## **INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE, IT & MANAGEMENT**



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**OBJECTIVES** 

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## AN E-3 VALUE MODEL FOR ASSESSING e-COMMERCE PARTNERSHIP PROFITABILITY TO SMEs IN GHANA

#### AMANKWA, ERIC LECTURER PRESBYTERIAN UNIVERSITY COLLEGE GHANA

## KEVOR MARK-OLIVER LECTURER PRESBYTERIAN UNIVERSITY COLLEGE GHANA

#### **ABSTRACT**

E-Commerce adoption in Ghana has been slow due to certain perceived barriers. In overcoming the perceived barriers, a model has been developed that consists of a value web of a Small and Medium Enterprise, Mobile Network Operator, a Courier Service Provider, a Certificate Authority and a Broker. The survivability of such a partnership depends on whether the participating actors generate profits. This paper proposes an e3-value model that can be used to assess the profitability of the e-Commerce partnership. Through interviews of managers of the various actors and a description of the abstract actors from literature, the value activities performed by the various participating actors and the value exchanges between them were identified. An e3-value model that could be used to assess the profitability of the partnership was developed. A case study of a bookshop, which is a typical Small and Medium scale Enterprise, was used to confirm that, participating actors in the model are able to make profit.

#### **KEYWORDS**

e-commerce, e3-value model, assessing profitability, partnership, SME, Ghana,

#### INTRODUCTION

overnments at all levels have undertaken initiatives to promote the growth of Small and Medium Scale Enterprises (SMEs) (Feeney and Riding, 1997).

SMEs represent over 90% of private businesses and contribute to more than 50% of employment and 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 et al, 1994) and forms 70% of enterprises in Ghana (Frempong, 2007).

According to Addo (2012), e-Commerce adoption by SMEs in Ghana has been slow due to certain perceived barriers. These perceived barriers such as efficient e-payment penetration, trust, high ICT cost, effective delivery system has been identified (Addo, 2012; Amoako, 2012; Kapurubandara and Lawson, 2006; Frempong, 2007, Boateng et. al, 2011) and confirmed in Amankwa and Kevor(2013).

In overcoming the barriers, Amankwa and Kevor (2013) proposes an e-Commerce partnership consisting of a Vendor, a Mobile Network Operator (MNO), a Certificate Authority (CA), a Courier Service Provider(CSP) and a Broker. The survival of each of the actors in the partnership, and by extension, the model depends on if they make profit.

The e3-value is a requirement engineering methodology to model an e-Commerce idea from an economic perspective with the aim to understand such an idea thoroughly and to evaluate it for potential profitability (Akkermans and Gordijn, 2003). Complex ideas can be clearly represented using the e3-value methodology, which is capable of expressing and analyzing several general mechanisms that are important in e-business, including revenue streams, value objects, customer ownership, price setting, alternative actors, and partnership issues.

#### LITERATURE REVIEW

#### SMEs IN GHANA

SMEs form about 70% of all enterprises in Ghana (Frimpong, 2007) and contribute to about 40% of the country's Gross National Income (Ghana Government, 2003). These SMEs are engaged in manufacturing, retailing, agro processing, etc. SMEs in Ghana are generally characterized by low numbers of employee size (Osei et. al., 1993). The most efficient business processes must therefore be adopted by SMEs to enable them survive. This include the adoption of information and communication technologies.

#### ELECTRONIC COMMERCE (e-COMMERCE)

e-Commerce has been defined differently by various researchers. For example, one group of researchers define e-commerce as 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 et al (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). Whiles 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 (Amankwa and Kevor, 2013). 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.

A number of research on e-Commerce adoption by SMEs in developing countries have focused on the extent of adoption (Addo 2012, Amoako 2012, Faisal 2012), potential benefits (Hasan and Tibbits 2000, Kuan and Chau 2001, Straub et. al. 2002, Bynoe 2002) and perceived barriers (Addo, 2012; Amoako, 2012; Kapurubandara and Lawson, 2006; Frempong, 2007, Boateng et. al, 2011)

Amankwa and Kevor (2013) propose a model that could be implemented to overcome the identified barriers to e-commerce adoption by SMEs in Ghana.

#### AMANKWA AND KEVOR EXTENDED E-COMMERCE MODEL

In an attempt to overcome the perceived barriers to e-Commerce adoption by SMEs in Ghana, Amankwa and Kevor (2013) proposes a network model that consists of:

- A vendor, which is typically an SME that has some products or service to offer for sale.
- A customer who is willing to pay for a product or service offered by a vendor
- A Mobile Network Operator that offers mobile money payment services
- A Courier Service Provider that efficiently delivers physical products from vendors to customers.
- A Certificate Authority that acts as a trusted third party to provide security credentials to brokers and or mobile network operators

A broker that provides an electronic market place for vendors to advertise and sell their products to customers.

The partnership is shown in fig 1 below

In other for the partners in the model to survive, each of the service providers must be seen to be making profit and the customer must be satisfied with the product and service provided. How can one then assess the profitability of the model?

#### THE e3-VALUE METHODOLOGY

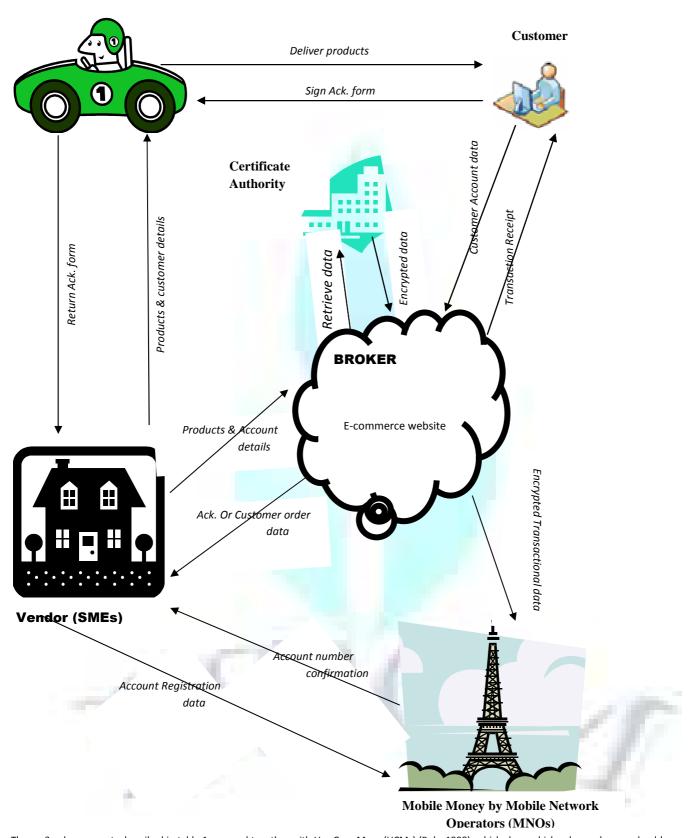
According to Gordijn and Akkermans (2003), e3-Value is an ontology-based methodology for modelling and designing business models for business networks. Unlike other models, the e3-value model looks at how objects of economic value is created, exchanged and consumed in a multi-actor network. The model canbe used to assess the profitability of actors in an e-Commerce partnership model. Some concepts in the e3-value methodology are described in table 1.

**TABLE 1: e3-VALUE CONCEPTS** 

Concept	Description	Graphical Notation
Actor	These are parties engaged in value exchanges. An enterprise actor is interested in profitability whiles a consumer actor is interested in maximising its economic utility	
Value Activity	These are activities performed by actors, which can give profits to an actor or increase its economic utility.	
Value Objects	These are material, such as physical goods, products or money, or non-material (e.g. services, capabilities or experience) that is beneficial to an actor in the network. value objects are exchanged among actors.	money, book, transport, etc
Value Interfaces	These are used by actors to signal a request or to provide value objects. A typical value interface will consist of two or more ports for giving and receiving value objects	
Value Ports	value ports serve as connection point between two actors. It enables an actor to be concerned with the value object they receive without being concerned with the value activity that produced it.	
Value Exchange	These are used to connect value ports to each other. Typically, every value object given must be exchanged with another value object. This is economic reciprocity	book money
Market Segment	A market segment consists of one or more actors who provide or receive the same value objects. They place the same economic value on the objects they exchange.	



FIG 1: RICH PICTURE DIAGRAM OF THE e-COMMERCE NETWORK MODEL FOR AN SME (Amankwa and Kevor, 2013)



These e3-value concepts described in table 1 are used together with Use Case Maps (UCMs) (Buhr 1998), which show which value exchanges should occur as a result of a consumer need (which we call a start stimulus), or as a result of other value exchanges. These are also summarised in table 2.

TABLE 2: USE CASE MAPS				
Concept	Description	Graphical Notation		
Scenario Path	A scenario path consists of one or more scenario segment, related by connection elements, start and stop stimuli. A path indicates via which value interfaces objects of value must be exchanged, as a result of a start stimulus, or as result of exchanges via other value interfaces.	is used to connect scenario segments		
Stimulus	A scenario path starts with a <b>start stimulus</b> , which represents a consumer need (in the model, the need for a specific good). The last segment(s) of a scenario path is connected to a <b>stop stimulus</b> . A stop stimulus indicates that the scenario path ends.	start stimulus  Stop stimulus		
Scenario Segment	A scenario path has one or more segments. Segments are used to relate value interfaces with each other (e.g. via connection elements) to show that an exchange on one value interface causes an exchange on another value interface.			
Connection Element	Connections are used to relate individual scenario segments. An AND fork splits a scenario path into two or more sub paths, while the AND join collapses sub paths into a single path. An OR fork models a continuation of the scenario path into one direction that is to be chosen from a number of alternatives. The OR join merges two or more paths into one path. Finally, a value interface itself is seen as a connection element, so it is for instance possible to connect two value interfaces by a scenario segment	AND FORK/JOIN  OR FORK/JOIN		

#### **IMPORTANCE OF THE STUDY**

It is not enough to have an e-Commerce idea. It is important to have participating stakeholders buy into the idea. This can be done if there is evidence of its profitability. The e3-value methodology has been used to exploit several e-commerce ideas for their profitability and this paper is no exception. This research also looks at integrating a secondary value object in a form of mobile money which has not been fully modelled in the original e3-value methodology.

#### STATEMENT OF PROBLEM

There are attempts by researchers to find ways of overcoming barriers to e-Commerce adoption by SMEs in developing countries. Amankwa and Kevor (2013) propose an e-Commerce partnership that overcomes the perceived barriers of SMEs in Ghana. The question now is how to determine whether such partnership is profitable to the participating actors. This paper answers the questions:

- 1. What are the value activities of the e-Commerce partners in Ghana?
- 2. How will the profitability of such a partnership be assessed?
- 3. Are participating actors able to make profit?

#### **OBJECTIVES**

The objective of this paper is to identify the value activities performed by participating actors in an e-Commerce partnership for SMEs in Ghana as proposed in Amankwa and Kevor (2013) and to develop an e-3 value model that can be used to assess the profitability of each participating actor.

#### **METHODOLOGY**

Using the proposed model in Amankwa and Kevor (2013), the managers of the participating actors were interviewed to elicit for the various value activities the actors perform. The various value exchanges were also identified. The e3-value editor was used to develop a value model that could be used to assess the profitability of the various actors. A case study of a bookshop is selected as a typical SME and based on historical and recent market data, a profitability sheet was then generated for each participating actor.

#### FINDINGS/RESULTS AND DISCUSSIONS

From the Amankwa and Kevor (2013) e-Commerce model and interviews conducted with various stakeholders, the following actors, their value activities, value objects and exchanges were identified.

**The Customer:** A customer is identified as an actor. It consumes goods as value objects offered by other actors in the model. The customer also pays for the goods using mobile money. The customer receives the goods directly through a courier service provider. A customer is modelled as a market segment since there could be more than one instance.

**The Vendor:** The vendor is the SME who has some goods to offer. The vendor pays registration fee to the broker in exchange of a market space on its e-Commerce website. The Vendor is also modelled as a market segment since there are a number of SMEs who may register with the broker. The vendor also pays the courier service provider in exchange of transport service.

**The Broker:** The broker offers market space on its e-Commerce website to vendors in exchange of registration fees paid by those Vendors. In order to be seen as a trusted website, the broker pays license fees to a certificate authority in exchange of a license. The broker is modelled as an actor for this particular scenario. Over time, there could be more brokers.

The Certificate Authority (CA): The certificate authority is a trusted third party that generates unique security credentials to the broker as a license and receives in return a licence fee from the broker. The CA is modelled as an actor since there is one CA in Ghana now. The National IT Agency is designated by law as the Certificate Authority in Ghana.

**The Mobile Network Operator (MNO):** The MNO provides mobile money payment services for the payment of goods and services. Vendors and Customers register with MNOs for the mobile money payment services. The MNO takes money from a vendor for each successful mobile money transaction effected by a customer. In Ghana, three MNOs offer mobile money payment services hence they are modelled as a market segment.

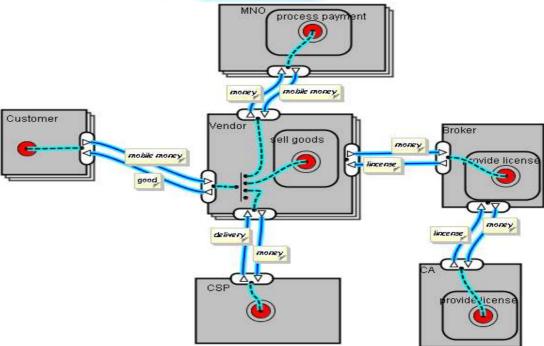
The Courier Service Provider (CSP): The CSP offers delivery service to the customer on behalf of the vendor in exchange of money. The actors, value activities, and value objects are summarised in table 3 below:

TABLE 3: SUMMARY OF ACTORS, VALUE ACTIVITIES AND VALUE OBJECTS

Actor Value Activity		Value Object out	Value object in
Vendor sell goods		goods	money
Customer Buy goods		money	goods
CSP deliver goods		delivery	money
Broker	provide market space	market space	money
CA provide license		license	money
MNO process payment		mobile money	money

The information in table 3 was then used to develop the e3-value model in fig 2 using the e3-value editor.

FIG 2: AN e3-VALUE MODEL OF THE PROPOSED e-COMMERCE IDEA



In the e3-value model in fig 2, there are three scenario Segments. The first is where a CA provides license to a broker in exchange for money (license fee). The second is where a broker provides license to a vendor in exchange for money (license fee). The third is where in a reaction to a start stimulus which is need of a customer for goods, the vendor must supply the goods AND the CSP makes delivery AND there exist a mobile network operator to offer money payment service. The vendor pays the CSP money for delivery and also pays the MNO money for Mobile Money Services. The customer then pays some money in a form of mobile money to the vendor.

#### **PROFITABILITY ANALYSIS**

The e3-value model can be used to perform a quantitative profitability analysis which is also part of the e3-value methodology. It is possible to generate for each actor, an expected Net Cash flow based on the value exchanges and the consumer need. Gordijn and Akkermans (2003) discuss more detail the profitability analysis. The Net Cash is calculated as the Cash Value In – Cash Value Out.

#### THE CASE STUDY

The Challenge bookshop, Abetifi Branch, is selected as a typical case of an SME. Ghana Post's Express Mail Service is also selected as the CSP and MTN, the Mobile Network Operator. Since the broker concept is still abstract, we rely on a conservative market cost of owning a website in Ghana. It is expected that the actual figure in the conceptual model would be lower since SMEs would share marketplace in the concept. From historical data collected from the participating actors, MTN charges recipients of mobile money 1% of transaction value for every successful transaction. The Challenge bookshop sells on average 80 books a day to customers. The average cost of a book is GHc10.50. Ghana post charges an average GHc6.50 per 0.5g parcel for its EMS service. On average, an SME will pay GHc500.00 per year for a website and an Organization would pay GHc500.00 per year for license from a CA. In the case of the customer, the value of goods consumed is equivalent to the cash given away and therefore has a net cash of zero. Yearly(30 days/month, 12 month/year) Profitability sheet for each of the actors is written in table 4, table 5, table 6, table 7 and table 8. All values are in Ghana Cedis.

#### TABLE 4: PROFITABILITY SHEET FOR THE CUSTOMER

Exchanged with Actor	Value In	Value Out	
Vendor	book	16.50	
Net	0		

#### **TABLE 5: PROFITABILITY SHEET FOR VENDOR**

<b>Exchanged with Actor</b>	Value In	Value Out
Customer	475,200	Book
Broker	License	500
MNO	mobile money	4,752
CSP	Delivery	187,200
Net	282,748	

#### TABLE 6: PROFITABILITY SHEET FOR MNO

Exchanged with Actor	Value In	Value Out
Vendor	4,752	mobile money
Net	4,752	

#### **TABLE 7: PROFITABILITY SHEET FOR BROKER**

Exchanged with Actor	Value In	Value Out	
Vendor	500	licence	
CA	license	300	
Net	200		

#### TABLE 8: PROFITABILITY SHEET FOR CA

<b>Exchanged with Actor</b>	Value In	Value Out	
Broker	300	license	
Net	300		

#### TABLE 9: PROFITABILITY SHEET FOR CSP

Exchanged with Actor		Value In	Value Out	
Г	Vendor	187,200	delivery	
	Net	187,200		

The gross profit for each actor is given in table 10.

#### **TABLE 10: GROSS PROFIT FOR PARTICIPATING ACTORS**

TABLE 10: GROSS FROM FOR FAMILIE AT THE ACTURE						
Customer	Vendor	MNO	Broker	CA	CSP	
0.00	282.748.00	4752.00	200.00	300.00	187.200.00	

It is observed from table 10, that all the actors participating in the model, apart from the customer, makes positive profit. The customer is seen to have made zero profit because he consumes the worth of what he pays for.

#### **CONCLUSIONS AND RECOMMENDATION**

This paper proposed an e3-value model for assessing the profitability of each participating actor in the e-commerce model proposed by Amankwa and Kevor (2013) for Ghanaian SMEs. The study elucidated the value activities of the proposed e-commerce model (Amankwa and Kevor e-commerce model, 2013) actors as shown in table 3 above. The result showed that, a vendor's value activity in the model, is to sell goods, a Customer buys goods and a Courier Service Provider (CSP) delivers the goods. A Broker's value activity in the model is to provide the market space, a Certificate Authority to provide licence and a Mobile Network Operator provides payment mechanisms.

The study in its attempt to assess the profitability of such an e-commerce partnership developed an e3-value model with the following actors; vendor, broker, customer, courier service provider, certificate authority and mobile network operator. The e3 model showed the value exchanges between the different actors of the e-commerce model. Data collected through the empirical study for evaluating the profitability levels of the actors also showed that all actors in the model are profitable. Although the e3 model proposed in this research is useful for evaluating the profitability of ecommerce models for possible adoption or rejection, it is also imperative to use the model with care due to its total dependence on the actors.

#### LIMITATIONS OF THE RESEARCH

This study is limited by the different service charge of the participating actors. For example, there are different service charges for the different Mobile Network Operator providing mobile money as a payment option, and this difference could have a material effect on the profitability analysis proposed in this model. Moreover, a single case study has been used which makes generalization difficult.

#### SCOPE FOR FURTHER RESEARCH

This study provides a basis for assessing the profitability of e-commerce models for developing countries. The limitations highlighted in the previous paragraph nevertheless uncover potential areas of research. Further research could also be undertaking to extend the model to cover other developing countries without mobile money adoption. A multiple case study approach can be used to enhance generalization of the model. An empirical study is also needed to investigate the factors for successful implementation.

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