

Adoption of e-Payment Systems: A Review of Literature

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Abstract: *E-payment system is increasingly becoming a daring means of payments in today's business world. This is due to its efficiency, convenience and timeliness. It is a payment system that is continuously being embraced and adopted in the financial system of both developed and developing countries with a view to simplify and ease payments in business transactions. As a result, many studies were conducted around the globe by scholars on e-payment adoption. It is based on this that this research paper looks at the available past literature on e-payment adoption across the world, with a view to highlight the scope, methodology and Information System (IS) models used by previous researchers so as to identify research gaps and recommend such for future studies. The study employed an extensive literature search on e-payment adoption with the aid of Google Scholar for those recent studies between the years 2010-2015. To facilitate the understanding of the issue under study, previous studies were analysed based on scope-geographical location of the study, theories/models adopted and methodology used. Finally, the paper has identified the patterns of previous researches with regards to these three items and further highlights and recommends key areas in which future research should delve on.*

Keywords: E-Payment, E-Commerce, Cashless Economy

1. INTRODUCTION

The emergence of Information and Communication Technology (ICT) had completely changed the lives and operations of individuals and organizations respectively. ICT and Digital technologies had made great evolutionary development in finance, economics, operational costs (Slozko & Pello, 2015) and enhanced organizational performance (Ali, 2010). The era of ICT and digital innovations has come along with a dynamic change in the world business environment, whereby business transactions are constantly shifting from cash-based transactions to electronic-based ones (Mohamad, Haroon, & Najiran, 2009). Also, the global proliferation of the internet and its rapid use over the years had contributed much in facilitating electronic commerce in global business environment (Fernandes, 2013).

Consequently, as transactions among business partners continue to proffer on the e-commerce platform, an electronic payment solution emerged to replace the former cash-based payment systems (Dennis, 2004). The advent of this development in the global business environment challenged most

organizations to automatically switch from the conventional paper-based money transactions to an electronic payment system which is widely known as the e-payment system. Generally, electronic payment can be defined as a platform used in making payments for goods/services purchased online through the use of internet (Roy & Sinha, 2014).

Subsequently, with the introduction of e-payment system, the world payment system turned out to align with the current trend of cashless transactions among individuals, businesses and governments (Odi & Richard, 2013). As a result of this, the world payments system is gradually changing from coins and paper based money to electronic forms that provide more convenient, fast and secured process of making payments among individual and organizations (Premchand & Choudhry, 2015). Similarly, the global annual non-cash transactions being facilitated by e-payment and mobile payment (m-payment) had been on the increase over the years, except for 2012 where it decelerates from an annual growth rate of 8.6% in 2011 down to 7.7% in 2012 (World Payment Report, 2014).

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E-payment systems are important mechanisms used by individual and organizations as a secured and convenient way of making payments over the internet and at the same time a gateway to technological advancement in the field of world economy (Slozko & Pello, 2015). In addition, it has also become the major facilitating engine in e-commerce through which electronic business success relied upon. Electronic payment system had also brought about efficiency, fraud reduction and innovativeness in the world payment system (Oladeji, 2014).

Furthermore, e-payment system tends to bring many electronic modes of payments through which financial institutions offer different e-payment opportunities and services to their customers such as the credit cards, debit cards, on-line banking and mobile banking (Premchand & Choudhry, 2015). As a result, the adoption of e-payment technology is ever increasing in today's business environment (Balogun, 2012) and public sector establishments (Kaliannan & Awang, 2010; Hussein, Mohamed, Ahlan, & Mahmud 2010; Gil-Garcia & Luna-Reyes, 2003). However, despite all these benefits associated with e-payment, adequate ICT know-how among users and fear of security breach remain the most concern of individuals, organizations and experts in the field of information system (Khairun & Yasmin, 2010).

However, much empirical studies had been conducted on e-payment systems with the aim of investigating factors that influence its use and adoption. In view of this, this aim of this paper is to review the findings from such previous studies and to suggest directions for further research in that field.

The main sections of the paper will discuss the various definitions of e-payment, types, and its brief historical development. Last sections of this paper provides an analysis of various empirical studies conducted on e-payment adoption around the globe based on critical issues ranging from methods used, adapted models, and scope with a view to recommend areas that need further research.

2. E-PAYMENT SYSTEM

2.1. Definition of E-Payment

In the last two decades, electronic payment systems (EPS) have attracted much attention from researchers and information system designers due to their vital role in modern electronic commerce.

This led to wide and in-depth researches that produced different perspectives on e-payment definitions among others. These definitions were mainly viewed from different perspectives ranging from scholars in the field of accounting and finance, business technology to those in information systems. For instance, Dennis (2004) defines e-payment system as a form of financial commitment that involves the buyer and the seller facilitated via the use of electronic communications. Also, Briggs and Brooks (2011) sees e-payment as a form of inter-connections between organizations and individuals aided by banks and inter-switch houses that enables monetary exchange electronically.

In another perspective, Peter and Babatunde (2012) viewed e-payment system as any form of fund transfer via the internet. Similarly, according to Adeoti and Osotimehin (2012), electronic payment system refers to an electronic means of making payments for goods and services procured online or in supermarkets and shopping malls. Another definition suggests that e-payment systems are payments made in electronic commerce environment in the form of money exchange through electronic means (Kaur & Pathak, 2015).

Furthermore, Kalakota and Whinston (1997), sees electronic payment as a financial exchange that takes place online between the seller and the buyer. Moreover, Humphrey and Hancock (1997) are in the opinion that electronic payments refer to cash and associated transactions implemented using electronic means. E-payment is also defined as payment by electronic transfer of credit card details, direct credit or other electronic means other than payment by cheque and cash (Agimo, 2004).

Antwi, Hamza, and Bavoh (2015) defined e-payment as a payer's transfer of a monetary claim on a party acceptable to the beneficiary. Lin and Nguyen (2001) define e-payment as payments made via the automated clearing house, commercial card systems and electronic transfers. Shon and Swatman (1998) define e-payment as any exchange of funds initiated via an electronic communication channel. Gans and Scheelings (1999) define e-payment as payments made through electronic signals linked directly to deposit or credit accounts. Hord (2005) also sees e-payment as any kind of non-cash payment that does not involve a paper cheque.

Also, Teoh, Chong, Lin, and Chua (2013) viewed e-payment as any transfer of an electronic value of payment from a payer to payee through an e-payment channel that allows customers to remotely

access and manage their bank accounts and transactions over an electronic network. In a nutshell, going by the above definitions, e-payment system can simply be defined as a collection of components and processes that enables two or more parties to transact and exchange monetary value via electronic means.

2.2. Brief Historical Development of e-Payment System

The history of e-payment can be traced back to 1918 the time when currency was first moved in United States (U.S) by the Federal Reserve Bank with aid of telegraph. However, that technology has not been widely used in US until the time when their Automated Clearing House (ACH) was incorporated in 1972. Since from that time, the electronic currency became widespread. This enabled U.S commercial banks and its central treasury with an alternative to cheque payment (Graham, 2003).

Credit card industry can also be traced to 1914 when department stores, oil companies, western Union and hotels start issuing cards to their customers to enable them to pay for goods and services. After about 40 years of credit card evolution, there have been increasing numbers of credit cards usage as they have become more acceptable by people as a medium of payment especially in transportation. Initially, credit cards were all paper-based payments, until in the 1990s when such cards were transformed to electronic completely. Due to the increasing number of credit cards usage, the industry has grown rapidly which lead to the introduction of a debit card too. Debit and credit cards are now used in transactions payments for all types of purchases and or services rendered all over the world (Mohamad et al. 2009).

2.3 Types of E-payment Services

Generally, there are quite a number of e-payments services that have been developed within the payment system around the globe. These include electronic cheques, e-cash, credit cards and electronic fund transfers (Ken & Will, 2002). According to Hsiao-Cheng, Kuo-Hua and Pei-Jen (2002), there are four major categories of electronic payment systems: online credit card payment, electronic cash, electronic cheques and small payments. They further stressed that each of these systems has its own advantages and disadvantages. They further stressed that each type could be assessed through these four distinct qualities viz:

Technological aspect, Economic aspect, Social aspect and Institutional and law aspects.

3. RESEARCH METHODOLOGY

To determine the current state of research on e-payment systems and their future directions, the study employs a meta-analysis technique of research. In statistics, meta-analysis refers to statistical analysis of large collection of analysed results from individual studies with the aim of integrating such findings (Glass, 1976). In other words, meta-analysis simply means analysis of analyses. As such, this study provides an extensive literature review search conducted with Google Scholar search engine in the month of May 2015 for those researches that were carried out on e-payment adoption between the years 2010-2015. The use of Google scholar is justified due to its accuracy, high performance in precision and comprehensiveness in providing measure for journal impact (Walters, 2009; Harzing & Van Der Wal 2009; Meho & Yang 2007; & Walters, 2007).

The key words used for the search were as follows: [intitle:"electronic payment" adoption], [intitle:"e-payment" adoption], [intitle:"e payment" adoption and [intitle:"epayment" adoption". Accordingly, the search produced a total number of 188 academic research papers. Out of this number, 51 of them were empirical. For the purpose of this study, these 51 empirical papers were reviewed on the criteria that they were explicitly on factors that influence e-payment adoption. In the first place, the review was to establish relevant articles that were published in different academic journals and conference proceedings across the globe pertaining to e-payment adoption and secondly, to analyse and discuss previous researches with regards to the scope-geographical location of study, methodology used, and IS models that were adapted. This is done with a view to analyse and integrate the previous researches so as to identify research gaps that will call for future research.

4. ANALYSIS OF RESULTS

As mentioned earlier, all the previous researches that were reviewed for the purpose of this study were empirical that addressed issues on e-payment adoption in different parts of the world. Our analysis is based on the onset research guiding principles. These include the scope, methodology and adapted IS models. In the first place, Table 1 below shows the analysis of all the 98 papers based on conceptual and empirical and other approach. For the purpose

of this research work, only empirical papers were considered. Though, papers categorized as others are empirical in nature, but they are mostly students' theses and dissertations and therefore excluded for analysis. The scope of the study is focusing on published research articles in journal and conference proceedings.

Table 1. Publications by empirical/conceptual approach

Approach	Number of Papers
Conceptual Papers	130
Empirical Papers	51
Others	7
Total	188

4.1 Analysis for the Scope-demographic

Researches on e-payment system adoption had been studied across the globe both in developed and the developing countries. At a glance, the analysis of these studies that was based on country location provides an understanding on the state of affairs of e-payment system adoption in different parts of the world. Many studies such as Alawiye-Adams and Afolabi, (2013), Fenuga and Kolade, (2010) Gholami, Ogun, Koh, and (2010); Ifinedo, (2012); Nwaolisa and Kasie, (2011) Ogunleye, Adewale, and Alese (2012) Ebiringa, (2010) Oyewole, El-Maude, Abba, and Onuh (2011) Briggs and Brooks, (2011), Haruna, (2012), Senyo, (2013), Antwi, Hamza, and Bavoh, (2015), Kagu, (2014), Ngereza, and Iravo, (2013), Nzaro, (2014), Kavu, Rupere, Nyambo, and Hapanyengwi, (2013) and Samui, (2014) were all conducted in African countries.

Most of these researches from the African countries focused on user acceptability of e-payment system except for Antwi et al. (2014) that investigate on its effectiveness and Nzaro, (2014) and Kavu (2013) on the role of e-payment system in financial institutions and Small and Medium Enterprises respectively. This clearly shows that e-payment system is an emerging issue in developing countries and need to be studied extensively. As such, there is need for further research on how government, financial institutions and other stakeholders in electronic payment services can influence people to use and adopt e-payment platforms in transaction payments and other payment services. Similarly, further studies could look into payment cultures, demographic and lifestyle characteristics, readiness of consumers to use electronic banking and the use Point of Sale (POS) in transactions payments (Dahlberg, Mallat, Ondrus & Zmijewska, 2007).

In addition, other studies reviewed include those that were carried out in Asian countries. These consist of Ming-Yen Teoh, Choy Chong, and Wei Chua, (2013), Harris, Guru, and Avvari (2011), Muhayiddin, Ahmed, and Ismail, (2011), Bin Muhayiddin, Elsadiq and Ismail, (2011), ; Bin Muhayiddin, Elsadiq, and Yeow, (2011), Bapat, (2012), Roy and Sinha, (2014), Dehbini, Birjandi, and Birjandi, (2015), Dhevika, and Latasri, (2011), Cheraghi, Nazari and Mahmoodi (2015), Tani, (2015), Huang, and Chen, (2011), Kim, Tao, Shin, and Kim 2010; Lin and Nguyen, (2011), Chavosh, Halimi, and Espahbodi, (2011), Hsieh, Yang, Yang, and Yang (2013), Jeon and Ha, (2010), Zahari, Ariffin, Noriza, and Zamin (2014) and Chin, and Ahmad, (2015). All the studies in these countries, contrary to developing countries in Africa, focused more on users' perception on e-payment systems platforms as well as users' satisfaction with e-payment systems services. Only few studies were found on users' acceptability. These include Roy and Sinha, (2014) and Muhayiddin et al. (2011) on customers' acceptance of electronic payment system among bank customers in India and the acceptance of electronic dinar payment system in Malaysia respectively. This indicates that e-payment systems are widely adopted and being used in Asian countries much more than in Middle East and African countries. This assertion is further supported by the 2014 World Payment Report as it revealed that combined Asian countries records 33.9 per cent as compared to that of Central Europe, Middle East and African with 23.8 per cent (World Payment Report, 2014).

Similarly, other researches that were conducted in Middle East countries among others include Keramati, Hadjiha, Taeb, and Mojir, (2012), Alinejadi, Arbab and Mehrabi, (2013), Cheraghi, Mahmoodi and Nazari, (2015), AL-Adwan, AL-Zyood and Ishfaq, (2013), Hamed, and Bether, (2012), Shiva, Ebrahimi, and Ghazizadeh (2012), Hanzae, and Alinejad, (2012), Trivedi, and Mago, (2013) and Mourad and Sherif, (2015). E-payment systems adoption studies in this part of the world are closely related to the ones in African countries on one part and similar to that of Asia on the other part. One of the outstanding characteristics of such past studies in Middle East is that they tried to evaluate the e-payment system and its effects in organizations. This can be found from the works of Shiva et al. (2012) and Alinejadi et al. (2013) in Iran, and AL-Adwan et al. (2013) in Saudi Arabia.

On the other hand, only few studies were found in the developed countries such as the U.S and Europe.

These studies include Mann, (2011), Gallardo, Olanie, Ordóñezc and Ostrom, (2015), Oti, and Kamga, (2015), Masino and NiñoZarazúa, (2014), Cheraghi, Mahmoodi, and Nazari, (2015) and Ellison, Williams and Whyley, (2012). Most of these studies dwelled much on the impact of e-payment systems in the business environment and beyond. E-payment systems technology in these countries were adopted for long and in used in almost all aspects of payment services.

Table 2. Publications by Place of Study

Continent	Number of Papers
Africa	19
Asia	20
Middle East	7
Europe and America	5
Total	51

In a nutshell, looking at Table 2 above, it shows that almost 50% of the empirical studies on e-payment adoption were carried out in African countries. Also, the number of studies in Asia is close to that of Africa. However, Europe and American countries had fewer studies which could be as a result of their advancement in technology adoption far away from the less developed countries.

4.2 Analysis for the Methodology

The methodology used in any research work is very important as it provides bedrock for research studies. In the first place, the research designs used in all the reviewed studies have something in common as most of the studies employed survey research design.

Table 3 reveals that out of the 38 empirical studies, 34 used survey research designs and the remaining 4 were exploratory. This clearly shows that much of the empirical studies conducted on e-payment use survey method. In view of this, therefore, it will be of great value for future researchers to adopt other methods with a view to fill in the methodological gap that currently exists in this area.

Table 3. Analysis of Methods

Method used	Number of Papers
Survey	47
Exploratory	4

Further analysis with regards to methodology, is the composition of respondents used in previous researches. Table 4 below presented the analysis on this particular aspect and affirms that greater part of respondents used in previous studies among users of e-payments service are 'all categories of individuals' followed by customers and bank staff.

This further indicates that most of the studies on e-payment adoption were carried out on the banking sector. In contrast, only one study had focused on public sector respondents.

Table 4. Analysis of Respondents

Information Systems Theory	Frequency
Bank customers only	5
Bank Staff only	4
Bank Staff and customers	5
Business Merchants	1
Companies staff	2
Business Merchants and retail customers	3
IT & Business Professionals	4
Top Executives	1
All categories of individuals	14
Public sector entities and Staff	1

Furthermore, with regards to the methodology, questionnaire method is the dominant instrument used in data collection from all the empirical works so far reviewed. This is evident from Table 5 as it records more than 50% of the past studies employed the use of questionnaire. However, some studies have combined the use of the questionnaire with other secondary source of data. In light of this, therefore, future research in this area would be highly recommended to go for other methods of data collection. Though, some few studies such as Ebiringa (2010), Senyo (2013), and Gallardo et al. (2015) were qualitative in nature, further qualitative studies would enhance and bring out hidden issues with regards to some matters especially with regards to customers' perception on e-payment usage.

Table 5. Analysis of Data Collection Instruments

Continent	Number of Papers
Questionnaire	30
Interview	6
Questionnaire and Interview	6
Observation	1
Others	8

4.3 Analysis of Adapted Information System (IS) Model

The use of underpinning theory in research cannot be overemphasized as its gives the groundwork on which a particular research is laid upon. Therefore, it is equally important to use theories in IS research. There are many theories that are widely used in Information Systems (IS) research which are also referred to as IS models. It is in line with this that this study tries to critically analysing the frequency of such models being used in e-payment adoption studies. The result of the analysis presented on Table 6 revealed that among those that adapted Information Systems model, the most frequently

used in determining e-payment adoption were the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT). These two models have been in use to explain usage intentions in terms of social influence and cognitive instrumental processes in technology acceptance (Davis, Bagozzi & Warshaw 1989) and user intention of using information systems and subsequent usage behaviour.

Nevertheless, Dehbini, Birjandi and Birjandi (2015) are among some few researchers that have used other models in investigating the factors that influence the adoption of e-payment system. However, from the analysis presented below, majority of past researchers have developed their own conceptual framework instead of adapting. On other hand, many others too, did neither. Therefore, it could be concluded that IS models are less frequently used in e-payment technology adoption researches. However, this might be due to lack of proper knowledge and awareness of these theories/models by some e-payment researchers in management sciences other than those in the Information Systems.

Table 6. Analysis of Adapted Theories

Information Systems Theory	Frequency
Technology Acceptance Model	9
Theory of Planned Behaviour	1
Theory of Reasoned Action	1
Unified Theory of Acceptance and Use of Technology	5
Diffusion of Innovations Theory	1
Institutional Theory	1
Expectation Confirmation Theory	2
Self-developed Models	11
No Model	20

5. CONCLUSION

As a whole, the study had critically reviewed previous existing e-payment adoption studies across the world. The paper had also highlighted and analysed past researches by giving much emphasis on three distinct elements in each study. These include the scope-geographical location of the study, theories/models used and methodology. One of the findings of this study was that most of e-

payment adoption studies were carried out in less developing countries most especially African countries. Secondly, survey method was the predominant method used by previous studies to investigate the adoption of e-payment systems across the world. Thirdly, banking sector had been in fore front runners on e-payment adoption studies as significant number of the past studies used bank customers and staff as respondents. Furthermore, the most daring instrument used for data collection in the past studies was the questionnaire method. Moreover, it was found that the most frequently used models in determining e-payment adoption in the past studies were the Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT).

Based on our findings, we would like to emphasize and recommend that future studies should use other methods other than survey so as to bring new methods with a view to observe any variations from the previous researches that might come up. Similarly, the use of different data collection instruments such as the structured interview and observation is highly recommended as they might yield better results from respondents. Also, with regards to the industry-focus of the research, a shift should be made from the banking industry to other sectors such as the retail merchants and public sector entities in order to widen the horizon of research in e-payment adoption studies. Lastly, the study also recommends the use of established Information Systems models in IS and technology related researches so that the needed factors to be examined would be properly investigated and addressed.

Finally, the limitation of this study is its limited capacity to looks on only three aspects: scope, methodology and models. Therefore, further researchers expand the scope to cover other aspects of earlier studies such as by analysing the variable used. This might give room to analyse and integrate the variables used with a view to find existing gaps for further empirical studies on e-payment adoption.

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