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OVERCOMING THE PERCEIVED BARRIERS OF E-COMMERCE TO SMALL AND MEDIUM SCALE ENTERPRISES IN GHANA – A PROPOSED MODEL

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ABSTRACT

The barriers to ecommerce adoption by Small and Medium scale Enterprises (SMEs) have been widely stated in the literature. However, there is a paucity of existing and ongoing researches and proposals to circumvent these barriers. This study therefore investigates the perceived barriers of ecommerce to Small and Medium scale Enterprises and proposes a model to overcome these barriers. Through a critical review of literature and empirical study using interviews, focus group discussions and questionnaires, to verify and validate findings from the literature; the study found security and trust, efficient payment system, high cost of ICT infrastructure, and effective product delivery systems as barriers hindering ecommerce adoption by Ghanaian SMEs. According to the National Communication Authority, the total Cellular/Mobile Voice Subscriber Base in Ghana as at September, 2012 stood at 24,884,195. This suggests that a payment medium via the telephone has a high potential patronage. The paper proposes a model to help Small and Medium scale Enterprises in Ghana overcome the perceived barriers so as to enjoy the full benefits presented by ecommerce adoption. The model proposes an e-Commerce partnership between Mobile Network Operator (MNOs), vendors (SMEs) and Courier Service Providers to render e-Commerce services to customers with payment made through cell phones (Mobile Money).

KEYWORDS

E-commerce, Overcoming, Perceived Barriers, Proposed Model, SMEs.

INTRODUCTION

The benefits derived from e-Commerce have not been fully attained by Ghanaian Small and Medium Scale Enterprises (SMEs) due to the slow adoption of e-Commerce. The adoption, according to Addo (2012) has been slow due to certain barriers including lack of e-payment penetration. According to the National Communication Authority, the total Cellular/Mobile Voice Subscriber Base in Ghana as at September, 2012 stood at 24,884,195. This suggests that a payment medium via the telephone has a high potential patronage. Mobile Network Operators (MNOs), MTN, AirTel, and Tigo, who form 72% of the total subscriber base, have introduced mobile money systems as a means of transferring money and payment for specific service bills like electricity, DSTV, Gotv, airtime, School fees and general payment for certain registered services. There are indications of high utilization for the payment of these services. Small and Medium Scale Enterprises (SMEs) constitute 90% of all businesses across the world (Hall, 2002) and forms 70% of enterprises in Ghana (Frempong, 2007). However, the SMEs are yet to adopt the strategic benefits e-commerce systems present, as research shows that many of them are yet to embrace the technology in ways that will allow them to capitalize on its potential benefits (Cragg and Mills, 2009). About 91% of the organizations in Ghana, the majority being SMEs are not involved in e-commerce (INIIT, 2002), indicating a relatively slow e-commerce adoption.

LITERATURE REVIEW

ELECTRONIC COMMERCE (E-COMMERCE)

E-commerce is the sharing of business information, exchange of goods and services, payments, the creation and maintaining of business relationships and conducting business transactions by means of telecommunications network (Zwass, 1996; Fruhling and Digman, 2000; Mahadavan, 2000 and Laudon and Laudon, 2006). E-commerce is also defined by Lee & Viehland (2008) as the process of buying, selling, transferring, or exchanging products, services, and/or information via computer networks, including the Internet. Authors in recent times have begun to define more explicitly the difference between e-commerce and e-business. E-commerce is emerging as the term used when discussing the process of transacting business over the Internet. E-business, on the other hand, involves the fundamental reengineering of the business model into an Internet based networked enterprise. The difference in the two terms is the degree to which an organization transforms its business operations and practices thorough the use of the Internet (Hackbarth & Kettinger 2000, Mehrtens et.al. 2001, Poon 2000, Poon & Swatman 1997). While the above definitions suggest all those processes should be done through telecommunication network and may restrict transactions to digital goods, we consider in this paper e-commerce to be the ordering and paying for goods and services via telecommunication network. Delivery of the goods could be made physically by the organization, picked up physically by the customer or outsourced to a third party Courier Service. Chaffey, Ellis-Chadwic, Mayer, and Johnston, (2009) categorised various model of e-Commerce into:

- ❖ (C2C) Customer to Customer where consumers directly transact with other consumers in the cyberspace. (Hoffman & Novak, 1996) identified C2C interaction as important model in Internet based transactions and suggested the need for companies to take it into consideration in their market planning effort. Their assertion is exemplified by the growth of social network site in recent times
- ❖ (B2C) Business to Customer is where customers learn about products or services through electronic publishing, and buy them using electronic cash and secure payment systems, and have them delivered electronically or through physical channel (Vaithianathan, 2010).
- ❖ (B2B) Business to Business is e-market transaction in which businesses, governments, and other organisations depend on computer-to-computer communications as a fast, an economical, and a dependable way to conduct business transactions (Vaithianathan, 2010).
- ❖ (C2B) Customer to Business is type of online transactions where consumers initiate trading with companies.
- ❖ (C2G) Customer to Government is type of online interaction where feedback is given to government through pressure group or individual sites.
- ❖ (B2G) Business to Government is type of online interaction where feedback from businesses is given to government and non-government organisations
- ❖ (G2C) Government to Citizen is type of online interaction through which government offer national transactions such as local government services, national government information, and tax information.

BARRIERS TO E-COMMERCE

E-commerce comes with a number of benefits including competitive advantage, easy integration of back office activities, allowing suppliers and buyers to interact efficiently, and reaching out to larger markets (Lomerson et al, 2004) and makes marketing flexible and accessible for 24 hours resulted in increased business hours across the world (Hagel and Lanseng, 1994).

In the face of these benefits are a number of barriers that hinder SMEs from adopting e-commerce. Kapurubandara and Lawson (2006) categorise the barriers as either external or internal. These barriers include trust issues where customers do not trust electronic transactions especially on the web. Other barriers include a suitable e-payment medium for customers to pay for transactions online, logistics for delivery of indirect e-commerce products and high cost of investment to the SMEs (Addo, 2012; Amoako, 2012; Kapurubandara and Lawson, 2006; Frempong, 2007, Boateng et. al, 2011). These barriers have been difficult to overcome. Internal barriers like characteristics of business owner have been overcome or reduced through continuous education. Chapman et al., 2000; Love et al., 2001; Tuunainen, 1998 also reported that weak financial position of SMEs and the resistance to invest in complex Information System is seen as major barriers in information systems adoption. However findings by Ghobakhloo et al., (2011) found that e-Commerce adoption cost is not perceived to be a major barrier by 235 SMEs surveyed in Iran. Furthermore, e-commerce security issue is becoming a major issue in Ghana, more especially with the advent of 'Sakawa' cyber fraud activities among some Ghanaian youth. In view of this both SMEs and their customers see the Internet as insecure medium to transact business and prefer to undertake all transactions offline in order to avoid risk of falling victim to Internet fraud. Khalifa et al. (1999) reiterated this point by stating that perceived or real risk, such as Internet security, authentication and legal issues were some barriers to adoption of e-Commerce.

SMALL AND MEDIUM SCALE ENTERPRISES (SMEs)

Small and Medium sized Enterprises (SMEs) has been defined differently by various researchers. According to Van der Wijst (1989) small and medium businesses as privately held firms with 1 – 9 and 10 – 99 people employed. Jordan et al (1998) define SMEs as firms with fewer than 100 employees and less than €15 million turnover. Steel and Webster (1991), and Osei et. al., (1993) however used an employment cut-off point of 30 employees. Osei et. al., (1993) classified SMEs into three categories namely; micro - employing less than 6 people; very small - employing 6-9 people; Small - between 10 and 29 employees. The Regional Project on Enterprise Development Ghana on the other hand argued that small enterprises have between 5 – 29 employees whereas medium enterprises have 30 – 99 employees.

Small and Medium sized Enterprises (SMEs) do play a major and important role in today's world economy, and they are recognized as one of the main contributors to economic, development and employment growth. On the other hand, the revolution in Information technology (IT) and communications changed the way people conduct business today. In recent years, increasing numbers of businesses have been using the Internet and other electronic media in conducting their marketing efforts, giving the chance for Electronic business which is a new phenomenon to grow in a very dramatic and dynamic way. Adopting E-business by Small and Medium enterprises can change both the shape and nature of its business all over the world. Because the increase usage of the Internet and other Electronic business tools (i.e.: E-mail, Intranets, Extranets and Mobile phones) in electronic transactions might create not only a lot of opportunity for small business enterprises but also can eliminate a lot of threats. From this perspective, it is noticed that the Internet, electronic media tools are playing a vital and essential role in conducting marketing activities within business enterprises regardless of its type or size (Nelson, 2000). There is a growing recognition of the role of small and medium enterprises (SMEs) in economic development. They are often described as the engine of growth and prolific job creators. Even in the developed industrial economies, it is the SME which has the largest employer of workers rather than the multinationals (Mullineux, 1997). Interest in the role of SMEs in the development process continues to be in the forefront of policy debates in most countries. Governments at all levels have undertaken initiatives to promote the growth of SMEs (Feeney and Riding, 1997). SMEs represent over 90% of private business and contribute to more than 50% of employment and of GDP in most African countries (UNIDO, 1999). Small enterprises in Ghana are said to be a characteristic feature of the production landscape and have been noted to provide about 85% of manufacturing employment of Ghana (Steel and Webster, 1991; Aryeetey, 2001).

IMPORTANCE OF THE STUDY

The theoretical contribution of this paper is to explain the 'Whys' and 'Hows' of ecommerce in Ghanaian Small and Medium Scale Enterprises. The study investigates 'why' Ghanaian Small and Medium sized Enterprises have fail to adopt ecommerce despite the numerous benefits to be derived; and eventually proposes a model on 'how' these barriers hindering ecommerce adoption can be circumvented. While there have been several studies on the barriers of ecommerce to Small and Medium sized in developing countries, none of the existing studies strive to propose a model for overcoming these barriers, hence this study bridges the existing research gap in the area. It is imperative to note that, the researchers at the time of this research were unaware of any studies that propose a model to overcome the perceived barriers of ecommerce to SMEs in developing countries. Therefore the results of this study can provide valuable insights for both academia and practitioners in the e-business area.

STATEMENT OF THE PROBLEM

Notwithstanding the numerous studies on electronic commerce the world over, this paper attempts to empirically answer the following questions (1) what are the perceived barriers to ecommerce adoption by Ghanaian SMEs; and (2) how can SMEs overcome the perceived barriers to ecommerce adoption?

OBJECTIVES

The objective of this paper is to empirically investigate the perceived barriers of ecommerce adoption and to propose a model to help SMEs in Ghana overcome the perceived barriers so as to enjoy the full benefits presented by ecommerce adoption. The paper also proposes an e-Commerce partnership between Mobile Network Operator (MNOs), vendors (SMEs) and Courier Service Providers to render e-Commerce services to customers with payment made through mobile money.

METHODOLOGY

The study started with a review of literature to ascertain the barriers to existing e-commerce models. This allowed the author to identify primary studies that can be used to investigate a specific research question (Khan et. al. 2010) Through the critical literature review, ten articles that provide answers to the question: what are the barriers to e-commerce adoption by SMEs?, were selected. These ten articles were identified through a computer search of online databases of published works and conference proceedings in the e-business area. The articles were searched by the title based on the following criteria:

- ✓ E-commerce (AND) Adoption
- ✓ E-commerce (AND) Barriers
- ✓ SMEs (AND) E-commerce

The results of the literature reviewed are summarized in table 1 below

TABLE 1: E-COMMERCE ADOPTION BARRIERS

AUTHOR	COST OF ICT INFRASTRUCTURE	TRUST AND SECURITY	EFFICIENT PAYMENT SYSTEM	EFFICIENT DELIVERY SYSTEM
Kapurubandara & Lawson (2006)	*	*	*	*
Addo (2012)	*	*		
Amoako (2012)	*	*	*	*
Frempong (2007)	*	*		
Boateng et. al, (2011)	*	*	*	
Van Toorn et. al. (2006)	*	*	*	*
Darch and Lucas (2002)	*	*		
Idris (2012)	*	*		
Paul Jones et. al. (2003)	*	*		
Abdel Nasser (2012)	*	*	*	

Table 1 above shows the result of the literature review. Published studies from the year 2002 to 2012 (10 years) were considered to ensure that current study is firmly rooted and supported by literature. It is imperative to note that the most eminent barriers that persist in most of the existing empirical studies are selected for consideration in this study.

In order to verify and validate the finding from the literature, Managers of ten (10) selected SMEs were brought together in a focus group to discuss the perceived barriers and the way forward. The discussion focused on the high cost of ICT infrastructure identified in the literature from previous studies as a barrier to ecommerce adoption by Ghanaian SMEs.

A survey using self-administered questionnaire was also used to confirm the issue of security and trust, lack of efficient electronic payment and effective delivery system identified through literature as challenges to the adoption of ecommerce in developing countries. The questionnaire was pretested on selected customer relation officers and marketing executives for their comments and suggestions, and after developed the final questionnaire. The questionnaire was developed on a 1 – 5 likert scale. Two Hundred (200) questionnaires were randomly distributed to customers from the selected SMEs in the manufacturing, retail, pharmaceutical, agribusiness and service industries, across the major cities in Ghana: Accra, Tema, Kumasi, and Tarkorade. After a follow up, 150 representing 75% of the administered questionnaires were retrieved. However, 10 incomplete questionnaires were excluded from the analysis. After excluding incomplete and invalid responses, the study ended up with 138 valid and usable questionnaires, representing 69% response rate, which is on the high side to confirm a perception in this research.

Managers of Mobile Network Operators and a popular Courier Service, EMS operated by Ghana post were also interviewed with the goal to understand their business processes and the prospects of the proposed model. Questions for the five face-to-face interviews were formulated from the identified barriers (efficient payment system and delivery system). Personal observations were also conducted to validate the data collected through the interviews. The data collected was used to identify all relevant (existing and abstract) partners. The study ends with a rich picture diagram and an activity diagram to depict the interaction among the various actors.

FINDINGS/RESULTS AND DISCUSSIONS

The study sets out to investigate the perceived barriers to ecommerce adoption in Ghanaian SMEs in order to propose a model to overcome these perceived barriers.

From the literature reviewed and empirical study conducted, cost of ICT Infrastructure, Security and Trust, Efficient Payment System and Effective delivery System were identified as the perceived barriers. The result of the empirical study is shown in Table 2.

TABLE 2: MEANS AND STANDARD DEVIATIONS OF PERCEIVED BARRIERS (N=138)

No	Perceived Barrier	Mean	standard deviation
1	Doing business online (internet) is not secured therefore I do not trust such systems	3.97	0.80
2	I consider lack of electronic payment medium as a reason why I don't do business online	3.77	0.76
3	I do not do business online because of lack of effective delivery	3.75	0.79

(5=strongly agree, 4=agree, 3=neutral, 2=disagree, 1=strongly disagree)

After a careful analysis of existing e-business models, a new model which ensures integration between Mobile Network Operators (MNOs) and SMEs was proposed as a way to overcome the perceived barriers. The proposed model identified the following, shown in fig 1 below, as relevant actors; Vendor (SMEs), Broker (E-commerce website), Mobile Network Operators (MNOs), Courier Service, Customer and Certificate Authority (CA). These actors are all present in the existing e-business model with the exception of the Broker and Certificate Authority, which we have found relevant due to problems identified with the existing models; issue of cost and trust.

CERTIFICATE AUTHORITY (PERCEIVED BARRIER – SECURITY AND TRUST)

Data collected from customers with questionnaires showed the results indicated in Table 2. The results indicate that customers do not trust the existing mobile payment systems in Ghana and feel they are less secured. This was realized after customers indicated on a 1 to 5 likert scale the extent to which they trust doing business online. Existing empirical studies (Addo, 2012; Amoako, 2012; Kapurubandara and Lawson, 2006; Frempong, 2007; Boateng et. al, 2011) also suggest the issue of security and trust on the part of consumers as a major challenge to the adoption of mobile payment systems and e-commerce in developing countries. These challenges we believe exist due to the non existence of a trusted third party in the existing system. For instance, in the developed countries (US for example) where electronic payments utilization is high, trusted authorities such as VeriSign serves as a trusted third-party between users of the electronic payment systems and the merchants. In view of this, we strongly believe this issue of security and trust on the part of consumers can be circumvented with the introduction of a **Certificate Authority (CA)** which acts as a trusted third-party in the proposed model shown in fig 1.

A Certificate Authority (CA) in the propose model therefore is a registered company that serves as a trusted authority in the proposed system to issue and manage security credentials of both brokers and mobile money providers (MNO). By the Ghana’s Electronic Transaction Act, 2008 (Act 772), and the National IT Agency Act, 2008 (Act 771), the National IT Agency shall facilitate the establishment of a Certifying Authority, which shall issue licences for encryption and authentication services over a website. Thus all CAs must register with the certifying authority and be issued a license to operate. The CA will issue a public key certificate which states that the CA attests that the public key contained in the certificate belongs to the person, organization, server, or other entity noted in the certificate. A CA’s obligation in this model is to verify an applicant’s credentials, so that users (relying parties) can trust the information in the CA’s certificates. The usual idea is that if the user trusts the CA and can verify the CA’s signature, then they can also verify that a certain public key does indeed belong to whoever is identified in the certificate. If the CA can be subverted, then the security of the system breaks down. For example, suppose an attacker, Mark, manages to get a certificate authority to issue a false certificate tying Franka to the wrong public key, which corresponding private key is known to Mark. If Eric subsequently obtains and uses the public key in this certificate, the security of his communications could be compromised by Mark — for example, his messages could be decrypted, or he could be tricked into accepting forged signatures. A certificate authority therefore helps to curb such eventualities in the model.

THE BROKER (PERCEIVED BARRIER – HIGH COST OF ICT INFRASTRUCTURE)

Interviews conducted with managers of selected Small and Medium Enterprises (SMEs) in Ghana professed high cost of ICT Infrastructure as a major barrier to electronic commerce and its associated electronic payment system. Setup cost with respect to building, and IT infrastructure and operational cost also include cost of employing, training and maintaining the requisite skilled IT personnel. Findings from existing empirical studies also corroborate this finding. Frempong (2007) suggested cost of ICT investment as a major factor underpinning its adoption by SMEs in Ghana. Rajon et. al., 2011 also stated cost (setup) as reason for the selection of free and open source e-commerce software by SMEs in under developed countries. Addo, 2012; Mokaya, 2012, also identified high cost of implementation as a reason for the non-adoption of e-commerce by SMEs in Ghana and Kenya respectively. We therefore propose the introduction of a **Broker** in the proposed model to mitigate this problem and encourage more SMEs to do business online. The broker will be responsible for the setting up and maintaining the needed e-commerce platform which all SMEs will subscribe to, hence setup and operational cost will be borne by the broker and not the SMEs.

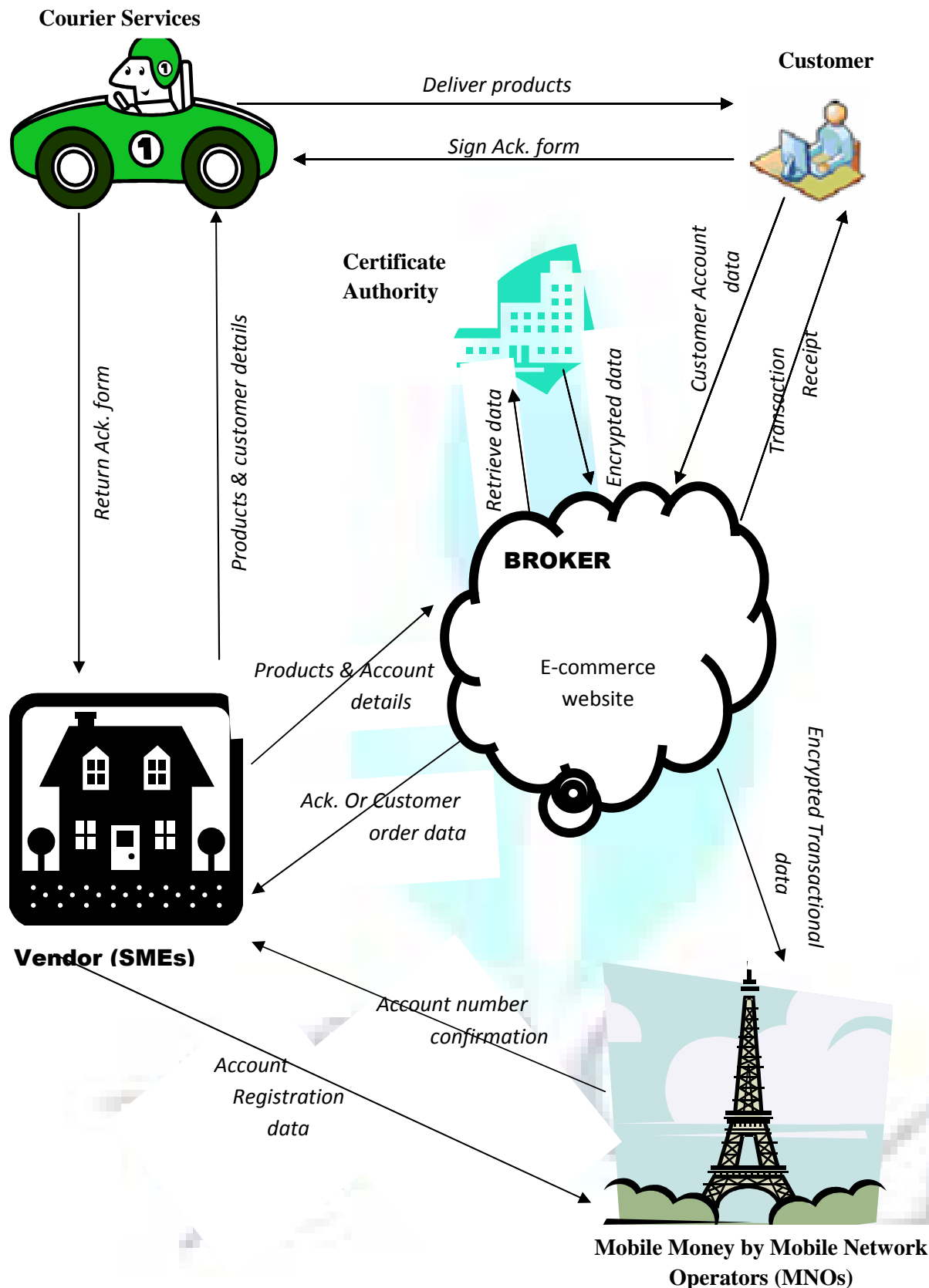
A broker in this model is a conceptual actor which could be a company to provide vendors with the necessary platform on which commerce can be undertaken. Brokers or intermediaries create markets by bringing buyers and sellers together and facilitating transactions between them. The broker's role in this model is like the traditional brick-and-mortar situation where a person or a company builds a shopping mall or complex and lease it out to various business owners. The broker provides a website with vendor's (SMEs) product information and online ordering mechanisms. Users select the products they want to buy and place an order. The product price can be fixed or negotiable. Vendors who want their products and services to appear on a broker's website must do so through periodical subscription. After an agreement is reached and contracts are signed, the vendor supplies to the broker the list of products and services to be displayed on the website together with their mobile money payment account supplied by a Mobile Money Payment Service Provider.

MOBILE MONEY PAYMENT SYSTEM (PERCEIVED BARRIER – EFFICIENT PAYMENT SYSTEM)

Several payment systems exist for the payment of goods and services online, from direct payment upon delivery to the use of credit and debit cards and e-banking and mobile payments (PwC, 2003; Krueger, 2004). The credit and debit cards forms of payments are less pronounced in Africa and in Ghana. Mobile payment (m-payment) involves the payment of goods and services using a mobile device such as PDA and more commonly, a mobile phone (Mensah, Laar and Alirah, 2012). The most common in Ghana is the mobile money. About 80% of the Ghanaian population is unbanked (PwC, 2012) and the initial implementation of mobile money is to enable the unbanked perform money transfers. Drawing on the success of the M-PESA (Sultana, 2011), mobile money seems to be the future of e-payment systems in Ghana and three leading mobile telecom operators MTN, airtel and Tigo forming about 72% of the market share have rolled out mobile money payment system. The issue of trust on the part of consumers, however, continues to be a challenge in the adoption of mobile money in Ghana (Tobbin and Kuwornu, 2011). Mensah et al (2012) developed a proposed model for the improvement of m-payment systems in Ghana. Their model suggests a way of inter-payment among mobile money operators and provides a legal framework for such a process. The empirical study conducted found mobile money payment as efficient and reliable payment system from both customers and operators perspectives. Customers emphasized the ease of use and comfort brought by its introduction for funds transfer and for the payment of bills for certain essential services.

In view above findings, we believe the mobile money payment system can be used as a way to overcome the problem of efficient payment systems in the e-commerce model. A Mobile Network Operator (MNO) in this model (fig 1) is a network operator with nationwide coverage that provides electronic cash facility (mobile money) to its customers for performing various transactions nationwide. Examples include Tigo cash, Airtel money, and Mtn mobile money. An MNO should allow the transfer of cash electronically from one customer to another and should also enable online payment through an intermediary (broker). The MNO in the proposed model should have a web portal through which customers can make transfers among themselves. However, in this model the web portal through which data (account details, transactional data) will be transmitted shall be secured by a Certificate Authority (CA) contracted by a broker to ensure confidentiality, privacy and trust in the system. An MNO may register vendors (SMEs) who want to do business online and after provide them with account numbers which will be used by customers for making payments, and a personal identification numbers (PIN) known only to the vendors, which the vendors may use to access their account. The Vendor (SME) then makes the name of MNO and the account numbers available to the Broker, who would use such account numbers to direct all payments to the particular SME.

FIG. 1: RICH PICTURE DIAGRAM OF THE E-COMMERCE NETWORK MODEL FOR AN SME



COURIER SERVICES (PERCEIVED BARRIER – EFFECTIVE DELIVERY SYSTEM)

The lack of effective product delivery system in the current ecommerce model has been one of the major factors underpinning its adoption by SMEs in Ghana as confirmed in our findings in Table 1. Separate studies conducted by Kapurubandara and Lawson (2006), Amoako (2012) and Van Toon et. al. (2006) all corroborates this finding. However, during our interviews with selected SMEs, it was realized a formal agreement or partnership between the SMEs and Couriers Services in Ghana could help overcome this barrier to the latter. Sentiments expressed by owners of selected SMEs are captured in the following quotation “if we are able to partner the courier services, we can reach a wider coverage of customers across Ghana, since they have already established the trust with customers”. Managers of some Courier Services also expressed that such partnership would be beneficial since it would increase their profit margins. With these

sentiments expressed by both sides there are no doubts that a proposal for such partnership would be welcomed by both parties, hence the introduction of a courier service in the proposed ecommerce model.

The courier service is a company which is contracted by a vendor to dispatch goods to customers at their various locations. A courier service in this model must be a registered company with a reputation to deliver products on time. The courier service is an important actor/player in this model since the effectiveness of the model is also dependent on the ability to deliver products on time to customers irrespective of their location. Established courier services in Ghana such as DHL, Fedex, EMS etc could be used. The courier service may receive a phone call from the vendor during which the details of ordered products and customer information (names and addresses) including delivery dates shall be made known. The courier service then sends an agent who will pick up products from vendors' location for onward delivery to customer. The courier service then sends acknowledgement of receipt signed by customers to vendors for verification and also returns all undelivered products to the vendor.

VENDOR (SMEs)

A vendor in this model refers to any Small and Medium Scale Enterprise (SME) which has subscribed to a broker to undertake commerce on a designated platform. A vendor may be a shop, a company or an individual offering some products for sale to the general public (specifically within the catchments areas or scope of the mobile money merchants). A vendor is a wholesaler or retailer of goods or services. A vendor with the help of a broker (one who provides the platform for commerce) puts out some products on an e-commerce site for the general public. A vendor however must hold accounts with all mobile money merchants (MNO) specified by the broker as the payment mechanisms, to be able to accept payments from all customers. The vendor makes his money the same way as traditional "brick-and-mortar" shops: through the profit margin in the product price

CUSTOMER

A customer in this model may be a person, group of persons, institution or company which holds an account with a mobile money merchant and is willing to purchase a product or service being put out for sale from a vendor through an intermediary (broker). In other words, a customer is a person or group of persons with the desire to make online purchases. Every customer in this model must have a mobile money account and a known residential or work address for the delivery of ordered products. A customer visits an online shop manned by a broker and browses through the list of products and services on display. The customer then selects products or services into a shopping cart. At the point of checkout the customer selects his mobile money merchant and initiates payment. If the process succeeds the customer receives an electronic receipt which details the list of products or services purchased and their quantities, total amount paid and arrival date.

BUSINESS PROCESSES OF THE PROPOSED MODEL (ACTIVITY DIAGRAMS)

The Activity diagrams shown in fig 2 & 3 depict the sequential business processes and concurrencies in the proposed model. In the diagrams, Activities are depicted by rounded rectangles, transitions between activities are shown as arrows, the bold bars show how one thread of control "forks" into multiple threads or that multiple threads "join" together to form one thread. Actors in model are shown as swim lanes with each swim lane representing a single actor and its activities. Decisions are represented with diamonds with a description on the right side in a square bracket.

FIG. 2: ACTIVITY DIAGRAM OF CUSTOMER ORDER

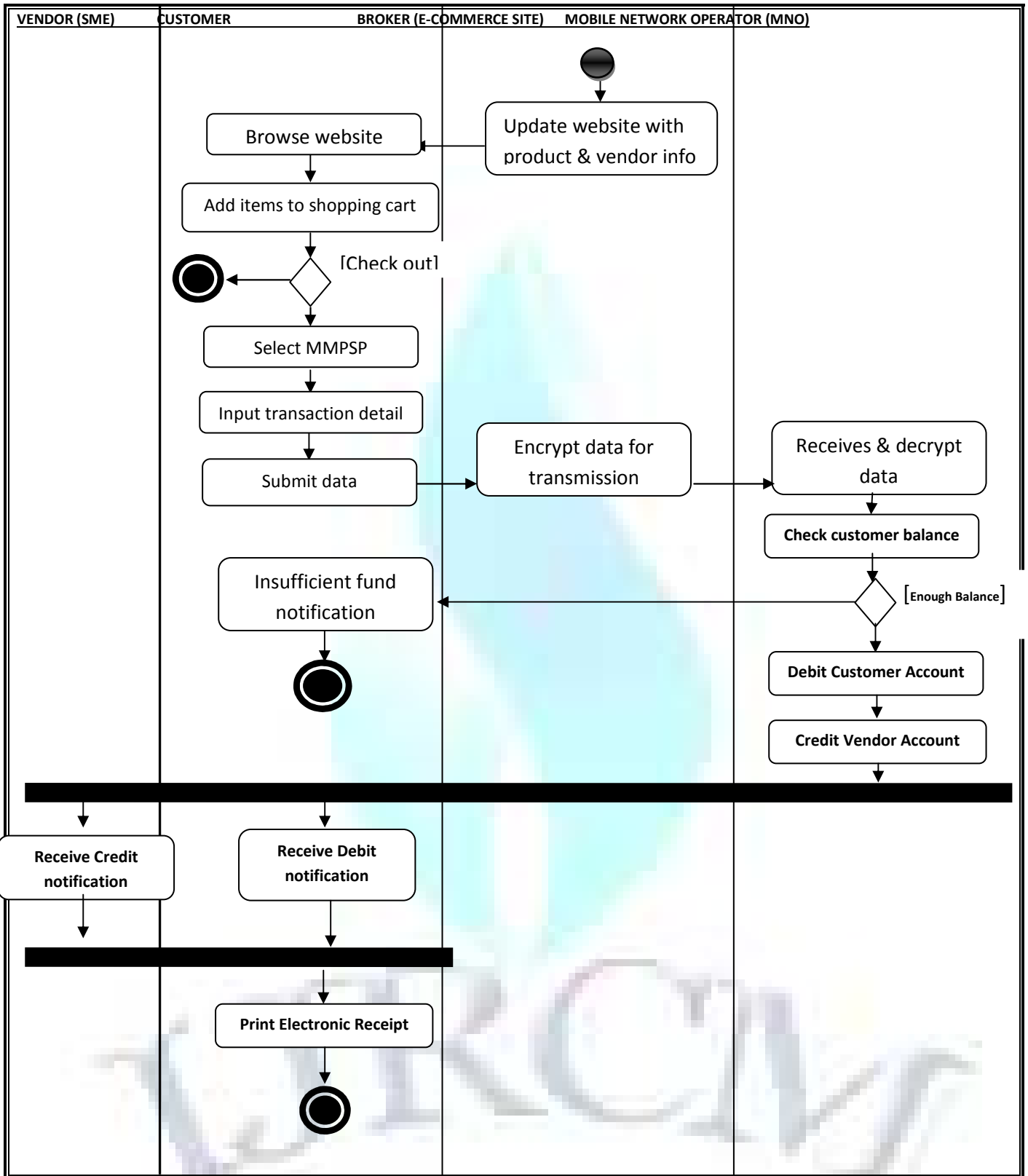
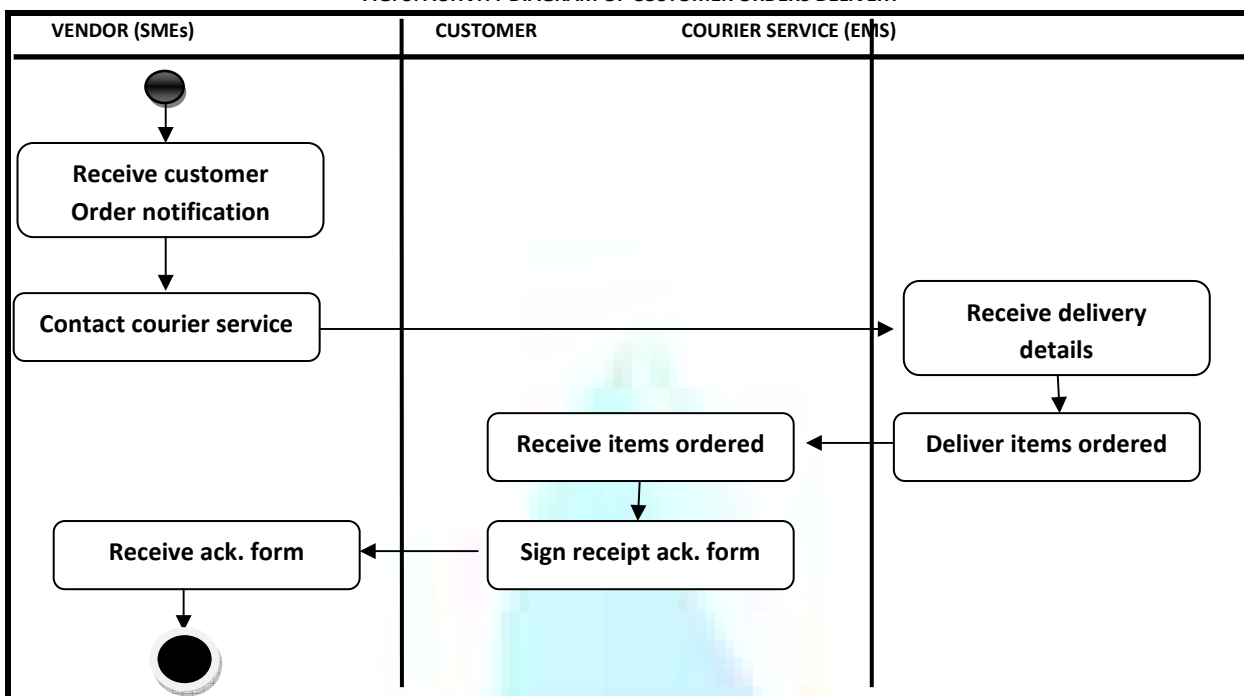


FIG. 3: ACTIVITY DIAGRAM OF CUSTOMER ORDERS DELIVERY



The Activity diagram in Fig 3 shows the sequential business proposes that transpires between different actors in the model (vendor, customer, broker and mmm) when a customer initiates an order. It is however imperative to note that, for the purpose of simplification, the activities of the Certificate Authority as depicted in the rich picture are left out. The Certificate Authority (CA) after the issuance of certificate to the vendor and MMM, when a customer initiates an order process, the CA is responsible for ensuring that data to be transmitted is properly encrypted with the certified keys of the recipient and ensures appropriate decryption of data when data reaches recipients. This helps to ensure secure transmission of financial and personal data in electronic form in the proposed model. Fig 2 on the other hand shows the sequential processes undertaken by the vendor, and courier service in ensuring the customer receives the items ordered.

CONCLUSIONS AND RECOMMENDATIONS

The theoretical contribution of this paper is to explain the ‘Whys’ and ‘Hows’ of ecommerce in Ghanaian Small and Medium Scale Enterprises. The above discussions indicate that an e-commerce network model could helps to overcome barriers like lack of e-payment system, high cost ICT Infrastructure, lack of efficient delivery system and the issue of security and mistrust of electronic transactions by customers. This model proposes mobile money payment system introduced by the Mobiles Network Operators (MNOs) as a way to overcome the problem of efficient payment system, Certificate Authority who will provide digital certificates for encryption and decryption as a way of overcoming the issue of security and trust in the ecommerce circles, a courier service to deliver effective transport system and a broker who will provide the ICT infrastructure for ecommerce to circumvent the problem of high cost of ICT infrastructure underpinning the adoption of ecommerce by Ghanaian SMEs.

LIMITATION OF THE STUDY

This study was conducted with the assumption that the existing mobile money payment systems will have a minimal down time, since the proposed model is dependent on the availability of the mobile money payment systems.

The proposed model is also limited by the lack of inter-operability between the Mobile Money Payment Service Providers. This prevents customers from one Mobile Money Payment Service Provider from doing business with others. For instance, a customer who holds an MTN mobile money account can only buy goods and services from vendors with MTN mobile money account, but not from those with AirTel money or Togo cash.

SCOPE FOR FURTHER RESEARCH

Further studies could be undertaken to develop a model for ensuring inter-operability between the Mobile Money Payment Service Providers, which would allow an in-depth analysis into the business requirements for ensuring such integration. A cost and benefit analysis could also be carried out. The e3-value model could also be used as tool for determining the actual economic value created by the model.

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