needs and is comprehensive enough with minor recommendations for changing the wordings.

DATA ANALYSIS RELIABILITY TEST

The below table (3) shows the Cronbach's Alpha coefficient between variables used in this research.

Table 3: Reliability test (Cronbach's Alpha) result by variable

<i>Variable</i>	<i>Cronbach's Alpha</i>	<i>N of Items</i>	<i>Classification</i>
Attitude towards E-Payment	.909	3	Excellent
Ease of Use	.861	4	High
Usefulness	.898	4	High
Need for Interactions	.651	3	Moderate
Risk	.876	6	High
Compatibility	.852	3	High
Personal innovativeness in IT	.902	4	Excellent
All questions	.924	27	Excellent

As can be seen in the above table, the need for personal interaction is acceptable as is it almost 0.7. The questions in the survey in this section had measured personal preferences that are not necessarily related to the e-payment and that could be a reason for a minor deviation in its results.

SPEARMAN'S RANK ASSOCIATION TEST

The researchers started the inferential analysis part by performing Spearman test to identify the correlation between the independent variables and the dependent variable. That is to say that the research hypotheses were first tested through Spearman's rho correlation to indicate whether a significant relationship between the independent variables and the dependent exists as assumed by the model adopted for this research.

Table (4) indicates that all variables with an exception of X3 (Need for interactions) showed a significant positive effect on positive attitude towards

E-Payment, as assumed by the proposed conceptual framework, except for the need for interactions, in the following order from strongest to weakest: X1 Ease of Use; X2 Usefulness; X5 Compatibility and X4 Risk.

Table 4: Spearman's rho correlation test results

<i>Dependent variable</i>	<i>Y Attitude towards E-Payment</i>	
<i>Independent variable</i>	<i>Correlation Coefficient</i>	<i>Sig. (1-tailed)</i>
X1 Ease of Use	.691(**)	.000
X2 Usefulness	.674(**)	.000
X3 Need for Interactions	.034	.255
X4 Risk	.468(**)	.000
X5 Compatibility	.604(**)	.000

** Correlation is significant at the 0.01 level (1-tailed).

Furthermore, a spearman correlation was run on the question level of those measuring X3: Need for interaction to explore reasons for which this independent variable showed no significant relationship with the dependent variable; a relationship previously proven. Table (5) below indicated no significant relationship with the first question, a positive significant relationship with the second, however weak, that mismatch the expected direction for the relationship of this variable. A negative significant relationship with the third question is showed, matching the anticipated relationship direction for this dimension. This means that the effect of the last two questions is neutralized by each others to give conclude to the insignificance of the "Need for Interaction" as a factor that affect the positive attitude towards using e-payment. The second question focus on the personal side of the need for interaction while the third asks about a performance related expectation. This is a candidate reason for this conflict in the results. This specific point can be a candidate for further research by splitting the Need for Interaction into two parts; personal related needs and performance related needs/expectations.

Table 5: Spearman's results for questions of "need for interaction" with Attitude

Dependent variable	<i>Y Attitude towards E-Payment</i>	
	<i>Correlation Coefficient</i>	<i>Sig. (1-tailed)</i>
<i>Questions measuring X3</i>		
Q12 I enjoy seeing the people who work at my service provider	-.008	.439
Q13 Personal attention by the people at my service provider is important to me	.177(**)	.000
Q14 The people at my service provider do things for me that no machine could	-.143(**)	.003

** Correlation is significant at the 0.01 level (1-tailed)

LINEAR REGRESSION

The next step for Hypothesis testing was to perform the Linear Regression Test with and without the moderating effect of the PIIT. That is to say that an initial model that includes all independent variables was first run to fit the dependence of positive attitude towards E-Payment on all predictors. Followed by a second model to which the moderating variable was added to capture the moderating effect of Personal innovativeness in IT on the relationship between independent variables and the dependent.

Initial Regression Model (including all independent variables)

The ANOVA test of this model indicated its acceptability from a statistical perspective, since the significance value of the F statistic is less than 0.05, which means that the variation explained by the model is not due to chance, as shown in table (6).

Table 6: ANOVA test results of the initial model

<i>Model</i>		<i>Sum of Squares</i>	<i>Df</i>	<i>Mean Square</i>	<i>F</i>	<i>Sig.</i>
1	Regression	144.897	5	28.979	104.23	.000
	Residual	103.435	37	.278		
	Total	248.333	37			

R Square, the coefficient of determination, is the squared value of the multiple correlation coefficients. It shows that 58% of the variation in the dependent is explained by the model. While the adjusted R Square is the estimated R-square for the population, it accounts for approximately 58% as well, Table (7).

Table 7: Regression Model Summary of the initial model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.764	.583	.578	.5273063	2.237

The above table displays the Std. Error of the Estimate as well which with the linear regression model should be considerably low. As for The Durbin-Watson statistic that tests the null hypothesis that the residuals from an ordinary least-squares regression are not auto-correlated. The Durbin-Watson statistic ranges in value from 0 to 4. A value near 2 indicates non-autocorrelation, and in our case the Durbin-Watson of the model is slightly above 2.

The tolerance is the percentage of the variance in a given predictor that cannot be explained by the other predictors. When the tolerances are close to 0, there is high multicollinearity and the standard error of the regression coefficients will be inflated. A variance inflation factor (VIF) equals or greater than 5 is usually considered problematic. Table (8) indicates lack of multicollinearity between independent variables, hence the assumption is satisfied.

Table 8: Collinearity Statistics of the initial model

Model	Collinearity Statistics	
	Tolerance	VIF
X1 Ease of Use	.421	2.373
X2 Usefulness	.514	1.947
X3 Need for Interactions	.990	1.010
X4 Risk	.727	1.376
X5 Compatibility	.446	2.241

From all the above, the researchers can then conclude that all regression assumptions are tested and found met, hence all regression findings should be held statistically accountable.

The below table (9) indicated that, matching the correlations results, all independent variables showed a positive effect on positive attitude towards E-Payment, except for the need for interactions, but in a different order than that illustrated by the correlation, as follows: X1 Ease of Use; X2 Usefulness; X4 Risk; X5 Compatibility. Hence, the researchers could then reject Ho1, Ho2, Ho4 and Ho5 and Fail to reject Ho3.

Table 9: Coefficients of the initial regression model

	Unstandardized Coefficients		Standardized Coefficient	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.427	.149		-2.862	.004
X1 Ease of Use	.413	.062	.343	6.654	.000
X2 Usefulness	.370	.065	.264	5.646	.000
X3 Need for Interactions	.030	.037	.027	.794	.427
X4 Risk	.211	.039	.210	5.357	.000
X5 Compatibility	.126	.054	.118	2.347	.019

Second Regression Model (including moderating variable)

R Square, the coefficient of determination, shows that 59% of the variation in the dependent is explained by the model. While the adjusted R Square is approximately 58%, Table (10). The Std. Error of the Estimate is considerably low and Durbin-Watson of the model is slightly above 2. In addition, the ANOVA test of this model indicated its acceptability from a statistical perspective as shown in table (11).

Finally the Collinearity statistics shown in table (12) indicates lack of multicollinearity between independent variables, hence the assumption is satisfied.

Table 10: Regression Model Summary of the second model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin - Watson
1	.765	.585	.578	.5270155	2.226

Table 11: ANOVA test results of the second model

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	145.289	6	24.215	87.184	.000
	Residual	103.044	37	.278		
	Total	248.333	37			

Table 12: Collinearity Statistics of the second model

Model	Collinearity Statistics	
	Tolerance	VIF
X1 Ease of Use	.409	2.443
X2 Usefulness	.512	1.953
X3 Need for Interactions	.990	1.010
X4 Risk	.723	1.383
X5 Compatibility	.407	2.456
M1 Personal innovativeness in IT	.626	1.597

The inclusion of Personal innovativeness in IT to the model led to a 1% increase in the R-square, while the pattern of significance of Ease of Use, Usefulness and Risk did not change much, compatibility became significant at a 10% only instead of 5 % with a lower

coefficient, i.e. the inclusion of the moderating weakened the effect of compatibility. Hence, the researchers could then Reject Ho6 as presented in table (13).

Table 13: Coefficients of the second regression model

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.459	.152		-3.029	.003
X1 Ease of Use	.401	.063	.332	6.359	.000
X2 Usefulness	.365	.066	.260	5.572	.000
X3 Need for Interactions	.029	.037	.026	.784	.433
X4 Risk	.208	.040	.207	5.267	.000
X5 Compatibility	.106	.056	.099	1.893	.059
M1 Personal innovativeness in IT	.047	.040	.050	1.188	.236

Personal Innovativeness in IT, as a moderating variable, neutralized the effect of the Compatibility on positive attitude towards E-payment when added to the relationship. Table (14) below shows that the cross relation between Personal innovativeness in IT and Compatibility reveals that most respondents who has PIIT has high compatibility in the same time and vice versa. This relation explains the results of the change in compatibility results when the PIIT introduced as a moderator.

Table 14: Cross tabulation between Personal innovativeness in IT and Compatibility

	<i>MI Personal innovativeness in IT</i>						<i>Total</i>	
	<i>SA</i>	<i>A</i>	<i>N</i>	<i>D</i>	<i>SD</i>	<i>SA</i>		
X5 Co mp atib ility	SA	Co un t %	31	51	18	0	0	100
		wi thi n X5 %	31.0%	51.0%	18.0%	.0%	.0%	100.0%
	A	Co un t %	20	89	69	18	0	196
		wi thi n X5 %	10.2%	45.4%	35.2%	9.2%	.0%	100.0%
N	Co un t %	0	13	34	20	2	69	
	wi thi n X5 %	.0%	18.8%	49.3%	29.0%	2.9%	100.0%	
D	Co un t %	0	0	2	5	3	10	
	wi thi n X5 %	.0%	.0%	20.0%	50.0%	30.0%	100.0%	
			.0	1.6	10.	60.	2.6	

	<i>MI Personal innovativeness in IT</i>						<i>Total</i>
	<i>SA</i>	<i>A</i>	<i>N</i>	<i>D</i>	<i>SD</i>	<i>SA</i>	
SD	wi thi n M1	%	%	%	9%	0%	%
	Co un t %	0	0	0	3	0	3
Total	Count	51	153	123	46	5	378
	% within X5	13.5%	40.5%	32.5%	12.2%	1.3%	100.0%
	% within M1	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

FINDINGS AND DISCUSSION

Based on the data analysis results mentioned above, the researchers had reached to the following findings:

- Ease of Use, Usefulness, Privacy/Security Concerns and Compatibility are all factors that affect the positive attitude towards using the E-payment technology.
- The “Need for Personal Interaction” was one of the independent variables in this research that was assumed to have an impact on the positive attitude towards using e-payment technology. Even though, the results did not support this hypothesis and the three questions of this variables showed three contradicting results.
- The introduction of the PIIT as a moderator did not change the pattern of the Ease of Use, Usefulness and Risk / Privacy. The

“Need for Interaction” conclusion did not change as well and it was not significant in the relation.

- The introduction of the PIIT as a moderator weakened the effect of the compatibility and people who have high PIIT have high compatibility in the same time.

The need for interaction questions were contradicting and might not be interpreted in a right way by respondents. It is obvious that one question asked about personal nature of the need for personal attention while the other one asked about the need for a person because people are more reliable than machines and they can do things more efficient than machines. This was a performance related question that has been answered in a way that went in the opposite direction of the personal question. These two questions specifically were the reason behind the neutralization of the variable. This particular area is a candidate for more investigation and research.

The PIIT has a moderating effect on the relations in the model. Compatibility effect has been weakened due to the introduction of the PIIT as a moderator and this can be explained by the fact people who have PIIT usually technology geek and their life style and habits can be compatible with using technology. More than 80% of those who strongly agreed to the compatibility section were either agreeing or strongly agreeing with the PIIT section.

The positive attitude towards e-payment is positively affected by the perception of the ease of use of the technology, which supports the first hypothesis of this research. The same conclusion can be applied on the perceived usefulness. The risk has a negative correlation with the positive attitude towards e-payment as suggested in the fourth hypothesis. This particular variable has been tackled as privacy in the opposite direction in both the survey and data analysis tests. This explains the positive correlation shown in the test results in the last tests. The fifth hypothesis is also supported as the compatibility has a positive relation with the dependent variable. Finally PIIT has a moderating effect and it had changed the results of the compatibility and neutralized its effect on the attitude.

The final outcome of the data analysis is that the positive attitude towards e-payment technology has positive relationship with the perceived ease of use, the perceived usefulness and compatibility and a negative relationship with the risk while the need for

interaction did not have effect on the positive attitude. Future work might be recommended for this point as will be advised in the next section. PIIT introducing as a moderator has neutralized the effect of the compatibility. This means that the leading users are the most compatible group with the e-payment usage and they can be encouraged to promote the technology within their circles of influence as will be discussed later.

RECOMMENDATIONS

Based on the outcome of the data analysis and the results concluded in this research. It is recommended to initiate a roadmap for promoting the e-payment technology adoption in Egypt. This plan must be developed by the contribution of all concerned parties such as business entities, banks, communications organizations and the government.

Following are the most critical recommendations that can be derived from the results of this research:

- Major and respectable organizations including governmental ones must promote the e-payment in collecting their receivables and the government must encourage that by incentives to those business entities and organizations.
- Banks must encourage the use of the e-payment services by encouraging their customers to use the technology associated with the payment cards issued from the banks through awareness campaigns, incentives and other motivating actions.
- The usefulness of the technology is recognized by a very large portion of the sample respondents; therefore, emphasizing this factor in the marketing campaigns will be very useful in increasing the technology adoption.
- Service providers must to educate customers about security aspects of the technology and the e-payment process that they follow. There were a tendency to disagree with the questions in this part of the survey; therefore, it is highly recommended to put the security matters in the focus of the awareness campaigns and add the security tips to the ads of the service providers and the some other governmental organizations and the banks.

- Willingness to learn showed a high percentage of agreement as well; therefore, it must be taken into consideration that customers need to learn how to use the e-payment technologies through their service providers.
- The negative response in the personal need for interaction section can be utilized as well by promoting the freedom of using the e-payment 24 hours a day 7 days a week with much less hassles of moving to the service provider shop or office.
- Banks and service providers must invite their customers to be personally involved in the design of the services in order to try and test the service before using it and see demonstrations of how this service works and what it can offer.
- Technology lovers must be used as an advertising tool to elevate the E-Payment awareness of their relatives, friends and colleagues.

REFERENCES

- Agarwal, R., & Prasad, J. (1998), The antecedents and consequents of user perceptions in information technology adoption. *Decision Support Systems*, 22(1), 15-99.
- Ajzen, I. (1991) The Theory of Planned Behavior, Original Article: "Organizational Behavior and Human Decision Processes", 50(2), 179-211.
- Babae, N (2010), Investigating Effective Factors and Presenting a Practical Guideline to Adoption of Mobile Ticketing. Lulea University of Technology, Dept. of Business Administration and Social Sciences.
- Bateson, J. E. G. (1991). *Managing Services Marketing*. (2nd Ed.). The United States of America: The Dryden Press
- Chen, Liang-Hsuan (2008) "Internationalization or International Marketing? Two frameworks for understanding international students' choice of Canadian universities" *Journal of Marketing for Higher Education*, 18(1), 1-33
- Creswell, J.(1994) *Research design qualitative & quantitative approaches*. London: Sage.
- Cochran, W. G. (1977) *Sampling techniques* (3rd ed.).New York: John Wiley & Sons.
- Curran, J. M. & Meuter, M. L. (2005) 'Self-service technology adoption: Comparing three technologies'. *Journal of Services Marketing*, 19(2), 103-113.
- Dabholkar, P.A. (1992), "Role of affect and need for interaction in on-site service encounters", in Sherry, J.F. and Sternthal, B. (Eds), *Advances in Consumer Research*, 19, Association for Consumer Research, Provo, UT. , 563-9.
- Davis, F.D. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information technology", *MIS Quarterly* , 13(3), 319 – 340.
- Drennan, J., & Coll-Kennedy, J. R. M. (2003). The relationship between Internet use and perceived performance in retail and professional service firms. *Journal of Services Marketing*, 17(3), 295-311.
- Featherman, M. S., Valacich, J. S., & Wells, J. D. (2006). Is that authentic or artificial? Understanding consumer perceptions of risk in e-service encounters. *Information Systems Journal*, 16(2), 107-134.
- Fishbein, M. & Ajzen, I.(1975) *Belief, attitude, intention, behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Gupta, A. and Rogers, E. (1991) " Internal Marketing: Integrating R&D and Marketing Within the Organization" *The Journal of Service Marketing* 5(2), pp.55-68.
- Jiménez-Jiménez, D. and Sanz-Valle, R. (2011), "Innovation, organizational learning, and performance", *Journal of Business Research*, 64(4) , 408-17
- Kenkel, N.C., Juhasz –Nagy, P. & Podani, J. (1989) 'In sampling procedures in population and community ecology'. *Vegetatio*, 83, 195-207.
- Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607-610.
- Laroche, M., Bergeron, J., & Goutaland, C. (2003). How intangibility affects perceived risk: The moderating role of knowledge and involvement. *Journal of Services Marketing*, 17(2), 122-140.
- Liu, J.Y., Tarn, J. M. & Wen, H. J. (2004). Adopting e-commerce web site operation modes: The current state of large US firms.

- Information Management & Computer Security, 12(1), 73-90.
- Lu, J., Yao, J. E., Yu, CS (2005). Personal innovativeness, social influences and adoption of wireless Internet services via mobile technology. *Journal of Strategic Information Systems*, 14, 245–268.
- Mallat, N., Rossi, M., Tuunainen, V. K. & O' o' rni, A.(2008) An empirical investigation of mobile ticketing service adoption in public transportation. *Pers Ubiquit Comput*, 12.57-65.
- Mitchell, V. (1999). Consumer perceived risk: Conceptualizations and models. *European Journal of Marketing*, 33(1/2).
- Mitchell, V., & Greatedorex, M. (1993). Risk perception and reduction in the purchase of consumer services. *The Service Industries Journal*, 13, 179-200.
- Murray, K. B. (1991). A test of services marketing theory: Consumer information acquisition activities. *Journal of Marketing*, 55, 10-25.
- Parasuraman, A., & Grewal, D. (2000). The impact of technology on the quality–value–loyalty chain: A research agenda. *Journal of Academic of Marketing Science*, 28, 168–174.
- Patrick, K. and Dotsika, F. (2007), "Knowledge sharing: developing from within", *The Learning Organization*, 14 (5), 395-406.
- Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnla, S. (2004). Consumer acceptance of online banking: An extension of the technology acceptance model. *Internet Research*, 14(3), 224 – 235.
- Ryan, H.E., Lo, J. & Johnson, R.S. (1998). HIF-1 alpha is required for solid tumor formation and embryonic vascularization. *EMBO J.*, 17, 3005–3015.
- Sahut, J. (2008) "Internet paymaneyt and Banks", *International Journal of business*, 13(4), Available at SSRN: <http://ssrn.com/abstract=1755495>
- Steiner, I (2002). Online Payment Services: An Overview. Available: <http://www.auctionbytes.com/cab/abu/y202/m11/abu0083/s02>,
- Straub, E. (2009), "Understanding Technology Adoption: Theory and Future Directions for Informal learning", *Review of Educational Research*, 79(2), pp. 625-649
- Temple, P. (2006), "Branding higher education: Illusion or reality? Perspectives: Policy and Practice in Higher Education, 10(1), 15-19
- Venkatesh, V., Morris, M. G., Davis, G. B., Davis, F. D.(2003) "User Acceptance of Information Technology: Toward a Unified View," *MIS Quarterly*, 27(3), 425-478.
- Whiteley, D. (1999), "Internet Commerce – Hot Cakes and Dead Ducks," in Sudweeks, Fay, & Celia T. Rom (Eds.), *Doing Business on the Internet: Opportunities on the Internet* London: Springer, 9-20.
- Zeithaml, V. (1991). How consumer evaluation processes differ between goods and services. In C. Lovelock (Ed.), *Services Marketing* (pp.39-47). New Jersey: Prentice Hall.