# ELECTRONIC PAYMENT SYSTEMS DEVELOPMENT IN A DEVELOPING COUNTRY: THE ROLE OF INSTITUTIONAL ARRANGEMENTS

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**ABSTRACT**
This paper examines the institutional arrangements in the development of Nigeria's electronic payment system (EPS) using a new institutional economics (NIE) perspective. A case study of Nigeria's EPS was carried out using semi structured interviews to collect data from 18 participating stakeholders; a thematic method was used for the data analysis. The study suggests that a well-functioning set of arrangements, which is lacking in the institutional setup in Nigeria may be required to build necessary institutional capacity suitable for development of safe and efficient electronic payment systems. Although the technological payment infrastructure in Nigeria is modern and of comparable standard, the failure to put in place reliable and relevant market and collaborative agreements has not enabled full exploitation of the available infrastructure. Current governance structures show elements of power struggle and distrust between stakeholders (players and regulators), hampering the creation of an environment that would sustain free market economic activities and effective development of payment systems.

**Keywords**
**E**lectronic payment systems, new institutional economics, inter-organizational systems, institutional arrangements, Nigeria, developing country.

## 1. INTRODUCTION

An information system (IS) can be viewed essentially as a social system with some technological elements (Land, 1994; Soriyan, et al. 2001). This indicates a shift from an initial techno-centric focus to a more integrated technology, management, organization and social focus (Elliot and Avison, 2005). It also emphasises the application of technologies and the interactions between people and organizations and the technology. These interactions, the processes or order needed and the governance structure based on defined regulatory framework for the interactions, may be significant in the application of technologies and economic activities (North, 1991). This paper views these interactions, governance structure and regulatory framework as institutional arrangements (North, 1991), and examines their contributions or limitations in the development of Electronic Payments System (EPS).

The UK Academy for Information Systems (UKAIS) describes the IS domain as the study of theories and practices related to the social and technological phenomena, which determine the development, use and effects of information systems in organizations and society. Thus IS has been described as the effective design, delivery, use and impact of information and communication technologies in organizations and societies (Avison and Fitzgerald, 2003). IS effectiveness and success may well therefore depend on the constructive interactions between its contextual social systems and the technology applied.

An Electronic Payment System (EPS) is a form of inter-organizational information system (IOS) for monetary exchange, linking many organizations and individual users. This may require complex interactions between the stakeholders, the technology and the

environment. The unique characteristics of EPS/IOS also differentiate it from traditional internal based information systems; it is more complex and multifaceted technologically, organizationally and, relationally (Sprague and McNurlin, 1993; Boonstra and de Vries, 2005; Kumar and Crook, 1999), highlighting the importance of collaboration and the need to bring all the facets together.

EPS encompasses the total payment processes, which include all the mechanisms, technological systems, institutions, procedures, rules, laws etc. that come into play from the moment a payment instruction is issued by an end-user. Different kinds of rules, regulations, mechanisms, technology and arrangements have therefore been put in place by trading partners, markets and governments (stakeholders involved in EPS development) in all countries and throughout time to develop effective infrastructure of monetary exchange, commonly referred to as payments systems (Bossone and Massimo, 2001).

This situation illustrates the individual and collective importance and influence of rules, regulations and arrangements in the development process of electronic payment systems. It also demonstrates that EPS like other information systems, may be defined by the selection and application of organizational resources (within environmental constraints) (Ives et al. 1980); and is also composed of activities and relations of different groups of stakeholders characterised by inter-organizational issues that are subject to conflicting interest from different stakeholders (Mursu et al. 2000). This is a reflection of the socio-economic and technological context of IS and the moderating influence of environmental socio-economic factors (Pick and Azari, 2008). The information systems development (ISD) process therefore is often adjusted to this context in ensuring the interests of all stakeholders (Korpela et al. 1998). On the other hand, IS in most cases may also not function well within the organizational / external environment unless there is a modification of the system, the organization (institutions) or both (Wijnhoven and Wassenaar, 1990). This may imply the system conforming to organizational (institutional) demands or the organization (institutions) conforming to systems' demands. This supports the argument that technology use, and IS in particular, is modified by organizational, inter-organizational, and institutional arrangements in the development process. Features of the technology are thereby combined with the way users interact and take advantage of the system (Fountain, 2001) through institutional arrangements. Unfortunately little empirical work has been carried out on the institutional arrangements in IOS development, particularly in electronic payment systems. The literature on EPS mainly focuses on technological issues, systems efficiency, risks, choice of payment instruments and managerial/business aspects (Camenisch et al. 1996; Herzberg, 2003; Chau and Poon, 2003; Liao and Wong, 2004; Yu et al. 2002). Organizational and marketing arrangements facilitating payment services and systems development also need to be considered.

This paper therefore examines institutional arrangements in the development of electronic payment systems in a specific context. The contribution or limitation of the institutional arrangements in the developing country context of Nigeria is therefore examined in this paper. The following section provides the background to the problem context.

## 2. BACKGROUND – PROBLEM CONTEXT

IS development has been described as problematic and constrained with diverse challenges in developing countries such as Nigeria which has peculiar socioeconomic environments (Heeks, 2002; Avgerou, 2008; Mursu et al., 2000). EPS development in particular is faced with challenges ranging from lack of adequate legal backing, governance issues, credibility of the human element and lack of skilled resources, integrity of data transmitted, lack of infrastructures, interconnectivity and interoperability (Ovia, 2005), attributable to the country's technological infrastructure and institutional capacity. Many years of development

aid have failed to bring the desired results of developments in most developing countries, partly due to the focus on macro approaches and policies which do not emphasize the local institutional context faced by economic agents in those developing countries. This makes getting the right institutional context a major issue for developing countries (Sautet, 2005) particularly for the development of information systems such as EPS which is embedded and much influenced by the institutional context.

Payment systems development, like every IT development, is seen as both social and political processes (Christiaanse and Huigen, 1997), shaped by the politically and socially constructed realities of its contexts (Currie, 2009). EPS development therefore may have to take into consideration a whole range of factors, particularly the state of development of the socio-political setup in the country which is usually regarded as poorly developed in developing countries. The range of factors to consider include network of actors involved, their interactions and outcomes and how they are influenced by the institutional contexts (King et al. 1994). Another main factor is the processes and elements that make up the payment system which include the payment infrastructure, legal framework and institutional arrangements and how they individually and collectively influence development. EPS is an inter-organizational information system that transcends organizational boundaries, thus the collaboration of the stakeholders and sharing of resources (Kumar et al. 1998) and how it interacts and affect the elements of the payment system may also be key issues in the development of EPS.

Although technology serves as the backbone and driver of EPS and IOS, organizational and collaborative issues that cover working arrangements/relationships, power, regulations, economic, social, trust issues etc, are other key factors to be taken into consideration in the development of any IOS such as EPS (Boonstra and de Vries, 2005; Kumar and Crook, 1999).

Unfortunately EPS development is often too narrowly focused on instruments, technology and infrastructure (CPSS, 2006). This has not yielded anticipated results, particularly in most developing countries where the other elements of payment system are poorly developed and as such fail to give proper support to the payment infrastructures. A payment infrastructure requires supporting institutional arrangements backed up by adequate legal framework. The incentives to improve overall payment system efficiency have been hampered by the perennial impact of risk shifting due to the uncompensated and inadvertent shifting of credit and liquidity risks through payment mechanisms and associated institutions (Greenspan, 1996).

This implicitly challenges the legal, operational and governance elements of the payment system which are institutional, country-specific and represent important aspects of the process of payment system development. These challenges may have contributed to the uneven success of similar reforms in different countries, and resulted in a design-actuality gap (Heeks, 2002) that has made the achievement of planned outcomes difficult in terms of expected use, benefits and costs. The country-specifics of these institutional elements may have to be considered to determine the most appropriate mix and suitable development approach (CPSS, 2006).

## 3. PAYMENT SYSTEMS – ELEMENTS AND STRUCTURES

Electronic payment systems have evolved from a simple system involving cash as a means of exchange to a more sophisticated system involving various institutions and related regulations providing payment instruments and infrastructures allowing for interconnections between various partners or business units in fulfilling their business or social obligations. It could thus be seen to include any payment to businesses, banks and public services from

citizens, businesses or governments, which are executed through electronic networks (Sumanjeet, 2009).

Commercial non-cash electronic transactions, which is the focus of this paper, usually involve a payer and a payee exchanging money for goods or services, and one or two financial institutions acting as an issuer on behalf of the payer or an acquirer on behalf of the payee. A typical payment system therefore interconnects the payer and the payee, and is usually initiated by an instruction from the payer, using an agreed instrument, through the issuer and acquirer and the central bank in computer networks, which enables them to exchange money (CPSS, 2006; Ovia, 2005). The European Central Bank (2010) defines a payment system as consisting of a set of instruments, banking procedures and typically interbank funds transfer systems that ensure circulation of money with minimum delay and cost.

Greenspan (1996) views EPS as a set of mechanisms which can only provide the necessary infrastructure when coupled with appropriate rules and procedures. Therefore having the technology, systems, or instruments such as debit/credit cards without the supporting rules and arrangements between the institutions involved, may not necessarily present a safe and working payment system. There may be a need for a platform of collaborative arrangements for the mechanism. CPSS (2006) therefore views the payment system as comprising all institutional and infrastructure arrangements in a financial system for initiating and transferring monetary claims in the form of commercial bank and central bank liabilities. A national payment system therefore includes a country's entire matrix of institutional and infrastructure arrangements and processes.

The nation's payment infrastructures describe the structures on the ground to facilitate payment transactions. These include payment instruments used to initiate and direct transfer of funds; clearing – the transmission and recording of the instructions to make payment; and settlement – the actual transfer of funds. On the other hand, the nation's institutional arrangements describe the payment services provided, the financial institutions and other organizations providing the services, working relationships amongst these institutions and their customers, and the legal and regulatory framework guiding these services and working relationships. These elements individually and collectively, may influence the direction in which the payment system develops. They are mutually reinforcing and the strength of a payments system depends on the interaction between them, particularly legal frameworks, payment infrastructures and institutional arrangements, where most countries have experienced challenging difficulties in developing a safe and efficient payments system.

## 4. INSTITUTIONAL ARRANGEMENTS AND PAYMENTS SYSTEM DEVELOPMENT

EPS is essentially between two or more stakeholders who must agree on the form or terms (contract) of a beneficial IT/IS business relationship. This agreement or contract made by partnering organizations to govern their relationship, is often referred to as governance structure or institutional arrangement (Williamson, 2000), aimed at crafting order to mitigate conflict and realize mutual gains. It is also a way of protecting the partners from any hazards related to the relationship while at the same time creating incentives for fruitful participation. Information is costly, organizations behave opportunistically, and rationality is bounded therefore, organizations would always attempt to structure the best form of governance for any given relationship by choosing from a set of alternatives, the arrangement that best protect their interests (Williamson, 2000). However, the alternatives which is appropriately referred to as institutional alternatives (Klein, 1999) are constrained by the institutional environment (Williamson, 2000) of the participating organizations which in turn is shaped by historical factors that limit the available options (North, 1991). This implies that there are different forms of organizations/arrangement for different circumstances or relationships as

argued by transaction cost theory, also referred to as governance branch of the new institutional theory (Williamson, 2000).

Johnson et al. (1996) describe cooperative ventures or collaborative relationships, as the marriage of organizations from different cultures (socio-economic, technical etc.), which create a potential for opportunism, conflict and mistrust that may threaten the success and survival of the alliance. Partnerships or cooperative ventures are therefore born of diversity and require capitalizing on that diversity to achieve joint ends (Gray, 1989). This brings to focus the position of Kumar et al.'s (1998) view of the concept of IOS/EPS as planned and managed cooperative ventures between otherwise independent partners, usually taking the form of long-term information technology-related business arrangements regulated by contracts and informally by collaborative behaviours. The implication is that the best form of business arrangement to ensure timely cost effective sharing of information is considered paramount and therefore would be sought for and applied. The regulation of the arrangement to reduce uncertainty and conflict and to ensure maximum cooperation of the partners is also seen as important.

Institutional arrangements in EPS therefore cover organizational and collaborative arrangements facilitating payment services. The focus is usually on market arrangements, mechanisms for consultation with stakeholders and the coordination of oversight of the payment system and its regulation. It is argued that the expansion and strengthening of market arrangements for payment services are key aspects of the evolution of national payment systems as it is crucial for both users and providers (CPSS, 2006). They include the procedures, conventions, regulations and contracts governing the payment service relationships and transactions between service providers and users.

The development of payment systems therefore depends on the collective responsibilities and actions of interested organizations participating in the different aspects and services. It is therefore argued that the success of the developmental efforts requires universal acceptability and market arrangements on the basis of cooperation with institutions involved (Baddeley, 2004). These institutions are stakeholders that are usually systematically arranged in a planned order guided by some pre-determined rules designed for the mutual benefits of all. They have different roles and vested interest which individually and collectively affect the development of the payment system (Sangjo, 2006). It could therefore be considered crucial for an effective collaborative market arrangement and for a strong payment service market to be developed, both for the users and providers. This may however be dependent on the effective coordination of activities in individual and interrelated payment service markets, efficient market pricing conditions, transparency and market education about payment instruments and services, and fair and equitable opportunities for all. It also highlights the relationship and compatibility issue that makes EPS more complex and multifaceted.

EPS institutional arrangements, which incorporate collaboration factors, therefore involve several complex economic, strategic, social, and conflict management issues (Kumar and Crook, 1999). These issues may reflect the interests of the partners and the local business environment influenced by the level of competition, industry standard/rules, political and economic conditions, levels of uncertainty and infrastructural developments. Cannon and Perreault (1999) therefore argue that the business environment could as well determine the type of relationship/arrangement as they observe that different inter-organizational relationship types dominant in different situations, each type of relationship/arrangement requiring different degrees of investments/income and producing different outcomes.

## 5. AIMS AND OBJECTIVES

This research asks how the development of institutional arrangements in Nigeria enhances or hinders the development of the national electronic payments system. The development of payment systems is examined in Nigeria's institutional context and seeks to gain an understanding of institutional influences in electronic payment systems. Institutional influences in this paper are examined in the light of the regulatory framework, collaborative arrangements and payment and settlement procedures which together constitute institutional arrangements.

## 6. INSTITUTIONAL INFLUENCES

The institutional framework of a country is of high significance to parties in an economic exchange and consists of both the legal framework and the institutional arrangements (North, 1991). It raises the benefits of cooperative solutions and reduces transaction costs but the central issue and concern to most government and EPS planners is the evolution of an institutional framework that would create an enabling economic environment (North, 1991) which allows for effective EPS. The quality, level of development, and effectiveness of existing institutional framework, particularly in the developing countries as it enhances or limits the development of payments systems, is therefore questioned. The analysis of the regulatory framework and the organizational/institutional arrangements that drive the payment system, are issues that need to be taken into consideration in EPS development. This makes payment systems development complex and dynamic, and the outcome may depend on factors which cannot be comprehended without taking note of its institutional dimensions (Christiaanse and Huigen, 1997). King et al. (1994), also argue that institutional factors are ubiquitous and essential components for understanding and explaining inter-organizational IT innovations such as EPS. IS studies may therefore also focus on the regulative processes/framework of the country's context, which research indicates influences the shaping of the design and development of IS/EPS (Currie, 2009).

It is also pertinent to note that general IS research has rarely addressed explicitly questions of the socio-economic context of IS innovation (Avgerou, 2008) which is largely institutional. Economic development which is the focus of any IT/IS innovation, particularly electronic payment systems, is a situated, context-specific process that is entangled with indigenous politics and historically-formed institutions. Literature further notes that few economies have historically developed institutional setting that sustains the mutual re-enforcing of competent free-market economic activity and ICT innovation, however, such a process has not been set in motion in developing countries (Avgerou, 2003). This raises a strong argument for the important role of institutions in the development of payment systems, economic development and in fostering economic collaborations. Gaining deep insights into payment system issues also may depend on understanding complex institutions and processes (Greenspan, 1996). This challenges the ability of the researcher to draw on ideas from many different fields of economic research. One notable resource is the New Institutional Economics (NIE) theory which provides clear concepts from which to leverage understanding of the institutional processes in the development of payment systems. NIE is discussed in the theoretical approach section.

## 7. THEORETICAL APPROACH

The New Institutional Economics approach (NIE) posits that the institutional framework (institutional environment and arrangements) of a nation is instrumental to successful collaborative relationships and economic activities/developments, which are basic requirements of a payment systems development (North, 1991; CPSS, 2006). NIE therefore argues that when cost is involved in transactions or when it is costly to transact, institutions

do matter. It portrays institutions (which are basically formed to reduce uncertainty in human exchange) as critical constraints and as the way in which economies cope with market failures. It also gives insight into the role of institutions in shaping patterns of economic activities in a country and offers ways of understanding the economic significance of features of the country such as informal norms, formal rules, regulatory frameworks and organizational arrangements which may be misunderstood or ignored by market based reasoning (Bates, 1995).

These features are reflections of the economic policy measures of governments and the interactions and behaviours of organizations which create the prevailing economic infrastructure and environment, referred to as the institutional environment by institutional theorists. The institutional environment forms the framework in which human action take place (Klein, 1998) politically, socially and economically. It provides structures for everyday life (North, 1991) as humanly devised constraints or rules that guides individual behaviour. They define and limit the scope of search of economic choices and therefore determine or rather reduce costs (Avgerou, 2003) associated with transactions which impact on the profitability and feasibility of engaging in economic activity. They also reduce uncertainty by the provision of enforcement mechanisms. This institutional framework of constraints and rules are therefore of high significance to parties in an economic exchange whose desire would obviously be to economise on transaction costs particularly in a world in which information is costly, opportunistic behaviours are manifested regularly, and rationality is bounded (Powell and DiMaggio, 1991).

NIE therefore argues for the need to identify institutional arrangements suitable for carrying out economic transactions and exchange of property rights and seeks to explain economic relationships and the development of organizational settings in a world of imperfect actors (Laffont and Martimort, 2002; Williamson, 2000).

Getting the institutional environment right, that is setting the right formal rules which works well and acknowledges the influence of the informal norms is therefore essential to enhance EPS development. Having the right governance structure where regulations are well defined and enforced to enhance contractual relations between players/stakeholders, to craft order, mitigate conflicts and enhance mutual gains is also seen as paramount in effective EPS development.

This paper focuses on the institutional arrangements and role in the development of EPS. The theoretical framework of the paper therefore is built around features of playing the ‘game’ right (the governance structure). The features are the contractual relations between players/stakeholders and the impact on EPS development; suitable (the ‘right’) institutional arrangement for transactions and impact on EPS development; well defined regulations and enforcement characteristics to enhance effective development of EPS and; payment and settlement procedures to craft order.

## 8. RESEARCH APPROACH

A qualitative research approach is adopted because of its array of interpretative techniques which seek to describe, decode, translate and otherwise come to terms with the meaning (Van Maanen, 1979), not the frequency, of naturally occurring phenomena in the social world. The aim is to gain an understanding of government’s views and attempts in institutionalising regulatory framework/arrangements, the impact and the responses of organizations and users (Myers, 2009). These are real life social issues that cannot be quantified or measured and analysed statistically, but require in-depth understanding and interpretation.

### 8.1 Research Design

An interpretative case study was carried out (Bryman et. al., 2001). The organizations investigated during the study included regulatory organizations, switching companies, deposit money banks and third party independent service operators and users. The regulatory organizations have oversight responsibility and initiate policies, rules and regulations covering all aspects of EPS. The switching companies are transaction switching and processing service providers, facilitating the exchange of value between financial service providers, merchants, their customers and other stakeholders. Deposit money banks are financial service providers issuing payment tokens such as credit/debit cards, vouchers, etc, used on the network of switches. Third party organizations are independent service operators, payments processing institutions, solution providers and users.

### 8.2 Data Collection

The data collection method used was semi-structured interviews. A total of 18 participants (among all the stakeholders) were interviewed over a two month period. Most participants were interviewed more than once (for follow-up purposes). The interviews were recorded (with agreement) and transcribed for analysis. The interview questions were guided and structured based on the themes/issues deducted from the literature review and theoretical background. These covered the following areas:

- Rules, regulation and agreements – are they clearly defined for easy understanding?
- Payment and settlement procedures – are they clearly defined?
- Competition and co-operation
    - Market driven competition – is it allowed and are the rules defined?
    - Sharing of infrastructures – setting-up non-competitive infrastructure?
    - Interoperability and interconnectivity – do rules and agreements allow for it?

### 8.3 Data Analysis

A thematic analysis approach was used in the data analysis (Boyatzis, 1998). Recorded interview data were transcribed in sufficient details that retain needed information. This created a familiarity with the data, enhanced a better understanding and started the initial development of ideas and meanings of the data (Riessman, 1993; Lapadat and Lindsay, 1999).

With this understanding gained and the generation of initial ideas, codes were developed for the interesting features of the data identified which also enabled grouping of the data set representing patterns or meanings that relate to the theoretical framework outlined in the last session.

The thematic analysis was therefore essentially a theoretically driven or deductive approach which enabled a more detailed analysis of the focal point of the research in the data set. But for comprehensiveness, new themes/issues that may be induced and used together with the deduced themes were looked for in the overall data set. Major themes identified are regulations and operating arrangements; cooperation and competition; and payment and settlement procedures.

## 9. NIGERIA'S PAYMENT SYSTEM

The Federal government of Nigeria through its agencies and the banking sector has taken significant strides in the last 15 years to modernise the payment system. The system has been unexploited, problematic and constrained by diverse challenges ranging from lack of adequate legal backing, credibility of the human element, integrity of data transmitted, to interconnectivity and interoperability (Central Bank of Nigeria, 2010). The Nigerian payment

system is predominantly cash based due to a culture informed largely by ignorance, illiteracy and lack of appreciation of other non-cash instruments (Ovia, 2005).

The development of Nigeria's national payment system has thus witnessed some remarkable achievements in the last ten years, evolving from rudimentary payment systems to paper and other electronic payments instruments. The pace of development is described as high in terms of achievements within its short life span and the challenges encountered. The technological infrastructure put in place by the private stakeholders such as the banks and switching companies for the EPS, is also seen as current and of high standard, comparable to some payment infrastructures in other developed countries. For instance the use of chip and pin electronic cards, currently used in Europe and just taking off in America, started in Nigeria five years ago. The Central Bank of Nigeria (CBN), guided by the economic policies of the government and in collaboration with the Banker's committee, has introduced several measures to modernise the payment system in Nigeria with mixed results.

A re-engineering and re-structuring of CBN's organization and functions has also been undertaken and a set of national payment system policy objectives as guideline and framework for all payment system initiatives was put in place. The primary goal of the policy/objective is to ensure that the system is available without interruption, meet as far as possible all user's needs and operate at minimum risk and reasonable cost. In accomplishing this goal, the Nigeria Inter-Bank Settlement System company was incorporated in 1993 but commenced operation in 1994 with the sole mandate of providing a mechanism for same day clearing and settlement of inter-bank transfers and payments (funds transfer and settlement system); providing infrastructure for automated processing and settlement of transactions between banks (automated clearing operations); providing the framework for elevating efficiency in funds transfer (automated clearing of direct credit/debit instruments); and developing an integrated nationwide network (Nigeria central switch) to facilitate interconnectivity and interoperability of switches.

Consequently, to encourage the use of cheques and enhance the efficiency of the payments system, the cheque clearing system was automated with the establishment of the centralised automated clearing process in Lagos clearing zone in 2002, later extended to Abuja in 2005 and another six additional clearing zones in 2008. This initially reduced the clearing cycle from 5 to 3 days for local instruments and from 9 to 6 days for up-country instruments, which has now been harmonised at T+2 (three working days) for both local and up-country instruments. This guarantees a customer to take value for clearing cheques after one day. The development of an automated clearing system is believed to be an essential infrastructure in the banking sector and also as a baseline for the development and integration of other payments in electronic banking. But despite these efforts, the Nigerian payment system remains largely cash-based

In 2003 the central bank issued some guidelines on e-banking in an attempt to encourage the use of cards as payment instruments in Nigeria. This encouraged e-payment initiatives by private card/switch operators who introduced their cards, point of sales (POS) terminals and switches. But it also brought on board independent service operators for ATMs and POS who alongside the banks competed in placing ATMs and the cards and operated individual switches making interconnectivity and interoperability difficult with high cost of operations.

In the quest for a robust and efficient payments system aimed at increasing the diversity and liquidity of payment instruments, responsive to the needs of the users and minimise payment risks, a National Payments System Committee (NPSC) was reconstituted in 2005 to promote the development of the Nigerian payments system. An earlier committee, established in 2002, was noted to be ineffective largely due to weak and unresponsive organizational / institutional structures that allowed for un-coordinated and unsatisfactory

level of co-operation of individual stakeholder's efforts and participation in the development of the payments system. The tasks of the new committee therefore included providing a forum for payment system participants and stakeholders to address emerging issues and to co-operate in the provision of payment services and infrastructure; promoting the institutionalisation of payment system reforms and development through the articulation of a comprehensive payment systems legal framework and its development into a national payment systems act; facilitating the codification of standards, guidelines, rules and regulations for the safety and operational effectiveness and efficiency of the Nigerian payments system.

These laudable attempts and measures have experienced only some measure of success and setbacks arising mostly from the institutional arrangements/framework and legal framework. Tables 1 and 2 show the timeline of activities/achievements and the forms/level of development in Nigerian payment systems.

## 10. FINDINGS AND DISCUSSION

### 10.1 Regulations and Operating Arrangements

The role of the regulatory bodies in designing and putting in place effective market arrangements for the development of electronic payment systems in Nigeria was a major issue. Until very recently, the government and development of the payment system was by the players (other stakeholders, mainly financial institutions) while the regulatory bodies played passive roles. This created a field day for the operators/players to introduce uncoordinated payment schemes/products and charges, independent infrastructures and unhealthy rivalries and competition. Planned and systematic development was obviously missing. One banking staff respondent sums it up as chaos:

> "When there is an industry governed by players and not regulators, there is a problem"
> "The regulators woke up late but do not even show to have full understanding of the dynamics of the payment system"

The ability of the regulators to provide a relevant platform for stakeholders' participation and effectiveness was questioned as guidelines and policies issued created more confusion among the players and tried to truncate the already developed plans of the private players. As remarked by another banking staff respondent:

> "The regulators are reactionaries always trying to checkmate ideas from players with policies having some political undertones"

The setting up of a platform, connecting all switches (privately owned) called the central switch, created a lot of confusion. The arrangement was for one of the private switches to take the role of a central switch but with a lot of restrictions and arm twisting rules which killed the move. Thus the regulatory body decided to set up the central switch but rather than connecting private switches, went ahead to directly connect banks and introduced their branded payment schemes and products, thus becoming both a player and a regulator. This is bound to be frustrated, as remarked by a switching company player respondent:

> "The concept of a central switch is defeated, they are killing private businesses, and it is bound to be frustrated, even the rules and arrangements are not clearly defined"
> "These setbacks are slowing down development and a waste of time and other resources"

**Table 1. Summary of Nigerian Payments System Achievements 1993 – 2007 (Central Bank of Nigeria, 2010)**

| | |
|---|---|
| Implementation of MICR | 1993 |
| Establishment of NIBSS | 1994 |
| Setting up of Technical committee on Automation of clearing System/appointment of consultants | 1996-1997 |
| Full implementation of National Automated Clearing system (NACS) | 2002 |
| Reduction of clearing cycle time to T+3 | 2002 |
| Guidelines to E-banking | 2003 |
| Establishment of switching companies and Interoperability of/shared ATM/POS | 2004 |
| New settlement framework (for cheque clearing) | 2004 |
| Reconstituted National Payments System Committee and technical sub-committee | 2005 |
| Live run of CBN Inter-bank Funds Transfer System (CIFTS) | 2006 |
| Development of Payments System Vision 2020 | 2007 |
| Inauguration of Payments System Work Group for Vision | 2007 |

**Table 2. Electronic Payments Transactions for Nigeria for 2003 – 2007 (Central Bank of Nigeria, 2010)**

| ATM and POS Terminals | 2003 | 2004 | 2005 | 2006 | 2007 |
|---|---|---|---|---|---|
| No. Of ATM in Nigeria | 101 | 352 | 532 | 1426 | 3676 |
| Volume of transactions | 240,192 | 1,207,576 | 3,489,845 | 12,138,109 | 15,731,630 |
| Value of transactions (Millions of Naira) | 1,206.00 | 4,344.57 | 17,315.00 | 63,238.87 | 131,562.67 |
| Offline POS Terminals | | | | | |
| Volume of transactions | 887 | 1,055,653 | 1,063,915 | 557,508 | |
| Value of transactions (Millions of Naira) | 49,621.00 | 61,279.50 | 41,334.43 | 19,302.18 | |
| Online POS Terminals | | | | | |
| Volume of transactions | | | | 71,063 | 421,946 |
| Value of transactions (Millions of Naira) | | | | 559.23 | 6442.07 |
| Web Payments | | | | | |
| Volume of transactions | | | | 440,733 | 665,015 |
| Value of transactions (Millions of Naira) | | | | 97.51 | 95,551.79 |
| Mobile payments | | | | | |
| Volume of transactions | | | | 222,210 | 903,067 |
| Value of transactions (Millions of Naira) | | | | 3,023.19 | 10,622.63 |

The findings clearly show no viable working arrangement or governance structure that can control opportunism and other excesses of stakeholders; the players are in charge and determine the rule of the game (Williamson, 2000). The existing structure therefore has not been able to advance the development of electronic payment systems. Its ability to support and sustain commercial relationships (North, 1991) is in doubt as the policies and rules guiding procedures and agreements are most times not clearly defined, misunderstood and create confusion. The market arrangement cannot be said to be appropriate nor efficient.

### 10.2 Co-Operation and Competition

The development of electronic payment in Nigeria has been largely affected by the activities of private stakeholders. The introduction of guidelines on E-banking in 2003 by the central bank encouraged uncoordinated e-payment initiatives by private card/switch operators with private ATM'S , cards and switches making interconnectivity and interoperability. These stakeholders were guided strictly by their private interests and business motives and were prepared to protect these interests at all cost. A private operator captured this feeling in this remark:

> "The stakeholders are in the market to make money, and would use all available means, not minding the effect on the improvement/development of the system"

The central bank (regulatory body) welcomed the participation of the stakeholders but viewed the competitive activities as unhealthy and not favourable for development. Guidelines were therefore issued to halt this trend and to put structure in place for participation and operations as observed by a private stakeholder:

> "They (regulators) are now defining specific rules and procedures that is affecting and influencing the structure and nature of the industry"

One notable guideline which became controversial and much resisted by the stakeholders was the restriction of banks to install ATM'S only in their premises, while three independent ATM service providers were licensed to facilitate interoperability. The stakeholders viewed this guideline as creating a monopolistic structure, defining and restricting entry and participation of other players/stakeholders:

> "They (regulators) are defining rules and also defining players; it is creating monopoly and surely will be restricted"
> "We (players) would rather prefer policy definition and enforcement to players' definition and enforcement"
> "Regulators should focus aggressively on policy formulation and enforcement, let the market discipline the players"

The regulators responded by seeking a collaboration effort through mediation to enhance cooperation among the players and the regulatory body as remarked by a regulatory stakeholder:

> "It is still a collaborative thing, no enforcement or sanction yet"

The formation of a national payment systems committee whose main task was to bring together all participants in the industry, was a welcome idea as remarked by a stakeholder banking participant:

> "There is a great need for the stakeholders to come together to address the challenges of the system"

The feedback from this committee forms the basis of most policy rules and regulations. This provided an environment for participatory policy formulation as remarked a stakeholder (switching company) participant:

> "They (regulators) now engage in participatory policy formulation which enables us to present input to the policies as we sort out issues of concern"

The findings also indicate that there is no appropriate institutional settings that sustain the mutual re-enforcing of free-market economic activity of the stakeholders and electronic payment services which is a requirement for successful IS development (Avgerou, 2003). The collaborative arrangement for payment services and system development is evolving and may not yet have a solid structure. Its efficiency is also in doubt.

### 10.3 Payment and Settlement Procedures

The development of electronic payment systems in Nigeria was boosted in 2009 by a government policy directive instructing all payments by government offices to be paid electronically. This was followed up with specific rules, procedures and enforcement mechanism. Guidelines for interbank transfer, clearing of cheques and settlement were also released. The scope and depth of the rules and the extent of coverage of every aspect of the electronic payment system was however challenged by unforeseen issues of payment and settlement.

> "The rules may not be sufficient; they are evolving, reviewed and evaluated regularly as situation change or as customer complain come in"
> "The procedures are tailored around best practices but the issues of change or review reflects social issues." – A regulatory stakeholder

This reflects the inadequate knowledge about the overall breath of the system and the limited information about emerging needs of the society. These are common problems affecting effective development of national electronic payment system (CPSS, 2006). It also demonstrates the need for a country specific assessment for effective payment system development.

## 11. CONCLUSION

The success of collaborative and economic relationships such as EPS depends largely on the institutional arrangement and its evolution to accommodate the emergent needs of society and interests of stakeholders. However, this position cannot be seen in the case of EPS development in Nigeria. The government regulatory body's attempt to institutionalize new sets of market and collaborative arrangements failed to create an enabling environment for fast-track development of EPS. Before the regulatory body's intervention, the activities of the private stakeholders brought about developments in many aspects of EPS. But now, the governance structure is in disarray, showing elements of a power struggle between the private stakeholders and the regulators. The private players do not have much trust in the ability of the arrangements to provide safe and convenient settings for the effective development of the payment system; the regulator's knowledge of the EPS, its requirements and needs/interest of the society and players are always in doubt.

A 'setting' to promote clear and transparent agreements among the players to enhance interactions among players and interoperability of infrastructures is therefore lacking. The new arrangement and the institutional settings have not been developed to sustain mutual re-enforcing of competent free-market economic activities of the private stakeholders and EPS development (Avgerou, 2003). The arrangements and system procedures that facilitate connections and fund transfer between members, that constitute the payment system, and create a well-functioning set of arrangements is therefore required for an effective and efficient development of safe and efficient electronic payment systems. The lack of tangible development in Nigeria's EPS could be attributed to the unfavourable set of arrangements currently in place.

## 12. RESEARCH IMPLICATIONS

This paper re-enforces the position of new institutional economics (NIE) that institutional arrangements are instrumental to collaborative economic activities and developments. It also shows the interactions of the institutional arrangement with the technological infrastructures and other elements of the EPS, identifying the important roles. The development of EPS not only depends on the effectiveness of the technological infrastructures, but on the building of a viable institutional capacity that will provide a suitable environment. The use of NIE theory thus enabled the research to analyse the institutional arrangements and its suitability in meeting the needs of society, the interest of the stakeholders and overall development of EPS.

The policy implication and contribution of this research is the understanding of why effective EPS development is problematic in certain institutional contexts. This understanding could help in building required institutional capacity and an economic environment that enhances effective development of payment systems in a developing country, such as Nigeria. The contribution for the academic community is an improved understanding of the influence and interactions of the elements of the payment system in the effective development of payment systems in Nigeria. It also highlights the benefits of applying economic principles combined with institutional theory in the development of information systems, such as EPS which is interwoven with economic and economic interests of stakeholders. For practitioners, the contribution may be a guide that helps in building institutional capacity and an environment suitable for effective payment systems development.

## 12. REFERENCES

Avgerou, C. (2008) Information Systems in Developing Countries: A Critical Research Review, *Journal of Information Technology*, 23, 133-146.

Avgerou, C. (2003) The Link between ICT and Economic Growth in the Discourse of Development, in: Korpela, M., Montealegre, R. and Poulymenakou, A. (eds), *Organizational Information Systems in the Context of Globalization.* New York, USA: Springer, 373-386.

Avison, D.E. and Fitzgerald, G. (2003) *Information Systems Development Methodologies, Techniques and Tools.* 3rd Ed. London: McGraw-Hill.

Baddeley, M. (2004) Using E-cash in the New Economy: An Economic Analysis of Micro-Payment Systems, *Journal of Electronic Commerce Research,* 5, 4, 239-253.

Bates, R.H. (1995) Social Dilemmas and Rational Individuals: An Assessment of the New Institutionalism, in: Harris, J., Hunter, J. and Lewis, C. (Eds) *The New Institutional Economics and Third World Development.* London: Routledge, 27-48.

Boonstra, A. and de Vries, J. (2005) Analyzing Inter-Organizational Systems from a Power and Interest Perspective, *International Journal of Information Management,* 25, 485-501.

Bossone, B. and Massimo, C. (2001) *The Oversight of the Payments Systems: A Framework for the Development and Governance of Payment Systems in Emerging Economies.* 1. CEMLA/WORLD BANK.

Boyatzis, R.E. (1998) *Transforming Qualitative Information: Thematic Analysis and Code Development.* California: Sage Publications Ltd.

Bryman, A. (Ed) (2001) *Social Research Methods.* Oxford University Press.

Camenisch, J., Piveteau, J. and Stadler, M. (1996) An Efficient Fair Payment System, *Proceedings of the 3rd ACM Conference on Computer and Communication Security.*

Central Bank of Nigeria (2010) Payment Systems Evolution http://www.cenbank.org.

Chau, P. and Poon, S. (2003) Octopus; An e-Cash Payment System Success Story, *Communications of the ACM*, 46, 9, 129-133.

Christiaanse, E. and Huigen, J. (1997) Institutional Dimensions in Information Technology Implementation in Complex Network Settings, *European Journal of Information Systems*, 6, 2, 77-85.

CPSS (2006) *General Guidance for National Payment System Development.* Switzerland: Bank for International Settlement.

Currie, W. (2009) Contextualising the IT Artefact: Towards a Wider Research Agenda for IS Using Institutional Theory, *Information Technology and People*, 22, 1, 63-77.

Elliot, S. and Avison, D.E. (2005) Discipline of Information Systems, in: Avison, D.E. and Pries-Heje, J. (Eds), *Research in Information Systems: A Handbook for Research Supervisors and their Students.* Butterworth Heinemann, 185-206.

European Central Bank (2010), The Payment System. http://www.ecb.int/pub.

Fountain, J. (2001) Building the Vitual State: Information technology and Institutional Change, *The Brookings Institution.*

Greenspan, A. (1996) Remarks on Evolving Payment System Issues, *Journal of Money, Credit and Banking*, 28, 4, 689-695.

Gray, B. (1989) *Collaborating: Finding Common Ground for Multiparty Problems.* San Fracisco: Jossey-Bass.

Heeks, R. (2002) Information Systems and Developing Countries: Failure, Success, and Local Improvisations, *The Information Society*, 18, 101-112.

Herzberg, A. (2003) Payment and Banking with Mobile Personal Devices, *Communications of the ACM*, 46, 5, 53-58.

Ives, B., Hamilton, S. and Davis, G.B. (1980) A Framework for Research in Computer Based Management Information Systems, *Management Science*, 26, 9, 910-934.

Johnson, J.L., Cullen, J.B., Sakano, T. and Takenouchi, H. (1996) Setting the Stage for Trust and Strategic Integration in Japanese-US Cooperative Alliances, *Journal of International Business Studies*, 27, 981-1004.

King, J., Gurbaxani, V., Kraemer, K.L., McFarlan, F.W., Raman, K.S. and Yap, C.S. (1994) Institutional Factors in Information Technology Innovation, *Information Research*, 5, 2, 139-169.

Klein, P.G. (1998) New Institutional Economics. http://ssrn.com/abstract=115811.

Korpela, M., Soriyan, A.H., Olufokunbi, K. and Mursu, A. (1998) Blueprint for an African Systems Development Methodology: An Action Research project in the Health Sector, in Avgerou, C. *Implementation and Evaluation of Information Systems in Developing Countries, International Federation for Information Processing.* Vienna: 273-285.

Kumar, K., Van Dissel, H.G. and Bielli, P. (1998) The Merchant of Prato-Revisited: Toward a Third Rationality of Information Systems, *MIS Quarterly*, 22, 2, 199-225.

Kumar, R.L. and Crook, C.W. (1999) A Multi-Disciplinary Framework for the Management of Interorganizational Systems, *Data Base for Advances in Information Systems*, 30, 1, 22-37.

Laffont, J. and Martimort, D. (2002) *The Theory of Incentives - The Principal-Agent Model.* Princeton: Princeton University Press.

Land, F.F. (1994) The Information System Domain, in: Galliers, R.D. (Ed), *Information Systems Research: Issues, Methods and Practical Guidelines.* Henley-on-Thames: Alfed Waller, 6-13.

Lapadat, J. and Lindsay, A. (1999) Transcription in Research and Practice: From Standardisation of Technique to Interpretive Positionings, *Qualitative Inquiry,* 5, 64-86.

Liao, Z. and Wong, W. (2004) The Sustainability of a Smart Card for Micro E-payment System, *Australian Conference on Information Systems*.

Mursu, A., Soriyan, A.H., Olufokunbi, K. and Korpela, M. (2000) Information Systems Development in a Developing Country: Theoretical Analysis of Special Requirements in Nigeria and Africa. *Proceedings of the 33rd Hawaii International Conference on System Sciences.*

Myers, M.D. (2009) *Qualitative Research in Business & Management.* London: Sage.

North, D.C. (1991) Institutions. *The Journal of Economic Perspectives*, 5, 1, 97-112.

Ovia, J. (2005) Enhancing the Efficiency of the Nigerian Payments System, *Central Bank of Nigeria Bulletin*, 29, 1

Pick, J.B. and Azari, R. (2008) Global Digital Divide: Influence of Socioeconomic, Governmental, and Accessibility Factors on Information Technology, *Information Technology for Development*, 14, 2, 91-115.

Powell, W.W. and Dimaggio, P.J. (Eds) (1991) *The New Institutionalism in Organizational Analysis.* The University of Chicago Press.

Riessman, C. (1993) *Narrative Analysis.* Sage.

Sangjo, O. (2006) A Stakeholder Perspective on Successful Electronic Payment Systems Diffusion, *Proceedings of the 39th Hawaii International Conference on System Sciences.*

Sautet, F. (2005) *The Role of Institutions in Entrepreneurship: Implications for Development Policy*, Mercatus Policy Series.

Soriyan, A.H., Mursu, A., Akinde, D.A. and Korpela, M. (2001) Information Systems Development in Nigerian Software Companies: Research Methodology and Assessment from the Healthcare Sector's perspective. *The Electronic Journal of Information Systems in Developing Countries*, 5, 4, 1-18.

Sprague, R.H. and McNurlin, B.C. (Eds) (1993) *Information Systems Management in Practice.* Englewood Cliffs: Prentice Hall.

Sumanjeet, S. (2009) Emergence of Payment systems in the Age of Electronic Commerce: The State of Art, *Global Journal of International Business Research*, 2, 2, 17-36.

Van Maanen, J. (1979) Reclaiming Qualitative methods for Organizational Research: A Preface, *Administrative Science Quarterly,* 24, 520-526.

Wijnhoven, A.B.J.M. and Wassenaar, D.A. (1990) The Impact of IT on Organizations: The State of the Art, *International Journal of Information Management*, 10, 35-53.

Williamson, O. (2000) The New Institutional Economics: Taking Stock, Looking Ahead. *Journal of Economic Literature*, 38, 595-613.

Yu, H., Hsi, K. and Kuo, P. (2002) Electronic Payment Systems: An Analysis and Comparison of Types. *Technology in Society*, 24, 3, 331-347.