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Evaluating the Effect of ICTs on Development Using the Capability Approach: The case of the Nigerian Pre-paid Electricity Billing

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INTRODUCTION

In recent years, there has been vast investment on ICT initiatives in developing countries for social, economic and political development. Yet, the impact of these investments on development is difficult to determine. The reason for this is partly because “development” itself is an extremely debated notion, and a clear engagement with it demands a familiarity with the development theories, as well as willingness to engage explicitly with other research disciplines (Walsham & Thompson, 2010); or partly due to a lack of assessment guidance (Bhatnagar & Singh, 2010).

In the context of developing countries, literatures are limited in resources when it comes to evaluating the impact of ICT for development (ICT4D) projects although assessing of the projects represents a significant element of decision and policy making (Kamel et al., 2009). Till date, majority of academic research on evaluation of ICT4D projects are clustered around design, transfer and implementation issues (Bhatnagar & Singh, 2010). They tend to focus solely on the supply side benefits of ICT infrastructure and on the identification of constraints within the structure of institutions in developing countries (Madon, 2004), rather than seeking to inform policy relating to areas to which ICT can serve more strategic and broader development goals (Walsham & Thompson, 2010).

For example, Idowu et al. (2008) evaluation of health information systems in Nigeria focuses mainly on its implementation. McGrath & Maiye (2010) explores the role of institutions in promoting ICT adoption in developing countries. Other studies have examined the scope of replication and long-term sustainability of a project (Best & Kumar, 2008; Kumar, 2006). This literature tends to assess the systems mainly from the viewpoint of projects whose implementation goals have been strictly defined and that can be evaluated by parametric methods (De, 2006).

Certainly, literature have also been produced on ICTs contribution to development (see Madon, 2004, De, 2006) but their impact assessment often lacked rigour: being descriptive rather than analytical; and often lacking a concrete foundation of, or lacking clarity around research methods (Heeks, 2010). Also the development aspects that characterize many ICT4D projects are not properly paid attention to and needs to be highlighted (Grimsley & Meehan, 2007; Walsham, 2010).

Firstly, most reported papers on ICT4D pay less attention to the fact that majority of the world's population is accounted in developing countries. They contain millions of people who lack access to resources such as adequate housing, clean water, education and health facilities for satisfying basic human needs. Furthermore, majority of the people in developing countries lack

the freedom to make choices in their own lives (Sen, 1999). These present moral circumstances with which we should all be concerned (Walsham et al., 2007).

Secondly, ICT4D projects are huge public initiatives that impact the lives of millions of people. They affect their ways of working and making a living. The introduction of these systems brings about disruptive and radical changes in people way of life and their impacts need to be understood in the larger context of development and related issues. Hence, to understand these impacts we need to address the question of what is meant by development as most IS literatures in developing countries have failed to address it (Thompson, 2008).

This paper seeks to address a significant research need in developing countries through studying ICT investments in developing countries and their implications on economic development. It seeks to understand the developmental impact of ICT- as opposed to what happens to ICT when deployed within the context of developing countries. The study evaluates the scope and limitation of the developmental interventions surrounding the introduction of the pre-paid electricity billing system in Nigeria. The contribution of this paper, therefore, is twofold: first, it provides insights into why ICT4D projects fail to achieve their intended purposes and second, it allows an evaluation of ICT4D projects by moving beyond the space that focuses on economic growth to consider and operate in the space that concentrates on the effective opportunities people have to achieve what they consider to be valuable in life.

The rest of this paper begins with a discussion of the relationship between ICTs and development, focusing on human development as the key concern of our study. The next section describes the theoretical perspective through which we evaluate the impact of an ICT4D initiative to enable people have better access to electricity. We introduce some core concepts of Sen's capability approach (CA) which informs our evaluation of the scope and limitation of the focal intervention. The next section presents the research method together with a supporting rationale. Then we provide details of our research setting followed by the analysis of our case. The last section presents the conclusion and implications for research and practice.

ICT AND DEVELOPMENT

The relationship between ICT and development is a well-debated topic. There is the optimistic camp that says ICT will lead to rapid economic development. Members of this camp suggest the facilitation of market mechanisms (e.g. deregulation, structural reforms, and privatisation) as the means to economic growth in developing countries (UNDP, 2001).

The pessimistic camp differ significantly from the optimistic camp and suggest that ICT for development need to shift from market driven economic reasoning to consideration of the social conditions that sustain it (Avgerou, 2003) rather than seeing ICT as a 'silver bullet' for development (Walsham, 2010). This perspective suggest for poverty alleviation, improvement of basic healthcare and education infrastructure (Ngwenyama, 2006) and reforms of government and bureaucratic structures (Ciborra & Navarra, 2005).

However, Sein & Harindranath (2004) noted that the ambiguous findings and diverse opinions from both camps are because they do not have a conceptual clarity on the role of ICT in national development. They suggest that ICT needs to be conceptualised in its many facets, perceptions and its manifold impact in societies. Walsham (2003) goes further to argue that ICT are deeply implicated in the approaches we take 'development'. In this light, we see Prakash & De (2007) who noted that the notions of development influence the choice of technology design and use and unless these notions are consistent with the contextual dimensions, the desired consequences might not ensue.

Furthermore, the belief in the superiority of scientific and technical knowledge over indigenous knowledge and traditional practices continues to persist (Puri & Sahay, 2007). This makes developmental initiatives problematic at the long run. The reason for this could be as a result of the ill-formulated intervention strategies that guide development (Soeftestad & Sein, 2003); or little consideration for the local factors that affect implementation and usage of systems when they are shaped in the context of more advanced nations (Maumbe et al., 2008).

Decades of research that examines the role of ICT4D reveals that technology has failed to achieve its intended purposes (Heeks, 2002, Soefstestad & Sein, 2003) and there is not yet evidence to show that investments in ICT leads to economic growth and improvement of basic needs in developing countries (Avgerou, 2003; Akpan, 2003). This has led Walsham et al. (2007) to call for more emphasis on the aspect of development being pursued, which will be discussed in the following section.

DEVELOPMENT

Understanding ICT4D cannot be complete without understanding the notion of development. The notion of development is a problematic one, and its debate has centred around three main discourses namely: Modernisation, Dependency and Human development (Sein & Harindranath, 2004). For many years, the prevalent view of development since the Second World War is focused on modernisation theory of economic growth. From this perspective, gross national product (GNP) or per capita income is used to measure development outcome. To become developed, poor countries need to emulate the rich ones who have utilized the power of technology, the availability of capital, skilled workforce and an entrepreneurial class to achieve growth (Sein & Harindranath, 2004). This development approach determined by economic growth has been adopted by international agencies, national governments and global powers. For example, the World Bank and the International Monetary Fund (IMF) adopted this development approach and promoted it with developmental initiatives in countries under their support (Zheng, 2009). However, this perspective of development has been discredited because it fails to take account of the cultural and local context (Sein & Harindranath, 2004).

The dependency view of development, on the other hand, posit that the process that leads to economic growth and development in developed countries results in the under-development of the poorer countries, mostly formerly colonised countries through debt trap, negative terms of trade and technology-industrial dependency (Akpan, 2003). This view of development inherits a lot from the earlier modernisation perspective and also sees economic growth as one of the main component of development. The dependency perspective has also been discredited for not taking

local and cultural context into account and also putting the onus of development on local government resources rather than the global context (Sein & Harindranath, 2004).

Another approach to development is the alternative approach also known as human development. This approach departs from the generally accepted economist perspective (Modernist and Dependency) to people-centred development. It's a more appropriate conceptualisation of development (Sein & Harindranath, 2004) and a resonance of Amartya Sen's work, which sees development to be concerned with human well-being and freedom. The focus of this perspective is building capabilities (Prakash & De, 2007) and creating societies where the potentials of individuals can be realised (Sein & Harindranath, 2004). This perspective of development is seen from the local level, that is, development is about reducing poverty, increasing educational and health levels, building a society marked by involvement, participation, transparency and better management of behaviour and custom based on better understanding of culture (Soeftestad & Sein, 2003).

However, most IS researchers on ICT for development often explicitly or implicitly take the perspective of development as economic growth and/or modernization (Zheng, 2009). It is in this light, this research seeks to shift from the dominant perspectives (Modernisation and dependency) and explore the value of human development in the discourse of ICT and development. Our work is informed by the concept of human development (HDR, 1990) and a capability approach to the introductions of ICTs (Zheng, 2009; Sen, 1999), which we go on to discuss.

HUMAN DEVELOPMENT

The formal definition of human development presented in the human development report (HDR, 1990) is as follows:

Human development is a process of enlarging people's choices. The most critical of these wide range choices are to live a long and healthy life; to be educated and to have access to resources needed for a decent standard of living. Additional choices include political freedom, guaranteed human rights, and personal self-respect.

The objective of development in this report is to improve human condition by enlarging people's choices. At the same time, the most plentiful resources in developing countries are human beings. Thus, people should be put at the centre of development process. This development approach is more flexible, less dogmatic, and is multi-disciplinary and clearly directed to long-term international goals: sustainability, stability, equity and human rights (Jolly, 2010). The approach has two sides of which must be balanced; first is the formation of capabilities – such as improved health care, knowledge and skills – and second is the use people make of their acquired capabilities – for leisure, productive purpose or being active in social, cultural and political affairs (HDR, 1990).

The human development approach was developed by Amartya Sen and argues that development is the process of expanding the real freedoms that people enjoy to lead the lives they have reason to value (Sen, 1999). It is arguably the most influential challenge to the dominant growth-focused view of development. In Sen's conceptualisation of development, economic growth plays a significant, but not, exclusive role (Kleine, 2010).

While Sen's approach offers a more appropriate view of development, researchers have been struggling to find a balance between its conceptual richness and its potential to be operationalised for development research and practice (Kleine, 2010). This paper constitutes such an effort by using the freedom approach of the capability approach in the social studies of ICT in developing countries.

FRAMEWORK

Theoretical Perspective

The theoretical approach in this paper is informed by the human development perspective which concentrates on people's capabilities, that is, what people are effectively able to do and be. Sen (1999) capability approach is essentially concerned with "freedom", which in a broad sense refers to the effective opportunities people have to live the kind of lives they have reason to value. In his well-known book, *Development as Freedom*, Sen (1999) views the expansion of freedom as both the primary end and the primary means of development. They can be called

respectively the “constitutive role” and the “instrumental role” of freedom in development. The constitutive role of freedom relates to the importance of substantive freedom in enriching human life. The substantive freedom includes elementary capabilities like being able to avoid such deprivations as starvation, under-nourishment, escapable morbidity, premature mortality, as well as the freedoms that are associated with being literate and numerate, enjoying political participation and uncensored speech and so on (Sen, 1999). The instrumental role refers to the means of achieving development and the overall freedom people have to live the way they would like to live.

In this paper, the instrumental role of freedom is drawn upon to assess the social arrangements for accessing electricity and their influences on citizens’ freedom to receive better quality electricity supply. To complement the analysis, the constitutive role of freedom was drawn upon to highlight the people’s capabilities, that is, the opportunities that people have to participate in activities that will yield development.

The capabilities are one of the major constituents of the capability approach alongside vectors of goods and services to which a person has access and functionings, that is, a person’s achievement. In this case, the institutional arrangements to enable citizens have access to electricity are examined in terms of citizens capabilities to benefit from them in a way that expanded their freedoms. Sen (1999) describe five distinct instrumental freedoms that directly or indirectly enhance the capabilities of people:

- Political freedoms: opportunities for people to choose who govern them and on what principles, political expression and uncensored press.
- Economic facilities: opportunities that individuals respectively enjoy to utilise economic resources for the purpose of consumption, or production, or exchange.
- Social opportunities: arrangements the society makes for education, health care and so on, which influence the individual’s substantive freedom to live better. These arrangements are also significant for more effective participation in economic and political activities.

- Transparency guarantees: It deals with the need for openness that people can expect the freedom to deal with one another under guarantees of disclosure and lucidity.
- Protective security: is needed to provide social safety net for preventing the affected population from being reduced to abject misery, and in some cases even starvation and death. It also includes ad hoc arrangements such as famine relief or emergency public employment to generate income for destitute.

According to Sen (1999), these instrumental freedoms supplement one another, and can furthermore reinforce one another. For example, the provision of social opportunities, such as health and education, can enhance people's participation in policy making. In this case, these ideas were adopted to assess the influence of institutional arrangements such as trade union, media, contractors, and market on people's freedom to have access to electricity.

METHODOLOGICAL APPROACH

Research Approach

The interpretive research was adopted in this study (Walsham, 2006) with the aim of understanding the society context of an information system: the social processes by which it is developed and construed by people and through which it influences, and is influenced by its social setting (Oates, 2006). The research is based on a case study method because it enables multiple methods of data collection to gather information from one or a few entities (people, groups, or organisations) (Benbasat et al., 1991). The research was carried out at the headquarters of the Power Holding Company of Nigeria (PHCN), which is in charge of governing the use of electricity in Nigeria. The study was exploratory in nature (Yin, 1994) with the aim of understanding how people's freedom enhance their participation in ICT innovation such that significant lessons can be learned from both policy and decision makers.

Research Method

Data collection was conducted via semi-structured interviews and document analysis. Eighteen face-to-face in-depth interviews were conducted with various key players (see Table 1) in the design and the implementation of the system. Each interview lasted approximately one hour, and was carried out within a month during the research field work.

Participants Interviewed	Reasons
Head of Technical Operations	explore his views of the project at operational and management levels
Five PHCN staff	explore their views based on the direct involvement in the IS implementation
Electrician	to elicit information based on work practices on the IS implementation
Spokesman of the National Union of Electricity Employees (NUEE)	to obtain information on the activities of the union regard the new meter policy
Staff of Contracted firm	explore their views based on the direct involvement in the IS implementation
Eight electricity consumers	to get information about their perspective of the system and ascertain impact

Table 1. Participants interviewed

The participants of the study were selected based on snowballing and convenience sampling (Bryman, 2001). Snowballing sampling is made with a small group of people who are then used to recruit other people and the convenience sampling is making selection based on opportunity (Bryman, 2001). Secondary data were also collected from published documents, PHCN website, and newspaper reports.

Data Analysis

Data collected from interviews and documents were analysed using thematic analysis, a process of encoding qualitative information. The themes and key concepts that were identified were organised into segments: (i) those directly relevant to the research focus (as suggested by the framework for analysis (ii) those providing a broad description of the research context (iii) those not directly suggested by the guiding framework (Oates, 2006). These data provides the case study analysis which is provided in the next section.

CASE STUDY

The Nigeria Context

Nigeria is a developing country in West Africa, and the most populous country in Africa with an approximate population of about 140 million people (NPC, 2006). The country has been under the influence and control of the British until 1960 when it gained its independence. Since then, the country has passed through a series of democratically elected and military regimes with attendant of political, economic and social instability (Uhuegbu, 2004). The different government, military or civilian, have had unstable economic, social and political environments in which to articulate policies.

Every new regime comes with completely new policies. This instability has contributed to the poor infrastructural development and economic growth and its effect on national development can be reflected to poor social arrangements such as power supply, healthcare and education (Mursu et al., 2000), high level of corruption and a low GNI per capital of \$1160 (World Bank, 2009).

However, Nigeria recognises the importance of ICTs in development, and this can be reflected in its National Policy for Information Technology (NNPFIT, 2001). The vision statement in the policy document states: *“to make Nigeria an IT capable country in Africa and a key player in the Information Society by the year 2005, using IT as the engine of sustainable development and*

global competitiveness". The government established the National and Information Technology Development Agency (NITDA) to be in charge of the implementation of this policy.

To achieve the vision, ICTs need to be used in areas of health, education, creation of wealth, poverty eradication, job creation and global competitiveness in order to improve accessibility to public administration for all citizens, bringing transparency to government process within the country (NNPIT, 2001). This paper explores one of those efforts where the Power Holding Company of Nigeria introduced the electricity pre-paid billing meter.

Electricity and the Power Holding Company of Nigeria (PHCN)

Electricity plays a very significant role in the socio-economic and technological development of every country. Uninterrupted power supply is the hallmark of a developed economy. Any country with an epileptic power supply affects her development and risk losing potential investors. It is widely accepted that there is a strong correlation between the availability of electricity and socio-economic development (Sambo, 2008).

The history of electricity production in Nigeria dates back to 1986 when electricity was first produced in the city of Lagos, fifteen years after it was introduced in England (Okoro & Chikuni, 2007). Despite the fact that electricity has existed in the country for over a century now, its development has been at a very slow pace. In 1950, a central body was established by the legislative council that transferred electricity supply and development to the care of the central body known as the Electricity Corporation of Nigeria (ECN), now defunct (Sambo, 2008). Other bodies like Native Authorities and Nigeria Electricity Supply Company (NESCO) have licenses to produce electricity in some areas in Nigeria. There was another body known as the Niger Dams Authority (NDA) established by an act of parliament. The authority was in charge of construction and maintenance of dams and other works on the river Niger and elsewhere, generating electricity by means of water power, improving navigation, and promoting fish brines and irrigation (Okoro & Chikuni, 2007). The electricity produced by NDA was sold to ECN for distribution and sales at utility voltages.

In 1972, the operation of the NDA and the ECN were merged into a new organisation known as the Nigeria Electric Power Authority (NEPA). The reason for the merger was to utilise the effective utilization of the human, financial and other resources available to the power industry throughout the country. For over twenty years prior to 1999, the power sector did not witness substantial investment in infrastructural development (Sambo, 2008). During that period, new plants were not constructed, and the existing ones were not properly maintained, bringing the state of power to a terrible state. In 2001, electricity generation dropped from the installed capacity of 5600MW to an average of about 1750MW, as compared to a load demand of 6000MW (Sambo, 2008). Also, only nineteen out of the seventy-nine installed generating units were operating.

Since the establishment of NEPA, the authority expands yearly in order to meet the ever-increasing demand. Regrettably, the majority of Nigerians have no access to electricity and the supply to those provided is irregular. This is even more chronic in rural areas where the lack of access has negatively affected the local economy and the growth of small industries and business, which would have served as an important source of employment and income (Ikeme & Ebohon, 2005).

In the urban areas, the epileptic and erratic power supply has severely affected the economic expansion resulting in the collapse of businesses who cannot sustain the high cost of maintaining private generating plants, with associated job losses (Ikeme & Ebohon, 2005). The Nigerian experience draws attention to the importance of electricity for economic development especially for a developing country and the prevailing importance of enhancing the operations of the electric power industries if it is to effectively boost the economic development process (Ikeme & Ebohon, 2005).

It is this backdrop that led the federal government to embark on an aggressive power sector reforms with the aim of resuscitating NEPA and making it more effective, efficient and responsive to the growing populace. In 2000, the Nigeria government adopted a holistic approach of restructuring the power sector and privatising the business units of NEPA (Okoro & Chikuni, 2007). NEPA was unbundled into seven generation companies (GenCos), one

transmission company (TransysCo), and eleven distribution companies (Discos). This was done to break NEPA's monopoly and allow the entry of independent power producers (IPPs). In 2004, the structure came into effect to what is called the Power Holding Corporation of Nigeria (PHCN)(Okoro & Chikuni, 2007) and in 2005, the Nigeria electricity regulatory commission (NERC) was established with the responsibility of tariffs regulation and monitoring the quality of services of PHCN (NERC, 2009).

A major problem faced by PHCN was how to collect its revenue. Electricity consumers both individuals and corporate organisations had always evaded paying their electricity bills causing PHCN being indebted billions of naira. This drove PHCN to adopt alternative methods of collecting revenues. Before the introduction of the pre-paid billing meter, PHCN were using the analogue electric billing and fixed billing meter. With the analogue billing meter, the meter records the amount of power consumed, after which a bill is sent to the consumer for payment. However, PHCN officials do not consistently record monthly meter readings. Hence, some consumers do not receive their bills at the appropriate time while some receive over-estimated bills that they find difficult to pay for. Another group of consumers that do not own meters get monthly fixed bills without regards to how much electricity they consume in a month. Due to the poor satisfaction as a result of PHCN inefficiency, some frustrated consumers go as far as illegal connections to get power. Some even leave their electrical appliances switched on even when not in use. This is done in order to compensate themselves for the high billing rate and sporadic power supply.

Due to the huge debt owed by consumers, PHCN introduced a cash collection policy called Revenue Cycle management (RCM) that involves using private organizations such as designated banks in the collection of money paid. The consumers were expected to pay their bills at their banks. This was to facilitate regular and prompt payment of bills, as consumers needed not to travel far outside their area searching for PHCN offices to settle their outstanding bills. During that time, the presentation of a NEPA bill was a condition you must satisfy in order to open a bank account. However, many still claimed they were too occupied to visit the banks in order to settle their bills. PHCN carried out an aggressive media campaign to persuade consumers to pay

their bills-through television, radio, and billboards. However, this did not yield the expected result; hence the pre-paid billing meter was introduced in 2006.

Discussion and Analysis

Sen's five instrumental freedoms are used throughout the case study analysis to discuss the institutional arrangement supporting the introduction of the prepaid billing meter. The constitutive role of freedom was referred to in order to explain the issues surrounding the human developmental impact of ICT.

Economic Resources

In this study, the locals could benefit from this arrangement in form of temporary employment and wages in return for supporting PHCN operations during the installation of the pre-paid meters. Ad hoc electricians, comprising of local citizens were employed to support PHCN operations throughout the country. However, this arrangement caused some concerns for the electricians. According to the spokesman of the National Union of Electricity employees (NUEE):

“The contractor in charge is not paying the electricians their wages for the installation of these meters. We are going on strike to show our dissatisfaction”

The situation described above reveals a major issue affecting the conduct of economic activities in the country. There is absence of sincerity, which is a critical condition for conducting business in most countries. The contractors were depriving the electricians their wages as a result of insincerity. The unpaid electricians embarked on a strike, which resulted in the suspension of the meter installation for about a month before the matter was resolved. Hence, the freedom to exchange material is a key requirement for economic development process but there is need to operate within a level of openness and trust. In our case, the lack of openness and sincerity had negative consequences on the human developmental impact of ICT.

Social Opportunities

The PHCN case benefitted from this form of arrangement, as there was a significant level of activities as regards to social opportunities. There were significant efforts made to educate the consumers on the usage of the prepaid billing systems and its benefit. Other various campaigns were used to create awareness of the new system through the use of media such as poster, billboards, radio and television. The media campaigns were successful in prompting citizens to exercise their right to access to electricity. Locals were also educated and trained to help PHCN officials in the installation of the prepaid billing meters. However, this arrangement caused some major concerns for contractors:

“Most of these local electricians we trained are making illegal connections for consumers by collecting bribe” (Contractor)

The situation above describes a major capability deficit affecting developing countries. The high level of poverty in the country causes corruption and other illicit activities. Hence, some people saw an opportunity to take advantage of PHCN ineffective monitoring mechanisms by making illegal connections, and earning money, albeit fraudulently. On knowing about these shady activities, the contractors lay off most of the locals and used only their own electricians. Thus, the capability deficit mentioned above had implication for social opportunities which in turn affected the human developmental impact of the pre-paid billing system.

Transparency Guarantees

In this study, the prepaid billing meter was designed in such a way that consumer's could see the amount of electricity they have consumed. Prior to the introduction of the prepaid billing meter, PHCN officials normally visit every consumer's house, read their meter and send them their bill. Sometimes, these bills are over estimated and sent to the consumers. But, with the prepaid system, consumers no longer feel cheated as they pay for only the energy they have consumed, thus they pay their bills regularly. However, the new pre-paid billing system was also a cause of concern. There were complaints by consumers that the new system has introduced another way of money extortion from the consumers.

It was also reported by some of the respondents that PHCN officials are reluctant to install the pre-paid meters because it has blocked one of the lucrative avenues of making illegal money. Hence, if consumers want to get the meter installed, they needed to pay a large sum of bribe to get the new meter or they will have to continue with the analogue meter. As noted earlier, Nigeria is a country with high level of poverty and as a result people look for ways of earning money either legally or illegally. Thus in this case, these illegal activities led to increase mistrust of PHCN officials and the prepaid billing system as well, which in return negatively affect people's willingness to use it.

Protective Security

In this study, the prepaid electricity billing system benefitted from this arrangement. PHCN provided an emergency office in every state in the country which operates 24 hours a week so that people could top up their prepaid meters in the middle of the night and weekends. However, this arrangement caused some concerns for some citizens. For example, some citizens were left without electricity in their homes in the weekend because they were unable to top up their meters due to the closure of the emergency office in some particular areas. Others were unable to conduct their business as shown in this quote:

"Because I can't recharge my meter, I am out of business and I am financially handicap at the moment (Ice-Cream seller)

In Nigeria, majority of the populace do not work on weekends because they see it as the only time they have to spend with their families and rest from the efforts made during working days. Secondly, the PHCN officials assigned to work on weekends were not paid extra for their work done because they already had a fixed monthly salary.

From a constitutive freedom perspective, the closure of the emergency office negatively affected the citizens in those particular areas. This constraint peoples agency as seen in the case of the citizen who was unable to conduct his business. Hence, the non-payment of PHCN officials to

work on weekends and the closure of the emergency offices had negative consequences of the developmental impact of the prepaid electricity system.

Political participations

None of the stakeholders from the demand side were included in the requirements and design of the pre-paid meter. Many of the respondents interviewed noted that, they have never heard of the new meter until PHCN announced on the radio and television that the analogue meter was going to be replaced with the prepaid meter. The stakeholders from the supply side such as Government, PHCN and the contracted firms were the only ones in charge of the entire design and implementation of the system. When asked concerning this issue, the Administrative officer of PHCN stated:

“During the system demonstration forum which involved all stakeholders, there was a lot of conflicts and disagreement concerning the system that was too much to handle. As a result we didn’t want to involve the members of the public, because we felt there would be increase in conflict and disagreement which could slow the system design and implementation”

However, in a constitutive sense, a Nigeria citizen hardly has the freedom required to exercise their agency in this manner. The conflict and disagreement mentioned by the administrative officer was as a result of the resistance towards the new prepaid meter by some PHCN officials. It was reported that the reason for the resistance was because it reduced some of the PHCN staff’s authority and control. Hence, in this study, the discussion above shows that political expression may be used negatively as seen with the stakeholder’s resistance of the system.

Conclusion

In this paper the authors examined the development impact of ICT projects by concentrating on the introduction of the prepaid electricity billing system in Nigeria and the supporting arrangements to enable citizens have access to electricity supply. The study was informed by Sen (1999) capability approach, which was used to highlight the extent to which the prepaid electricity system contributed to enhancing people's freedom to participate in developmental activities and then derived some implications on economic development.

Our analysis shows that the institutional arrangements were sufficient for the introduction of the system but inadequate to achieve the development potentials. The key capability deprivations that were identified in the study are lack of transparency and corruption, high rate of poverty, and the lack of citizen's participation. These issues adversely affected the developmental impact of the pre-paid billing meter.

In suggesting the potential for future research, the limitation of this study is recognised. The study was limited in that only a single focused case study was undertaken under severe time limitations, however there is scope for undertaking a longitudinal study on the basis of current result to further provide more insight on developmental issues as the country continues to expand the implementation of the prepaid electricity billing meter. The findings of the study cannot be generalised, however, the concepts can be developed further and explored in similar research settings.

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