# e-Commerce, Business Methods and Evaluation of Payment Methods in Nigeria

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**Abstract:** E-Commerce is a global trend and can be a viable source of economic reform in a nation. Nigeria, a third world country is leaving no stone unturned to make life easier and more comfortable in this electronic age. Though developed countries are on the verge of conducting e-commerce securely and comfortably, Nigeria is absorbing techniques involved either by espionage, knowledge transfer or other means. Hence, the need for ensuring effectiveness, awareness among inhabitants, and security of resources involved must be taken into account. This paper highlights different levels of e-commerce participation among banks, service providers and the public in Nigeria. A business-inclined metropolitan suburb of Lagos was used as a case study to evaluate citizenry involvement and opinions. Recommendations on the most suitable payment method (s) for citizenry was made based on their opinions.

**Keywords:** e-commerce, payment models.

## 1. Introduction

e-Commerce can be defined as the integration of communications, data management, and security capabilities that allows organizations to exchange information on sale of goods and services. It can also be defined as an act of conducting transaction via electronic medium. Such electronic media can be TV, Fax, or the internet. With the unraveling evolution of GSM in Nigeria, e-commerce brings another untapped method of commerce via mobile devices called m-commerce. Despite these technologies, there are many substandard payment methods in Nigeria with crude ways of handling security issues like authentication and non-repudiation. E-Commerce requires authentication, non-repudiation, confidentiality, and trust to mention a few (S.G.E. Garrett and P.J. Skevington 1999). Internet authentication is best implemented by a process called digital signatures and non-repudiation is a digital signature verification that a purchase is made (Tom Coffrey and Puneet Saidha 1996).

There are two major business models of e-commerce. Business to Business (B2B) model occurs between two organizations characterized by large volumes of products and small price margin. The second is Business to Consumer (B2C) model. It occurs between an organization and an individual. It is characterized by small volumes of products and large price margin. Other e-commerce models are Business to Affiliate model (B2A), Business to Portal model (B2P) and Consumer to Consumer model (C2C) to mention a few (Timothy Cumming 1991). In another sense, e-commerce has been classified into B2B, B2C and electronic markets (P. Morreale and K. Terplan 2001). Major requirements of conducting E-Commerce over the internet are servers (such as web, catalog, certificate, and mail), online merchant account, payment gateway and mail or web host account.

The kind of solution desired depends on individual or organizational financial commitment. For in-house web front or private hosting solutions, all requirements are provided or controlled by the investor while in instant web front solution, only very few requirements are provided or controlled by the investor. Other requirements need to be outsourced. Outsourced requirements include servers and payment gateways. Instant storefront which requires a shared or dedicated web hosting plan provided by a firm is cheaper and easier to maintain than in-house storefront. In developed countries, in-house solutions are mostly put in place while in developing countries like Nigeria, instant solutions are mostly used. Despite this, Nigeria has very few web merchants. Web merchants are individuals or organizations that provide e-commerce services. Alternatively, they facilitate making transactions on internet via websites, electronic mail and so on. Today in Nigeria, there is a need to know the suitable payment method(s) based on the key factors such as security and ease of use. Some of the global payment models are stated below.

### 1.1 Three common payment models

#### *1.1.1 Digital cash*

It entails the use of a digital wallet (a plug-in to web browsers) where invoice or receipt of payment is kept and cash is withdrawn (Timothy Cumming 1991). Advantages are that the transaction is completed


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immediately, and anonymity during transaction is possible. That is, it does not require personal or contact details of the buyer.

#### *1.1.2 Credit card*

A credit card is a card whose holder has been granted a revolving credit line (Abhijit Chaudbury and Jean-Pierre Kuiler 2002 and Reserve Bank of Australia 2005). This does not include a deposit account/facility though an overdraft available. The card enables the holder to make purchases and/or cash advances up to a pre-arranged limit. The credit granted can be settled in full by the end of a specified period (usually 45days or thereabouts) or in part, with the balance taken as extended credit. Interest may be charged on the transaction amounts from the date of each transaction or only on the extended credit where the credit granted has not been settled in full.

#### *1.1.3 Online check/electronic fund transfer*

During the course of making transaction with online check, a buyer enters the digits or numbers found on the check. This is done for authorization purpose while in electronic fund transfer, there is a financial house called Automated Clearing House (ACH) responsible for transferring the money from the buyer's or originator's account to the seller's or recipient's account on completion of transaction (Patiwah Panurach 1996).

### 1.2 Other payment methods

#### *1.2.1 Debit card*

Debit card enables the holder to access funds in a deposit account at an authorized deposit-taking institution (Abhijit Chaudbury and Jean-Pierre Kuiler 2002). In debit card model, a buyer would have a deposit account where all purchases will be deducted from. Anytime one uses a debit card to purchase online or in a traditional store, the card goes through a debit card payment processing. The debit card payment processor gives response immediately. One of the major reasons for using debit card payment model is to ensure that a customer has enough money in his account to make the purchase or transaction.

#### *1.2.2 Micropayment*

Micropayment is a term used for amounts as low as one cent and allows vendors to sell content, information, and services over the internet at very low unit prices. Several companies offer Micropayment solutions such as IBM Micropayments and Compaq's alternative, the MilliCent (Abhijit Chaudbury and Jean-Pierre Kuiler 2002).

#### *1.2.3 Money orders*

Money orders are similar to certified checks, as a known third party such as the U.S. Postal Service, American Express, Western Union, or a bank guarantees the value. The transaction cost is small and the advantage is that it can be sent to the named receiver. The payment still carries some degree of anonymity. If the issuer preserves the privacy of both the seller and the buyer, the transaction is well protected (Abhijit Chaudbury and Jean-Pierre Kuiler 2002).

Having mentioned these payment methods, e-commerce in Nigeria has been predominated by substandard payment methods and varying business methods among her banks.

## 2. e-Commerce methods in Nigerian banks

Majority of the participating banks are new generation banks though the consolidation of Nigerian banks has brought about merging or acquisition between two or more banks.

### 2.1 Types of business methods in Nigeria

#### *2.1.1 Electronic banking (e-banking)*

E-banking can be referred to as a system whereby all the banking services are conducted via electronic medium. Such banking services include money depositing and withdrawal, checking account balance and many more. The banks are characterized by the use of virtual private network (VPN) to connect other

 

branches. Elaborately, the local branches of the bank are connected via Very Small Aperture Terminal (VSAT), a satellite communication system. In this case of e-banking, the network is referred to as Extranet. An extranet is the use of internet technology outside a company's premises to share commercial and operational information and tasks with customers (Okey Nwosu 2005, Marilyn Greenstein and Miklos Vasarhelyi 2002). Alternatively, it is a private network outside a business, whereas the internet is a worldwide, public network. No one outside the permitted customer group can see the extranet. It is securely protected. Customers are able to transact on the bank's website in a secured environment by using Secured Socket Layer (SSL). This makes data transmitted between the client (that is the customer's computer) and the web server to be encrypted hence it requires understanding the keys to retrieve the data. Usually, the client uses the public key while the private key remains with the server. This encryption technique is called Asymmetric Encryption (CIW Study Guide 2004). Few banks carry out e-banking in Nigeria, among them are First Atlantic Bank (now First Inland Bank PLC) and Standard Trust Bank (now United Bank for Africa PLC).

### *2.1.2 Internet banking*

Today's Nigerian banks use VSAT for communication among their branches, what is referred to as Intranet. An intranet is the use of Internet technology inside a company. Emphatically, only staff share customer and operational information as well as tasks (Okey Nwosu 2005, Marilyn Greenstein and Miklos Vasarhelyi 2002). It has made it possible for someone to deposit or withdraw money from any of the branches of his bank. Example of the banks are United Bank for Africa PLC, Zenith Bank PLC and First Inland Bank PLC.

### *2.1.3 Telephone banking*

Astonishingly, some banks still use what is referred to as Telephone banking. An example is Co-operative Bank PLC (now Skype Bank PLC). One branch of the bank calls another where the customer's account domiciles to confirm if the account is valid before performing the task of depositing or withdrawal.

### *2.1.4 Mobile banking (m-banking)*

With the advent of Global System for Mobile Telecommunication (GSM), we now have very few banks using it as a medium of conducting some of their services. An example is The Sapphire FlashClub™ by First Inland Bank PLC (Okey Nwosu 2005). The Sapphire FlashClub is a bank account based on a GSM phone number. Literally, when one signs up for a Sapphire FlashClub account, his phone number becomes the bank account number. And it becomes possible to transfer cash to anyone who owns a GSM phone anywhere in Nigeria (Okey Nwosu 2005). Also with such account, the owner can perform other transactions like buying any of the bank's e-products such as recharge cards for cell phones.

### *2.1.5 Other transaction method(s)*

Among other transaction methods, the widely used is Automated Teller Machine (ATM). ATMs are mostly situated in large stores, and hotels. Someone can cash money from this complex information processing system. It is a complete computer system in a box. It handles at least four media including currency, cards, receipts, and envelopes. It also has self-supervising operating, application, and diagnostic programs; and incorporates sophisticated physical and logical security features (Jerome Svigals 1983).

## 2.2 E-commerce methods by online service providers

### *2.2.1 Web merchants*

Web merchants are those organizations that conduct transaction via their websites. They make it possible for people to buy goods or render services to people via their websites. Examples of these web merchants are Virtualkard.com and Naira.com. They offer prepaid services and charges are based on prevailing currencies exchange rate. Online buyer purchases the card (VirtualKard) based on the amount of the product(s) in dollars that he wants to buy and uses the card information to make his online purchases (VirtualKard (Nig.) PLC 2005). Another payment method is direct payment to the seller's bank. This is an offline method. Some of the companies using this method are Mcreal.net and Signonafrica.com. Both are web hosting companies. It is required that a customer pays into the bank account of the seller or service provider. A proof of payment is required, sometimes the teller is scanned and sent via email as proof of payment before the service is rendered, a process called Non-repudiation

Another trend in our e-commerce is the pre-paid method. This works best for a single operational task (Fola Odufuwa 2005). Our examination boards have proven effective in this area. Joint Matriculation Admission

Board (JAMB), West African Examination Council (WAEC), and National Examination Council (NECO) have made it possible for candidates to check their results online by buying prepaid cards. The card information is used to log on and display results. Mobile Telecommunication Operators like MTN Nigeria, Home Entertainment service providers like Multichoice and many more have provided pre-paid services to attract people and customers though such transaction might not be conducted online.

### *2.2.2 Payment gateway providers*

Payment Gateway Providers process card information used online or at point of sale (POS) terminals. They act as interface to the banking system. Various banks have different proprietary standards hence the need for gateway or interface that can connect to any bank system regardless of her proprietary standard. At present, three payment gateways have been approved in Nigeria. Among them are Interswitch (Interswitch (Nig.) Ltd 2005) and Etranzact. Some of the prevalent payment gateways around the globe are Cybercash, Digicash, and Datacash (Kathy Yakal 1997). Though many more are emerging, each payment gateway has card types or models it supports. Typically, Interswitch supports debit card payment model in Nigeria. Banks such as United Bank for Africa offer debit cards to their customers and use Interswitch as the payment gateway.

## 3. Evaluation of e-Commerce participation by the public

In the course of this research, a questionnaire was used to seek public opinion and analyze their present level of participation in E-commerce. The groups of people involved were scholars, businessmen, graduate and postgraduate students. It was conducted in one of tertiary institutions in suburb of Lagos-State, Nigeria. The chosen location was meant to represent a mix of wealthy and average Nigerians. As at the moment of this evaluation process, the institution has students' capacity of six thousand, approximately four hundred and fifty non-academic staff or semi-skilled workers, and three hundred academic staff. These categories of people were dispersedly given same questionnaire. While the entire people could not be sampled, about one-fifth of them were involved in the evaluation. Learning materials like daily newspaper, articles and face-to-face conversation with staff of some banks, e-commerce service providers were also used in this research.

### 3.1 Research questions:

The multiple choice questions used in determining the extent of participation of Nigerians in e-commerce are these:

- Do you conduct transaction on internet?
- If **yes**, what payment method do you use?
- Your job description
- Your computer competence level
- Should you want to make purchase online, what payment method would you prefer?

While the choice answers are not included here, analyses of the aggregate responses by the public are given in section 3.2.

### 3.2 Presentation of results

**Table 1:** Current and preferred payment methods

| | Current Payment methods | | | | | Preferred Payment methods | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Direct Payment | Credit Card | Prepaid Card | Others | None | Direct Payment | Credit Card | Prepaid Card | Others | None |
| No. of People sampled | 39 | 48 | 127 | 100 | 967 | 376 | 256 | 605 | 134 | 37 |

**Table 2:** Transact online, job description and computer competence level

| | Online Transaction | | Job Description | | Computer Competence Level | | |
|---|---|---|---|---|---|---|---|
| | Yes | No | Student | Worker | Below Average | Average | Good |
| No. of People sampled | 194 | 1006 | 297 | 903 | 53 | 272 | 875 |

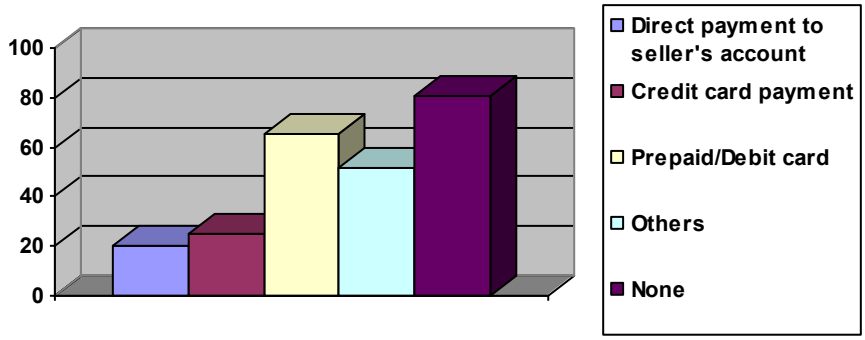


**Figure 1:** Payment methods used by online buyers/sellers

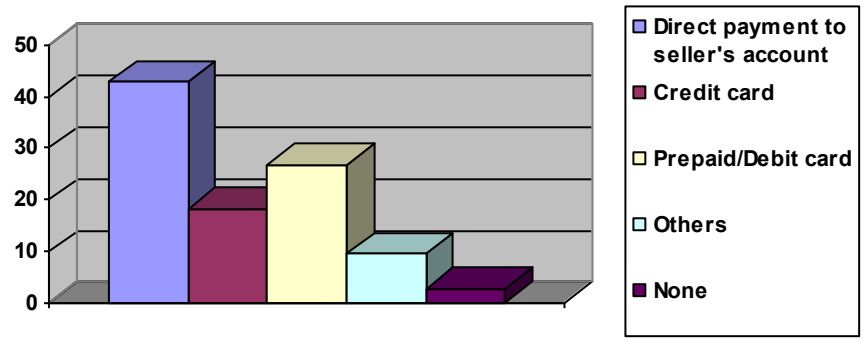


**Figure 2:** Preferred payment methods

### 3.3 Analyses and discussion

Based on the results, about 84% of those sampled do not conduct transactions on internet despite being computer literate (Table 2.0), though some do so without knowing. For instance when one purchases a prepaid card in a bank to check result on the internet, he is invariably carrying out an e-commerce. For those that do e-commerce (approx. 16%), it has been by using direct payments, credit cards, prepaid cards to their settle bills.

Analyses showed that 65% of them use prepaid cards, mostly to check results online, buy airtime or renew subscription to services. About 25% conduct transaction using credit cards, the majority of those in this category make orders from foreign websites. With the current fraudulent practices, Nigeria has been rated as the highest risk country on e-commerce across the globe followed by Indonesia (Cybersource 2005). To date, many orders from Nigeria are unprocessed. Only 20% of those conducting transactions use direct payment methods. Interestingly, many people choose direct payment and prepaid/debit methods. Direct payment means going to bank to pay into the seller's account. This report can play a significant role in making e-commerce formidable in Nigeria, so as to know what measures should be in place to do e-commerce in Nigeria. Having realized this, the response of those sampled to what payment methods should be used has been impressive.

The most preferred method is the prepaid card system. This is rated highest (43%) because of its ease of acquisition and use. In terms of security or safety from online fraudulent activities, about 27% of those sampled prefers direct payment to sellers' account. The third preferred method is the credit card system with approximately 18%. Observation showed that many do not understand the credit card method but as a current trend in payment models for developed countries, many choose it alongside prepaid/debit card methods. In another case, approximately 3% of those sampled made no choice on what is their preferred payment method, an indication that they are unaware of e-commerce at this present age. A suggestion given on preferred payment method was the use of Biometric payment. This is at an experimental stage in the developed nations having been found secured and accurate. Nigeria can rise up to the task though it might take a couple of years should it become a standard in the e-commerce industry.

## 4. Conclusion and recommendation

Indications have shown that the appropriate payment methods for us are prepaid/debit card system and direct payment to sellers' account. Debit card payment method and prepaid payment method are

synonymous since they require that the customer has sufficient money either in his account or by buying a card respectively. For convenience reasons, a prepaid card system is better than direct payment method despite it being rated the highest. Many choose direct payment because of the reduced risk in terms of fraud. At present, confirmation in direct payment method is carried out by sending a soft copy of the teller used in paying. Improvement can be made on this by using a unique number on every teller of payment when sending or indicating the proof of payment. While this can be time-wasting, the prepaid card system has proven effective and fast by its current use to check results. To have a secured card system and ensuring privacy of cardholder, a personal identification number (PIN) is required when making purchases online. Such a card system can gain more acceptability if it is based on a smart card technology capable of being used at point of sales (POS) terminals (Abhijit Chaudbury and Jean-Pierre Kuiler 2002).

With this, a standard debit card payment method can be used to make purchases on any Nigerian physical or online store. Banks and e-commerce service providers need to be actively involved, it is recommended that e-commerce service providers should provide reliable payment gateway to our banks, thereby handling the authorization process in any online purchase. That is, they must provide an immediate response for every card detail submitted during an online purchase. Invariably, they must ensure that the card is valid or has sufficient money to make the order or purchase. Banks will handle the settlement process by transferring the money from cardholder's account to the seller's account. The need for efficient and reliable payment gateways should not be underrated because many banks will produce their own debit or prepaid cards. The payment gateways should be able to connect to these banks regardless of their various proprietary technologies. Also, a regulatory body should be set-up involving both parties to ensure a standard e-commerce system in Nigeria.

With all these, a web merchant or someone that wants to start an e-commerce website can decide on which payment gateway to use and what kind of debit card should be allowed on his website. A one-stop solution will begin to emerge sooner has a bank and a payment gateway may decide to render dependable services. That is, a web merchant who decides to use a particular payment gateway invariably has to use a matching debit card system alongside. This has been implemented in developed countries. Public awareness on benefit of getting our local stores online should be encouraged. It should be emphasized that getting online does not stop the traditional or conventional sales but rather an alternative way of generating more income.

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