

TOWARDS SUCCESSFUL E-PAYMENT SYSTEMS: AN EMPIRICAL IDENTIFICATION AND ANALYSIS OF CRITICAL FACTORS

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Abstract

This research aims to explore the factors relating to e-payment system to be implemented where electronic processes enable the facilitation of online transactions. A secondary analysis revealed six factors which are argued to be 'critical' for customer adoption of these systems. The findings were further augmented by an online survey of 155 respondents where the perceived importance of the critical factors were correlated through: security, trust, perceived advantage, assurance seals, perceived risk and usability. The results demonstrate that three of the critical factors were necessary (security, advantage, web assurance seals) and three were relatively sufficient (perceived risk, trust and usability) through customer intentions to adopt an e-payment system. The study provides a valid overall awareness that these critical factors are important in designing a successful e-payment system.

Keywords: e-payment systems, TAM, online payment systems.

1 INTRODUCTION

With the growth of e-commerce the importance of transferring money online has become an important issue to potential customers. These e-payments systems can be classified commonly as direct online credit/debit payments, mediated credit/debit payments, stored—value money and electronic bill payments (Fazlollahi, 2002; BITPIPE, 2006).

The traditional e-payment systems are noted to have many limitations which inhibit customers from adopting them. Previous research suggests that some of these factors relate to lack of trust, security, usability, high transaction cost, lack of perceived advantage and perceived risk. These factors are deemed to be important to provide customers with the confidence to switch to an online payment system. Moreover customers will stop engaging in online activities if these prerequisites are not facilitated in the payment systems, thus it will cause merchants to lose on potential online sales (Abrazhevich, 2004).

One of the major concerns with regard to e-payments is said to be security. This is so because money and information could be exchanged online without any direct engagement with the recipients. The main concern in this aspect is credit card fraud (Leong, 1998). Perceived risk is another important factor which affects customer confidence in e-payments. The risk of losing personal information and credit card details going to the hands of hackers are still a major anxiety for customers. In addition according to a study conducted by Hoffman et al (1999), 95% web users have refused to provide their personal information to web sites and 40% have claimed that they would fabricate their lost information. Trust in e-commerce transactions is yet another important element in e-commerce (Abrazhevich, 2004). Perceived advantage is also further illustrated by Perceived ease of use (PEOU) and Perceived Usefulness (PU) on e-commerce customer decision making to adopt an e-payment system (Davis, 1989). An important advantage of e-payments which contribute towards PU and PEOU is the convenience it gives by allowing transactions to be completed with least amount of time and

money (Leong, 1998). In addition usability factor it allows customers access to a user friendly systems with ease of navigation.

In order to overcome issues of security, privacy and trust, there is a major emphasize to use Web Assurance seals. Unfortunately these seals have not gained popularity and customers have misunderstood them as eliciting product quality and they do not incorporate them into their purchasing decisions (Kimery and McCord, 2002). Consequently the research questions from the current study relate to identifying the critical factors influencing the adoption of an e-payment system by customers. These issues are considered through both theoretical constructs and empirical analysis.

2 LITERATURE REVIEW AND RESEARCH HYPOTHESES

2.1 Commerce and Online-Payment Systems

E-commerce provides the opportunity to buy and sell products, information and services on the internet. In addition, online e- payments are playing an important role and lack of an effective system could hinder the success of e-commerce development (Goldfinger and Perrin, 2001; Mehta et al. 1995; Khosrow-Pour, 2007). The exponential growth of the internet has triggered the need for novel e-payment systems which are more appropriate for the web rather than traditional payment systems (Panurach, 1996). One of the major problems is micro-payments which were resolved by the introduction of e-cash systems like 'Digicash', 'Millicent' and 'PayBox', etc. Apart from e-cash systems a variety of other payment have evolved like pre-paid cards, payments via phone bills, smart cards and mobile payments. According to Heng (2004), out of 50 different cyber payments the majority failed to gain acceptance and traditional payments are still widely used by customers. Most online transactions are thus conducted via credit/debit cards while other payments are rarely used and have failed to gain acceptance. Consequently, the future of electronic payment systems is hampered by many problems most commonly noted as the lack of 'fit-for-purpose' payment system is the reason why the growth is inhibited (Abrzhevich, 2004). Some of these problems are lack of security, visibility, and efficiency.

2.2 Critical Factors

The extent to which online businesses can build trust significantly influences the willingness of concern to make e-payment purchases (MacInnes, 2005). Security increases customers' beliefs towards trustworthiness and privacy increase attitude towards the internet. All these attitudes influence consumers to make internet purchases more viable and frequent (Tsiakis and Sthephanides, 2005) Another study demonstrated consumers perceive information security and trust in e-commerce has a significant impact on the intention to purchase online (Abrazhevich, 2004).

The critical factors discussed when formulating the hypotheses will influence the level of adoption to different extents. Therefore, customers' attitudes towards e-payments will impact upon the decision to use such systems. Adoption is a term which is hard to explain since it is based on a person's unpredictable behaviour. However, this behaviour can be explained by behavioural theories such Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) and the subsequent Technology Acceptance Models (TAM) (Davis, 1989; Bagozzi et al, 1992).

2.3 TAM (Technology Acceptance Model)

Technology Acceptance Model (TAM) was derived from Theory of Reasoned Action (TRA) (Fishbein and Ajzen, 1975) where TRA illustrates behavioural theories while TAM is more 'Information Systems' specific. Figure 1 illustrates an outline of TAM through its main constructs.

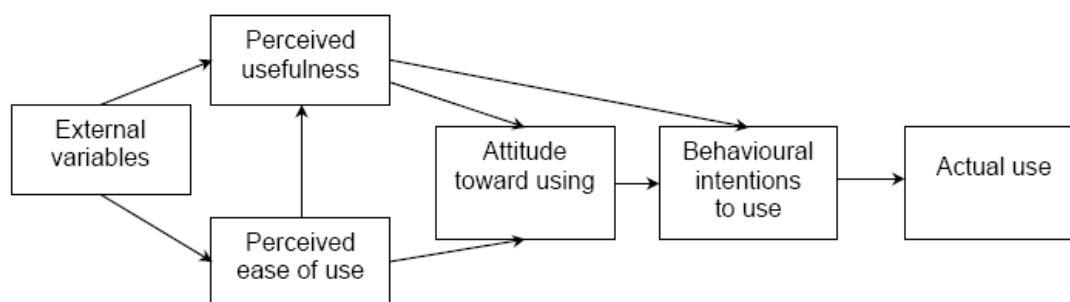


Figure 1: Technology Acceptance Model

TAM identifies and predicts user acceptance attributes before they actually experience it. Davis assumed that user acceptance of technology depends on Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). PU is thus defined as “User’s opinion that after using a system it will increase a user’s job performance within an organization” and PEOU is defined as “the expectation that the software is free of effort.” (Davis et al, 1989). TAM is said to be a good predictor of the intention to use a software package however it is not enough to predict user attitudes towards EPS. One of the main reasons seen is that EPS deals with money exchange and not productivity as illustrated in TAM. However the key factors of this model PU and PEOU was considered to be influential in the capacity of providing perceived advantage to the user’s to influence them to switch to online payments.

2.4 TRA (Theory of Reasoned Action)

The Theory of Reasoned Action (TRA) model is reported to be more appropriate to explain the adoption of e-payment systems. It is thus defined as “a person’s behaviour is determined by his/her intention to perform the behaviour and his/her subjective norms (i.e. social influence)” (Davis et al, 1989). According to TRA user behaviour whether to accept /reject is determined by the influence by a person’s attitudes and subjective norms. Attitude towards the behaviour is defined as the person’s positive/negative feeling about performing a behaviour. It is determined by one’s beliefs regarding the consequences arising from a behaviour and an evaluation of the desirability of these consequences.

The best predictor of behaviour is said to be intention. It is assumed to capture motivation factors that contribute towards behaviour (Fishbein and Ajzen, 1975 cited in Abrazhevich, 2004). Since TRA can be applied to more situations than TAM it was perceived to be more useful. Unlike TAM, TRA take social influences, i.e. share subjective norms, and understands various factors surrounding usage of EPS. Moreover, since EPS are accustomed for personal usage factors like reputation can be highly important to the end user and influence’s their attitudes. In addition PE and PEOU were considered to be as two key factors contributing towards the acceptance of e-payments. User belief and attitude towards privacy, security, and risk will also affect the attitude towards the adoption of e-payments. Therefore this model provides an important guideline to evaluate what factors affect the attitude of the users to use an e-payment system.

E-payments are understood as an important element which contributed towards the success of e-commerce transactions. However, the literature also reveals that novel e-payments have not been successful in totally taking over traditional payments due to their flaws. Therefore, traditional payments are still reported to be the norm. In order to overcome customer concerns e-payment designers should pay attention to the critical factors, which customer’s perceive as important to be included in such transactions. Such factors are noted as, security, perceived risk, and trust, and perceived advantage, usage of web assurance seals and usability of the websites. In order to portray user attitudes towards adoption TAM and TRA, models were also illustrated.

3 FORMULATING HYPOTHESES

3.1 (H1) – Perceived Risk

Bauer (1960) earlier reported perceived risk relates to uncertainty and consequences associated with a consumer's action. The level of risk is said to diminish when individuals trust others who are involved in the transactions (Featherman and Pavlov, 2003). Kim and Prabhakar (2000) ignore the link between perceived risks and trust. However, Jarvenpaa et al (2000) report that risk mediates the role between willingness and trust to purchase online. Further research conducted on the impact of perceived risk on consumer decision-making in using online transaction activities, revealed that customers are less motivated to adopt new payment methods when they perceive the risk of adopting them are greater than old ways of payment (Jarvenpaa et al, 2000). As a result of disclosing personal information the customers could face economic risk and privacy risk. If a customer chooses to pay online he will face the risk of fraud / theft, hacking, password stealing. Hence the decision whether to pay online/not is influenced by perceived risk.

H01: The intention to adopt an e-payment system has no relationship between perceived risk

H1: There is a relationship between intention to adopt an e-payment system and perceived risk

3.2 (H2) - Security

Security may be defined as protecting the details of transactions and customers from internal and external fraud/criminal usage. People may fear to transact and pay online fearing that their personal information might get stolen. Security remains as one of the most crucial and well researched areas of study in payment systems (Abrazhevich, 2004). Concerns about security in the network area reveal that there need to be further improvements in the electronic payment protocol to enhance trust in online payment systems. Due to the increase in bank mergers and acquisitions customers are sceptic about the security of online payments (Abrazhevich, 2004). It is agreed that online sales are not as safe as conventional sales people are suspicious since there is no human factor involved in the sale and it's done in a virtual setting (Whiteley, 2000). Existing literature recognizes that security concerns of users and effect it has on the adoption of electronic payment systems (Kurnia and Benjamin, 2007).

H02: The intention to adopt an e-payment system has no relationship with security

H2: There is a relationship between intention to adopt an e-payment system and security

3.3 (H3) - Perceived Advantage

Technology Acceptance Model (TAM) has been used interchangeably to understand the technology acceptance behaviour and to decide the adoption decisions of various e-commerce activities (Abrazhevich, 2007). Many customers are said to be inquisitive about the use of credit cards in an online payment system. Therefore, financial transactions systems have been developed to overcome this. Moreover these systems have encouraged customers to perform streamline transactions and personalized services transactions can be performed within a click of a mouse and the need to duplicate form filling has diminished (Riggins and Rhee 1999) Convenience of usage in adopting EPS occurs when customers can pay their bills on line at any time anywhere in the world. In the conventional method a customer has to wait till the bill is posted hence this would motivate them to adopt an e-payment system. Adopting such a system is would be cost effective as it reduces the need of the customer to do paper work and post bills.

H03: The intention to adopt an e-payment system has no relationship with perceived advantage

H3: There is a relationship between intention to adopt an e-payment system and perceived advantage

3.4 (H4) - Trust

Trust is customer's confidence that their money and personal information would not be used against their personal interest. On the contrary even if we use an imperfect system they want to believe that vendors, banks and credit card companies will not misuse them (Abrazhevich, 2004). The other aspect is that customers should trust the payment system adopted by the other user. The existing literature points out that high level of user confidence and trust in EPS is a contributing factor for the successful adoption of e-payment systems (Kurnia et al, 2007). In analyzing the success of the Octopus system it was found that trust in the systems was the contributing factor for its wide usage. This finding was backed by the survey conducted by Abrazhevich who found out that customers will not use systems which they perceive to be as less trustworthy. Similarly another study proved that if trustworthiness is there, adoption of EPS is credible (Kniberg, 2002). Higher the levels of consumer's trust higher the degree of purchase intentions of consumers and it is convenient for them to retain consumers.

H04: The intention to adopt an e-payment system has no relationship with perceived Trust

H4: There is a relationship between intention to adopt an e-payment system and perceived Trust

3.5 (H5) - Web assurance seals

Web Assurance Seals are important mainly as high perceivers of outcome risk and low perceivers do not pay much attention to them (Roselius 1971). Third party assurance seals will play an important role in reducing the perceived risk involved with the purchase (Dowling and Staelin, 1994). To reduce customer's concern over the privacy and security variety of web assurance seals have been developed. Some of these assurance seal services on the web are Web Trust, VeriSign, Trustee, and BBB Online are confirming whether the vendor is trustworthy/not. E-commerce assurance seals services are defined as Web assurance services (WASSs) for Internet e-retailers' sites by third party certifying bodies (e.g. banks, accountants, consumer unions and computer companies). It could also be perceived as widely a signal to other parties that the site conforms with the required standards.

It is argued that the need for seals of approval is greater in e-commerce than in traditional brick and mortar environments. This is due to some payment features like the need to give personal information (e.g. name, phone number) and payment information like credit/debit card numbers (Miyazaki and Fernandez, 2001). It is said that other remote purchases like telephone and mail-order shopping face relatively higher consumer risk and with e-commerce the situation will aggravate. Hoffman et al (1999) have argued one of the ways to reduce consumers' perceived risk is to use seals of approval from trusted third parties. It is also used as a co-branding strategy where vendors use these seals to convince the customers that a certain level of standard is met and it is safe to provide personal information. Nikitkov and Bay (2002) found that lack of physical presence will increase the perceived risk of customers and it could be reduced by increasing website trust using web assurance seals. However the rate of awareness and adoption of such logos are limited.

H05a: The intention to adopt an e-payment system has no relationship with using web assurance seals

H5a: There is a relationship between the intention to adopt an e-payment system and web assurance seals

H5b: There is a relationship between perceived risk and web assurance seals

3.6 (H6) - Usability

It should not be a sophisticated complex task to pay online and it could be done in a user-friendly manner. This requirement can be shown by ease of use. If the payment process takes a lot of time and is complicated it would demotivate the customer and he/she will refrain from using other web activities as well. Amazon has adopted 1-click approach for payments to reduce the hassle for the customers in the authentication process. If customers perceive more convenience through online

search for information they will most probably switch to search for information online (Yuan Gao, 2005).

H06: The intention to adopt an e-payment system has no relationship with Usability

H6: There is a relationship between intention to adopt an e-payment system and Usability

3.7 Research Model

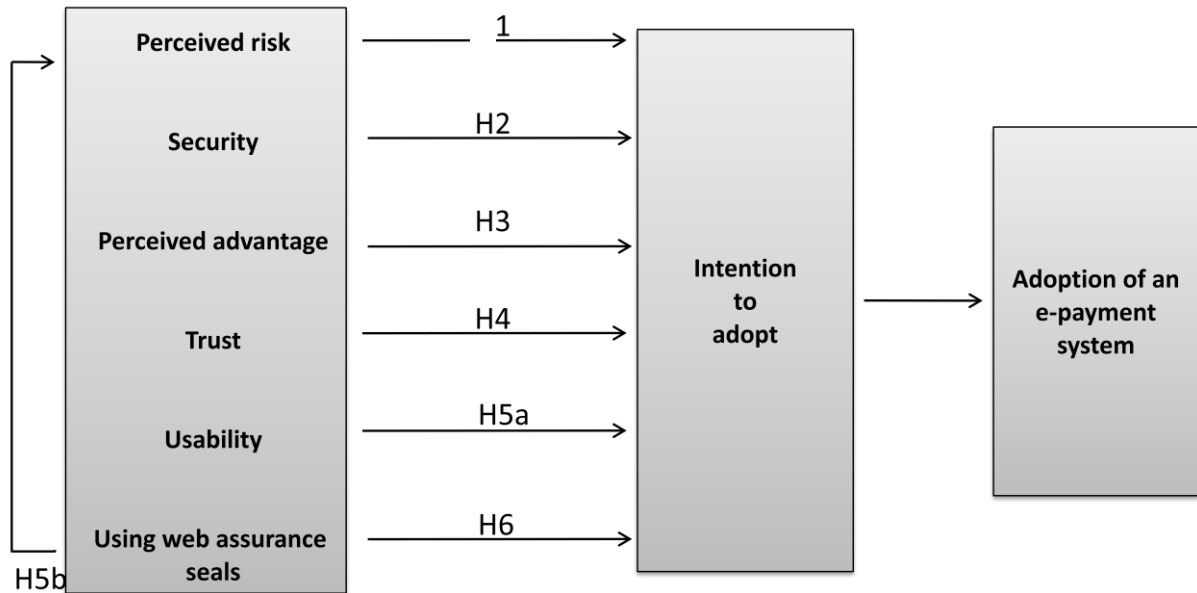


Figure 2: Research Model

4 RESEARCH METHOD

In order to build an awareness of the subject area, the researchers used secondary data, i.e. journal articles, books, internet resources. The research mainly uses the deductive approach to gather primary data where theory and hypotheses are developed in order to prove a theory. The research on this basis of what is known about a particular domain is developed from hypotheses which will undergo empirical scrutiny (Bryman, 2007). According to Bryman (2007), this particular approach needs to be chosen if there is ample literature on a particular area. A survey can be defined as a way to collect data from a range of respondents needed to capture facts, opinion and attitudes. It mainly consists of three components; structured interviews, observations and questionnaires. This method allows collecting a large amount of data from a sizable population in an economical manner (Saunders, Lewis and Thornhill, 2007). For the current research a survey method was chosen since it is economical and allows the researcher to gather data from a larger sample in addition since one could find ample literature on this subject area.

An anonymous and self-administered survey was developed. The survey was web-based and was e-mailed to the respondents. The response rate was 77.5% (155 out of 200). Web-based surveys are said to have become a taken-for-granted part of business and domestic living pattern hence it has become very popular contemporary. These types of surveys are mainly attractive due to many reasons. It is customized for individual respondents rather than in a postal survey, it is dynamic and interactive and the results can directly be uploaded to a spreadsheet like SPSS/MS Excel (Easterby-Smith et al, 2008).

The questionnaire consisted of 23 close-ended questions categorized into 3 sections. The first section solicited 8 close ended questions which mainly try to find out customer's experience of using e-payment systems and their awareness and likelihood of using such a system. In the second part, there

were 12 5-point Likert scale type questions to measure the main constructs of the study: perceived risk, perceived advantage, trust, security, use of web assurance seals and usability. The final section had three questions asking basic demographics like, age, gender and educational background of the respondents.

5 DATA ANALYSIS

A total of 155 questionnaires were coded and analyzed using SPSS to analyse the hypotheses. It consists of four parts demographic variable frequencies, analysis of usage of e-payments, critical factor analysis and testing of hypotheses. Frequencies are drawn to identify the demographic distribution of e-payments systems usage. Demographic characteristics of survey participants are depicted in Table 1.

Table 1. Demographic characteristics of survey participants

Characteristic	Percentage (%)
Age (years)	
Below 15	1.2%
15-18	11%
19-23	37.7%
24-28	20.1%
29-35	9.9%
36-42	9.5%
Above 42	10.6%
Gender	
Female	41.6%
Male	58.4%
Education	
Postgraduate	38.8%
Undergraduate	28.3%
Associate	8.8%
Doctorate	8.5%
HighSchool	15.6%

5.1 E-payment systems usage experience

Table 2. Internet use and e-payment activities

Internet use	
Have you used the Internet to carry out transactions before?	
Yes	79.87%
No	20.13%
E-payment activity	
Online shopping- Online banking	33.9%
Other activities (each)	<10%
E-payment use	
Did you experience any problem using an online payment system?	
Yes	
Yes, but not significant	12.2%
No	13.2%
Maybe, I cannot recall.	66.7%
	7.9%
Types of problems	
Delays in processing	24.4%
Less user friendly	51.2%
Unauthorized transactions	12.2%

Loss of information	12.2%
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The data revealed 79.87% of the respondents were e-payment users however 20.13% of them have not transacted online before. It also points out the fact that e-payments are popular among people. According to the data 33.9% of all users have used the internet to carry out online shopping and online banking. On line shopping followed by on line banking were rated as the most popular activities to transact online. As shown in Table 2, from all the respondents 66.7% had not dealt with any problems with regard to e-payment systems. However 13.5% of the total respondents had faced problems of which 12.2% of them have faced serious problems of paying online line, like loss of information and unauthorized transactions. Majority of respondents about 51.2% have felt e-payment systems to be less user-friendly and complicated. Moreover, 24.4% of the total respondents have perceived them to be having delays in processing the actual transactions. It could be understood that these reasons could have triggered some users to refrain from paying online however there could be more reasons which are analyzed in the following section as critical factors.

5.2 Critical Factors and Online Payments Experience

Previous statistics showed that 66.7% of the respondents have not dealt with any problem of using e-payments. This trend has affected the intention to purchase online again as shown 57.1% of the total respondents would definitely purchase on line again and 31.1% would probably opt to use e-payments again. A small percentage opt not to pay online again in which 7.1% would never pay online again, 2.4% of them would probably not and the same percentage of people were in doubt whether to use e-payments again. Table 3 illustrates the percentages graphically.

Table 3. Intention to use and order of importance of critical factors

Intention to purchase online in the future	
I might but not sure	2.4%
I will never pay online	7.1%
No, probably not	2.4%
Yes, probably	31.1%
Yes, definitely	57.1%
Order of importance of critical factors	
Security	57.48%
Trust on the payment method	11.02%
Usability	9.45%
Using web assurance seals	1.57%
Perceived advantage	6.3%
Perceived risk	6.3%
All	7.87%

Respondents were asked to rate which critical factors they would perceive to be as most important. Most of them some 57.48% rated security as the most important factor. Trust (11.02%) was perceived to be as the next most important factor. They also rated Usability (9.45%) as the third most important issue and 7.87% perceived all the factors to be important. Using web assurance seals was perceived to be the least important critical factor among all of them.

The attitudes of the respondents of using e-payment systems were also tested. Most of them disagreed to the fact that the risk of using online payments was low for them. In addition they did not perceive revealing personal information online as less risky. Security of using online payments was considered to be as important and they also agreed to stop using e-payment systems if they breach security. Respondents disagreed to use e-payments even if they were protected using web assurance seals. They felt neutral about the perceived advantages e-payments provide which were the ability to learn them quickly and the ability to save time and money. Most respondents disagreed to fact that e-payment

systems are complicated and they felt neutral to the fact of ease of use and user friendliness of e-payment systems.

6 HYPOTHESES TESTING

In order to test the hypotheses Pearson's correlation analysis was utilized. Pearson's product moment coefficient (r) is a parametric technique which portrays the strength of the relationships between two variables. A correlation coefficient was also perceived as a 'statistical' device used to measure the strength/degree of supposed linear relationships between two variables. It is said to take the value from -1 to +1. The sign in front denotes the nature of the relationship and the absolute number provides an indication of the strength of the relationship. The interpretation of the value lies between 0 and 1 was according to Cohen (1988) guidelines as follows, $r=.10$ to $.29$ or $r=-.10$ to $-.29$ is indicated as small, $r=.30$ to $.49$ or $r=-.30$ to $-.49$ is indicated as medium and lastly, $r=.50$ to 1.0 or $r=-.50$ to -1.0 is in the scope of large. The level of criticality of each dimension is represented by its Pearson Correlation results. All hypotheses are analyzed with Pearson Product Moment Correlation Coefficient at the significant level of 0.05. The hypotheses will not be accepted if the significant level (2-tailed) is less than 0.05. The results of testing hypotheses are shown below.

6.1 Hypothesis One

H1: There is a relationship between intention to adopt an e-payment system and perceived risk

The relationship between perceived risk and intention to adopt an e-payment system was tested. The results were analyzed at a significance level of 0.05. Accordingly the test revealed that there was no relationship between intention to adopt e-payment systems and perceived level of risk. The significant level is at 0.456 ($p \geq 0.05$).

Factors	the intention of an individual to adopt an e-payment system	
	r	Sig (2-tailed)
The risks of credit card fraud for online transactions are low for me	.068	.456

* Correlation is significant at the 0.05 level (2-tailed).

Hence, the results proved that the risk of credit card fraud of online transactions has no influence on the intention to adopt an e-payment system therefore the hypothesis is rejected.

6.2 Hypothesis Two

H2: There is a relationship between intention to adopt an e-payment system and security

The results revealed $r=0.267$ at a significance level of 0.003. The significant level is at 0.003 ($p < 0.05$). In other words, the results proved a positive relationship between security and the intention to purchase online. However according to Cohen's model $r=0.267$ belongs to the small correlation category hence one could argue that there is a small positive correlation between security of the e-payment systems and the intention to adopt an e-payment system.

Factors	the intention of an individual to adopt an e-payment system	
	r	Sig (2-tailed)
I will stop using an e-payment when I hear there was a breach in security	0.267	0.003

** Correlation is significant at the 0.05 level (2-tailed).

Hence it is concluded that there is a positive correlation between the risk of credit card fraud and the intention to adopt an e-payment system, therefore the hypothesis is accepted.

6.3 Hypothesis Three

H3: There is a relationship between intention to adopt an e-payment system and perceived advantage

The results revealed $r = -0.298$ which is a negative relationship. This was at a significant level of 0.001 ($p < 0.05$) which is less than the benchmark of 0.05 therefore this hypothesis is accepted. It proves that there is a relationship between the intention to adopt an e-payment system and perceived advantage of the system however it is a negative relationship.

Factors	the intention of an individual to adopt an e-payment system	
	r	Sig (2-tailed)
Learning to use online payment systems is easy	-0.298	0.001

** Correlation is significant at the 0.05 level (2-tailed).

6.4 Hypotheses Four

H4: There is a relationship between intention to adopt an e-payment system and perceived Trust

The results revealed $r = -0.319$ which proves a negative relationship. This was at a significance level of 0.089 ($p > 0.05$). It also means that there is no relationship between the intention to adopt an e-payment system and perceived trust. Therefore since the significance is more than 0.05 this hypothesis is rejected.

Factors	the intention of an individual to adopt an e-payment system	
	r	Sig (2-tailed)
I would stop using an e-payment system if it is not trustworthy	-0.319	0.089

** Correlation is significant at the 0.05 level (2-tailed)

6.5 Hypothesis Five A

H5a: There is a relationship between the intention to adopt an e-payment system and web assurance seals

The results showed $r = 0.179$ which means that there is a positive strong linear correlation between the intention to adopt an e-payment system and using web assurance seals. This is at a significant level of 0.045 ($p < 0.05$). Therefore once could come to the conclusion that using web assurance seals will have an effect on the intention to pay online and it is positively related.

Factors	the intention of an individual to adopt an e-payment system	
	r	Sig (2-tailed)
I will pay online if the payment method is assured using a web assurance seal	0.179	0.045

6.6 Hypothesis Five B

H5b: There is a relationship between perceived risk and web assurance seals

		The risks of credit card fraud for online transactions are low for me	I would be free to give out my personal information when transacting online
Using web assurance seals make the e-payment system less risky (eg. Verisign, BBB Online)	Pearson Correlation	.271(**)	.223(*)
	Sig. (2-tailed)	.002	.012
	N	123	127
I will pay online if the payment method is assured using a web assurance seal	Pearson Correlation	.351(**)	.360(**)
	Sig. (2-tailed)	.000	.000
	N	124	128

** Correlation is significant at the 0.05 level (2-tailed).

The results demonstrate that there is a positive linear correlation between using web assurance seals and the risk of credit card fraud for online transactions and the willingness to give out their personal information when transacting online. It also proved a positive correlation between the questions I will pay online if the payment method is assured using web assurance seals and the risk of credit card fraud and giving personal information in online transactions. The figures were respectively, $r = 0.271$, 0.223 , 0.351 , 0.360 and they were attained at a significant level of 0.002 , 0.012 , 0.000 and 0.000 respectively all below the benchmark of 0.05 . Hence, the above stated hypothesis is accepted.

6.7 Hypothesis Six

H6: There is a relationship between intention to adopt an e-payment system and Usability

The results revealed a coefficient of $r = -0.330$ at a significant level of 0.000 . This proves that there is a negative relationship between Usability and Intention to adopt an e-payment system. Since it is at a significant level of 0.000 ($p < 0.05$) the hypothesis is accepted and the null hypothesis is rejected.

Factors	the intention of an individual to adopt an e-payment system	
	r	Sig (2-tailed)
The e-payment system is easy to navigate and user friendly	-0.330	0.000

** Correlation is significant at the 0.05 level (2-tailed).

6.8 Multiple Regression Analysis

Two questions were used to analyze on variable therefore a multiple regression analysis was used to prove which variable affected the dependent variable. In analyzing the effect on intention to purchase (dependent variable) and (independent variable) perceived risk, trust, perceived advantage, using web assurance seals. From diagram R-square value is 32.3% of the variance in the dependent variable which is intention to purchase online can be predicted from its independent variables perceived risk, trust, perceived advantage, using web assurance seals and usability. From Table 2, it can be deduced that the full model is statistically significant ($F(12,101) = 4.008$, $\text{sig} = .000$), the p-value is smaller than

0.05. This suggests the independent variables as mentioned above are reliable predictors of intention to purchase online. Noting Table 4 the equation can be built as: Intention to purchase= 2.330 + 0.117*perceived risk + (-) 0.196 perceived security + 0.018 perceived trust+ (-) 0.047 using web seals + 0.201*perceived advantage + (-) 0.182 usability. Multiple regression analysis is illustrated in Table 4 where accordingly the following conclusions can be derived.

Table 4: Multiple regression analysis and model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.568(a)	.323	.242	.808

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	31.369	12	2.614	4.008	.000(a)
Residual	65.868	101	.652		
Total	97.237	113			

The demographic variables demonstrate initially the majority of e-payment users were undergraduates and postgraduates belonging to the age groups of 19-23 and 24-28. In gender frequencies it revealed men were more like to use e-payments rather than women. Majority of the respondents had dealt with e-payments and most of them used in to conduct online shopping and banking. Most of the respondents had not dealt with any problems e-payments however the once who faced problems had experienced less user friendliness in the payments. Nearly 60% of them agreed to continue paying online and they perceived security as the most important critical factor which needs to be included in the e-payments. Hypotheses testing proved a link between intention to adopt e-payments with security, perceived advantage, and web assurance seals and rejected the link between perceived risk, trust and usability.

7 DISCUSSION

According to previous data perceived risk was only 6.3% important compared to other critical factors similarly respondents agreed that the risk of credit card usage is high for them and they thought providing information online to be risky. According to Pearson's correlation analysis and regression analysis H1 was rejected. It was proven that there no relationship between perceived risk and the intention to adopt e-payment systems. However this was contrary to most of the current literature which proved that only individuals who perceive e-payments as less risky would be motivated to adopt it.

However the findings of another study revealed that perceived risk remains as one of the most important elements in the intention to adopt e-payments but it doesn't have a direct link (Lu, Hsu and Hsu, 2005). It thus explains why customers still adopt online activities in spite of lack of total protection from anti-virus guards. In addition, it affects why customers differ in the adoption of different e-payments systems. Similarly it found that perceived risk plays an important role in the continuous use of e-payments (Lu et al, 2005). Previous research also revealed that consumers who already use e-payment systems would purchase on-line in spite of product related risk. In a similar study conducted on online grocery shopping, it was found that those who find this practice risky do not have a negative attitude towards online payments (Kurnia et al, 2003). Therefore, it is suggested that perceived risk will have an impact on the level of adoption yet the link could be indirect as it may reduce the risk and increase trust and security in order to retain online payments.

The results revealed that H2 was proven since r value was 0.267 at a significance level of 0.03. In addition 57.8% selected perceived security to be the most important issue among other critical factors. Moreover, respondents agreed that they consider security to be an important issue and most of them

agreed to stop paying online if they experience a breach of security. Hence there is a positive relationship between security and intention to pay online. This proposition supports the existing literature. In a set of studies it was found that the most common reason for refusal to buy online was lack of security in the payment method (Pousttchi, 2003). However the correlation between security and intention to use mobile payments was perceived to be very strong in a particular study whereas the current study only showed a small correlation between the two variables. Additional literature suggests that security will have an impact on the level of trust and without trust online transactions will cease to exist (Pousttchi, 2003) Therefore, one could argue security can have an influence on other critical factors hence improving security in the system could motivate customer's to switch to an online payment system. In order to do so vendors must convince customers that web is a safe place to build a long term relationship and that particular company can be trustworthy. The former can be done by educating customers about the safety features available to make their transaction safe like digital certificates, secure servers or third party assurance seals.

The results also revealed 6.3% of all respondents thought perceived risk to be of importance. According to Pearson's correlation it (- 0.298) relationship was at a significant level of ($.001 < p < 0.05$). According to the regression analysis learning to use e-payment systems was rejected and E-payments save time and money was perceived to be accepted. The results revealed that there is a negative relationship between perceived advantage and intention to adopt e-payment systems. However this is contrary to the literature which proves that there is a positive relationship between the two variables. Perceived ease of use is said to have direct link with the intention to adopt e-payments. In another study it was found the main reason for PayPal's success is its simplicity and ease of use. Davis's TAM model (1989) has been found to be a reality as many studies found that perceived ease of use and usefulness to be the contributory factors for the widespread use of e-payment systems. Many merchants want customers to make quick purchases and customers need instant gratification. Users prefer not to be interrupted through the process of payments and to complete a transaction faster compared to traditional payment methods.

The results suggest that H4 was rejected since r was -0.319 at a significance level of $0.089 > 0.05$. In addition multiple regressions proved that the two questions testing trust as rejected. In fact, the frequency analysis also proved that respondents rated 7.8% importance for trust and they were neutral about the questions used to test perceived trust. However existing literature points out that trust plays an important role than security. According to Kniberg (2002) users and merchants are more likely to use an insecure payment system from a trusted company rather than a secure payment system from an un-trusted company. The findings of a similar study revealed a significant relationship between trust in web merchants and intention to use the web for purchasing goods and services, it revealed a significant relationship compared to other variables. Therefore, the present study's results are somewhat contradictory to the past empirical evidence. One could argue that trust alone is not sufficient to motivate customers to switch to an online system since the adoption intention could be triggered by various other critical factors (Hoffman, 1999). Therefore, the results of the current study could hold true since it is not the only motivator.

The findings indicate there is a strong relationship between intention to adopt e-payment systems and the use of web assurance seals. Therefore H5a is accepted in $r = 0.179$ at a significant level of 0.045. However, only 1.57% of respondents thought that using seals in payments would make them adopt them. Multiple regression analysis proved that customer's will pay online if it's assured by web seals to be false. However the literature says that there are only few studies conducted on this area. A particular study revealed that viewing web seals on the web sites had little impact on reducing privacy concerns related to doing business on websites (Kim et al, 2000). Ample research had been conducted to evaluate the effectiveness of these seals they all revealed that customers have low awareness, low familiarity and less recognition about them (Portz et al, 2000; Moores, 2005). Similarly, it was found that only 28% of the respondents correctly identified that these seals guaranteed that the web site is safe to transact and to provide information and 59% thought they guarantee product quality (Portz et

al, 2000). It was also said in order to communicate to the customer the meanings of these seals merchants should create awareness.

The relationship between web assurance seals and perceived risk was tested in H5b. The results were $r=.271$ and $r=.223$ according to Pearson's correlation at significant levels of $0.02 < 0.05$ and $0.012 < 0.05$ it is significant. Hence the hypotheses were proven accepted. According to multiple regressions it proved that both variables were true. However the frequency analysis proved that customers disagreed having web seals would reduce their risk of online transactions. Literature in this area proves the same that the risk would diminish hence customers can provide their private information as it is assured by these seals. Another study revealed third party seals will act as a risk reliever even if they are not totally considered by customers (Dowling and Staelin, 2004). Therefore empirical evidence proves a positive relationship between the links between these two variables. However a similar study as discussed above proved that customers misunderstood these as an indication of product quality. Therefore, vendors must educate online purchasers about the mission of these seals.

The relationship between usability and intention to adopt e-payments was tested in H6. The hypothesis was proven since $r=-0.330$ at a significance level of 0.000. It revealed a negative relationship between intention to adopt e-payments and usability. In other words if usability is perceived in the system people will not use it and vice versa. Respondents found usability 9.45% important compared to other critical factors. According to frequency analysis respondents agreed using an e-payment systems is complicated and they felt neutral about the user friendliness and ease of navigation of it. Multiple regressions proved Q19 accepted and Q20 rejected. This is somewhat contradictory to past literature where a number of researches had been conducted on usability and its importance to e-commerce. A previous study by Szymanski and Hise (2000) usability factors like site design (searching capabilities and site organization) were strong indicators of satisfaction. Another study found that usability indicates the quality for websites (Agarwal and Venkatesh, 2002). Similarly it was found web site design would lead to ease of use and thus it leads to usability of the system. Therefore, in order to increase usability it should be made more user-friendly and should use more annotations with ease of navigation.

The findings of the research demonstrate the importance of e-payment systems as a main e-commerce activity. As noted these can be classified according to various specifications. However online credit/debit cards seem to be the most popular method of transacting online. The research revealed that respondents have mostly used e-payment systems to carry out on-line shopping and banking. It was found that people are still lagging behind the adoption of e-payments systems due to many reasons. Therefore, merchants must investigate to see what inhibits them from actually paying online. The current research was carried out to address that issue by identifying six critical factors that customer perceive as important for e-payments.

Perceived risk is one of the main elements which were identified as important in previous research and literature. Perceived risk was said to be negatively related with the intention to adopt e-payments however the current study proved no relationship between the variables. In order to reduce the risk of fraud e-payment systems could be secured using SSL and SET encryption technologies. In addition they could enhance security and trust in the systems which will reduce the risk perceived by customers. Security which proved to have a link with the intention to adopt e-payments was cited as the most important critical factor in the past research. In order to increase security merchants can use secure transaction technologies, shopping carts, clear navigation sites, speed of delivery and trust. Perceived trust was another critical factor which was thought to be as important however the current study showed that there was no relationship between trust and intention to adopt e-payments. Past research point out that developing perceived risk and perceived security are means of developing online trust. Perceived advantage which is another critical factor was found to have a link between the intentions to adopt e-payments. In order to increase ease of use and usefulness e-payments could be made efficient and less time consuming. Using web assurance seals could be made effective by educating the on line customers about their functionality and including user feedback. Another critical factor which was tested was usability of the website it proved to have no relationship between the

intention to adopt e-payments. However this was thought to be important in the past literature and in order to enhance usability the websites could be made more user friendly with annotations, improve information downloading speed, web site layout were cited as some of the key points in this context.

8 LIMITATIONS AND IMPLICATIONS FOR FUTURE RESEARCH

The current research has only selected a set of critical factors to be as important. However, there are many other factors cited as important in past literature, Delphi survey has pointed out nearly 20 odd characteristics of e-payments (Khosrow and Herman, 2001). In addition, the survey was conducted online hence the ability to get detailed feedback of the participant's attitude towards e-payments was not feasible. Therefore future research could consider more critical factors using questionnaire method.

The research was mainly focused on students of various levels of education. In addition it was collected from mostly University students. However, future research could conduct a survey on various other social backgrounds. Demographic variables prove to have an impact on e-payments according to past literature (Banerjee et al., 2005; Garbarino et al., 2004). Nevertheless, the present study ignored the impact of these variables. Thus future work could incorporate demographic variables as part of their analysis. Past studies indicate that e-payments consist of many types yet the research considered e-payment as a whole, due to the low response rate about the novel payment systems as altered from the pilot study. Future studies could research on why novel e-payment systems still lag behind to other means of payments. In addition, more statistical analyses could be incorporated to the impact each critical factor has on the level of adoption. Furthermore, the analysis could be usefully considered further through the lens of an established theoretical model such as TAM (Davies, 1989) to enhance the explanatory power of the derived constructs.

9 CONCLUSION

This study attempted to confirm the adoption of e-payment systems as a means of facilitating online transactions. A series of factors were identified from the literature which claim to be significant in this respect. The research in this paper sought to empirically test these constructs and to demonstrate which were most critical for e-payment success. It was concluded that security, trust, perceived advantage, assurance seals, perceived risk and usability were most evident. The study is argued to represent a rigorous analysis of these factors which will be of value to systems designers and policy makers working within online transacting environments.

10 REFERENCES

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