Investigating the Link between ICT Intervention and Human Development using the Capability Approach: A Case Study of the Computerised Electricity Management System

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Submitted as partial fulfilment of the Requirement of

Doctor of Philosophy (Ph.D)

School of Information Systems, Mathematics and Computing

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West London

October 2012

DEDICATION

To Almighty Allah, my family, my friends, my country and humanity

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ACKNOWLEDGEMENT

First and foremost, I remain forever thankful and grateful to my supervisor, Dr Pamela Abbott, for providing me with guidance, support and criticism and for patiently and meticulously reading my thesis. This journey would definitely not have been completed without her enduring professional guidance. I would also like to thank Dr Anastasia Papazafeiropoulous and Dr Laurence Brooks for their contributions, encouragements and criticisms during the course of my study. I also use this opportunity to say thank you to all the Rubicon members for their support and encouragement. I would also like to say thank you to my Uncle, Mansir Nakande, for making the data collection possible by providing me with permission and support to conduct my research in his organisation. My appreciation is extended to include all interviewees who facilitated the research process by contributing to my data collection. I am grateful to all the people in the School of Information Systems and Computing for the support and encouragement I received during my time of study. Finally, to my family, especially my dad, mum, brothers, sisters and friends, thank you for the love, care, understanding and the belief you have provided to me.

To Almighty Allah, thank you for this life opportunity.

Salihu Ibrahim Dasuki

LIST OF PUBLICATIONS

Journals

Ibrahim-Dasuki, Salihu; Abbott, Pamela; and Kashefi, Armin (2012) "The Impact of ICT Investments on Development Using the Capability Approach: The case of the Nigerian Pre-paid Electricity Billing System," *The African Journal of Information Systems* –

A link to this paper has further been provided to the United Nations Asian and Pacific Training Centre for Information and Communication Technology for Development. http://www.unapcict.org/ecohub/the-impact-of-ict-investment-on-development-using-the-capability-approach-the-case-of-the-nigerian-pre-paid-electricity-billing-system

Ibrahim-Dasuki, Salihu; Abbott, Pamela (Accepted) "ICT And Empowerment To Participate: A Capability Approach"*, Information Development*.

Conferences

Ibrahim-Dasuki, Salihu; Abbott, Pamela (2011) "Evaluating the Effect of ICTs on Development Using the Capability Approach: The case of the Nigerian Pre-paid Electricity Billing*",* Proceedings of SIG GlobDev Third Annual Workshop, Saint Louis, USA December 12, 2010.

Ibrahim-Dasuki, Salihu; Abbott, Pamela (2011) "ICT and Empowerment to Participate: A Capability Approach" in the Proceedings of AMCIS conference, Detroit, Michigan.

Panagiotopoulos, P; Brooks, L; Elliman, T; Ibrahim-Dasuki, S (2011) "Social networking for membership engagement in non-profit organisations: a trade union study" in the Proceedings of AMCIS conference, Detroit, Michigan.

Ibrahim-Dasuki, Salihu; Abbott, Pamela (2011) "The Impact of ICT Investments on Development: Lessons from the Nigeria Pre-Paid Electricity Billing System", 9th International Conference on Social Implications of Computers in Developing Countries, Kathmandu, Nepal

ABSTRACT

There has been an increasing amount of investment in Information and Communication Technologies for Development (ICT4D) interventions in developing countries under the premise of accelerating the process of social, economic and political development. These interventions are usually driven by the symbolic power of ICTs which signify progress and upon which the governments of developing countries try to draw to modernise the functioning of the state and to further enhance public service delivery to citizens. However, in this thesis it is argued that the actions and events that lead to the design and implementation of ICT4D tend to be politically motivated because ICT4D are simply interventions used by powerful actors and institutions to achieve their goals. These powerful actors include international donor agencies, politicians, top bureaucrats and private entities. In addition, it is argued that, due to these politically motivated agendas, ICT4D projects tend to be implemented in a top-down fashion and within an economic development perspective that appears to isolate the concerns of the country itself and the wellbeing of its citizens.

In an attempt to try and redress social exclusion and imbalance, the capability approach drawn from the work of Amartya Sen (1999) stresses the enhancement of human capabilities and the moral aspects of development. Theoretically, the study is based on the key concepts of Sen's Capability Approach. However, Lukes's (1974) concepts of power are also drawn upon to address the limitation of the capability approach in addressing the concept of power. The research questions guiding this thesis are as follows: (1) How do the underlying motivations of different actors drive the design and implementation of ICT4D initiatives in developing countries? (2) How can researchers usefully conceptualise the relationship between ICT and development given the complexities in which ICT4D initiatives are undertaken?

What conceptual framework could help theorise the complex relationship between ICT and development? Epistemologically, the study was conducted by following an interpretive research approach. The research was carried out in two states of Nigeria, Abuja and Plateau, and took place during the period of 2010-2011. The case-study centres on the initiation and

implementation of the Computerised Electricity Management System (CEMS). Empirically, data collection techniques include 65 individual interviews, field observations and document analysis.

The following are key findings of this thesis:

ICT4D interventions are a complex process shaped at two levels. At the international level, they are shaped by donor agendas such as privatisation, and at the national or local level they are shaped by political and private interests. These agendas and interest are driven by powerful actors such as international donor agencies that often impose such interventions as a condition of aid, politicians who often use such interventions as campaign tools, and other top public and private actors who often use such interventions for personal gain. Hence, the beneficiaries of these projects usually have no say in the design of ICT4D projects but are rather forced to accept these interventions.

Corruption is a major obstacle that hinders the expected ICT4D contributions in terms of individual opportunities and freedoms of living better lives inscribed in ICT4D interventions. Corruption exists as a *"network"* involving different actors present at three levels of ICT4D projects, namely the design, implementation and usage stages. Viewed from this perspective, the findings of this study show that international donor agencies, politicians, public bureaucrats and private entities are equally responsible for promoting corrupt practices in the context of ICT4D interventions. Theoretically, this thesis progresses the operationalisation of the capability approach (CA) by encapsulating the central aspect of the approach and Lukes's (1974) concept of power. This is an innovative way of operationalising the capability approach by addressing its limitations in explaining the notion of power; the study thereby contributes to the field of IS using the capability approach and expanding the scope of theoretical analysis of contemporary ICT4D studies.

Practically, to make the relationship between ICT and development more effective in meeting broader development goals, it is necessary for government policies to move beyond the mere provision of technology to also concentrate on the cultural, institutional, social and political aspects in ensuring the effective use of ICT resources, which should serve

to improve people's opportunity to participate more in social, political and economic activities.

ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
AGIS	Abuja Geographic Information System
ADB	Asian Development Bank
ATU	Anti-corruption and Transparency Unit
CA	Capability Approach
CIA	Central Intelligence Agency
CCI	Control and Corruption Index
CEMS	Computerised Electricity Management System
DOI	Diffusion of Innovation
DC	Developing Countries
DFID	Department for International Development (DFID)
DotForce	Digital Opportunity Task Force
ECA	Economic Commission for Africa
E-government	Electronic Government
EFCC	Economic and Financial Crimes Commission
EMR	Electronic Medical Record
F-HMIS	Free Health Management Information Systems
FAO	Food and Agriculture Organisation
FEC	Federal Executive Council
FOSS	Free and Open Source Software
G8	Group of Eight
GNP	Gross National Product
HDI	Human Development Index
HIV	Human Immune Virus
HMIS	Health Management Information Systems
IFAD	International Fund for Agricultural Development
IFMIS	Integrated Financial Management Information System
ICT	Information and Communication Technologies
ILO	International Labour Organisation
IMF	International Monetary Fund
IS	Information Systems
IT	Information Technology
ITU	International Telecommunication Union
ICT4D	Information Technology for Development
LOC	Library of Congress
MDG	Millennium Development Goals
MOU	Memorandum of Understanding
NEPA	National Electric Power Authority
NERC	Nigerian Electricity Regulatory Commission
NPFIT	Nigeria Policy for Information Technology
NITDA	*National Information Technology Development Agency*
NUEE	National Union of Electricity Employees
OECD	Organisation for Economic Co-operation and Development
PIN	Personal Identification Number
PHCN	Power Holding Company of Nigeria
PRSP	Poverty Reduction Strategy Papers

RCM   Revenue Cycle Management
REA   Rural Electrification Agency
RTC   Right to Communication
SEEDS   State Economic Empowerment Development Strategy
SLA   Sustainable Livelihood Approach
SSA   Sub-Saharan Africa
TAM   Technology Acceptance Model
UN   United National
UNCTAD   United Nations Conference on Trade and Development
UNDP   United Nation Development Program
UNESCO   United Nations Educational, Scientific and Cultural Organization
UTAUT   Unified Theory of Acceptance and Use of Technology
VAO   Village Administration Officer
WB   World Bank
WCED   World Commission on Environment and Development
WSIS   World Summit on the Information Society

CHAPTER ONE – SCOPE OF RESEARCH

1. Introduction

"Information and communication technologies have a central role to play in the quest for
development, dignity and peace."
- Ban Ki-moon, United Nations Secretary-General

1.1. Scope of Research Area

Recently, the relationship between ICT and development has been the centre of several studies in the information and communication technologies for development (ICT4D) domain. This study focuses on understanding how ICT4D interventions can enhance human wellbeing in developing countries. Particularly, the research attempts to link the potentials of ICT4D with human development. In this study, development is viewed as the expansion of human capabilities (Sen, 1999). The study is theoretically based on Sen's (1999) capability approach and empirically conducted in Nigeria. The motivation for this research arises from the fact that ICT4D is widely promoted as a development enabler in a developing-country context; however, evidence showing its contribution to improving the livelihoods of the poorer communities is yet to be ascertained (Avgerou, 2003; Akpan, 2003; Wade, 2002).

The term ICT4D refers to the use of ICTs by governments and donor agencies to support economic development. The relationship between ICT and development is a well-debated topic. There is an optimistic camp that says ICT will lead unproblematically to rapid economic development. Members of this camp suggest the facilitation of market mechanisms (e.g. deregulation, structural reforms, and privatisation) as the means of achieving economic growth in developing countries (UNDP, 2001). The more critical camp, on the other hand, suggests that ICT4D needs to shift from market-driven economic reasoning to consideration of the social conditions that sustain development (Avgerou, 2003), avoiding the view of ICT as a *'silver bullet'* for development (Walsham, 2010). This perspective suggests that the means of achieving poverty alleviation lie with improvement of basic healthcare and education infrastructure (Ngwenyama et al., 2006) and reforms of government and bureaucratic structures (Ciborra and Navarra, 2005).

However, Sein and Harindranath (2004) note that the ambiguous findings and diverse opinions from the two camps are due to a lack of conceptual clarity on the role of ICT in national development. They suggest that ICT needs to be conceptualised in its many facets and perceptions and its manifold impacts on societies. Walsham and Sahay (2006) argue further that ICT is deeply implicated in the approaches we adopt in the name of *'development'.* In this light, Prakash and De (2007) noted that the notions of development influence the choice of technology design and usage, and unless these notions are consistent with the contextual dimensions, their desired consequences might not ensue.

Furthermore, the belief in the superiority of scientific and technical knowledge over indigenous knowledge and traditional practices persists (Puri and Sahay, 2007). This makes developmental initiatives problematic in the long run. This may be the result of ill-formulated intervention strategies that guide development (Soeftestad and Sein, 2003), or the scant consideration given to the local factors that affect implementation and usage of systems when they are shaped in the context of more advanced nations (Maumbe, Owei and Alexander, 2008). Decades of research examining the role of ICT4D reveals that technology has failed to achieve its intended purposes (Heeks, 2002; Soeftestad and Sein, 2003) and there is not yet evidence to show that investments in ICT lead to economic growth and improvement of basic needs in developing countries (Avgerou, 2003; Akpan, 2003). This has led Walsham, Robey and Sahay (2007) to call for more emphasis on the aspect of the development being pursued. Given the existence of a complex and ambiguous link between ICTs and development, this research explores this link using the human development approach, also known as Sen's (1999) *"capability* approach".

Sen's conceptualisation of development has had a significant impact on the policy-making of the United National Development Programme UNDP (Gasper, 2002) and enables one to assess how individuals can utilise the available options or commodities in order to live better lives. Hence, evaluating the development potential that ICT interventions can offer in developing countries fundamentally involves theorising the linkage between ICTs and development.

1.2.   Research Motivation

Geographically, Nigeria exhibits a wide gap in economic and social development, with a major concentration of economic activities in the capital city, Abuja, and other urban cities. The country's social and economic developments have been faced with challenges arising from past colonial rule, civil war, and military rule. Furthermore, there have been other human-made challenges arising from the present democratic dispensation. With such a complex historical context, investigating the relationship between ICT and development is indeed a deep research challenge. The improvement of the citizen's wellbeing in Nigeria has always been the main national policy goal. However, achieving this goal has always been an enormous and complex task, as it involves many interrelated social features, including that of ICT4D which is the focal point of this study. Theoretically, the development aspects that characterized many ICT4D interventions have often been ignored; rather, the majority of academic research on the evaluation of ICT4D projects has clustered around design, transfer and implementation issues (Bhatnagar and Singh, 2010).

These studies 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). In addition, the moral implications as inscribed in Sen's view of development are barely discussed. On the basis of the literature in Information Systems (IS) research, however, all IS can be seen as socio-technical systems, combining not only the technical considerations but also the social side. Hence, in this thesis I empirically and theoretically seek to understand the complex relationship between ICT and development and how this can better inform policy-making related to areas in which ICT can serve more strategic and broader development goals. Also, this study seeks to address a significant research need in developing countries by studying ICT interventions in developing countries and their implications for development.

Finally, it seeks to understand the contributions of ICT to development - as opposed to what happens to ICT when it is deployed in the context of developing countries. The study follows the suggestion of Walsham (2010) on the use of the concept of development from Sen's (1999) capability approach as a possible theoretical lens for revealing the meaning of development and how ICTs can contribute to improving individual wellbeing.

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1.3.   Research Question and Objective

This research is informed by an underlying assumption that ICT4D can contribute to development if its focus is on providing opportunities that citizens can effectively use to improve their wellbeing. This underlying assumption leads to the following research objectives:

- To carry out an empirical study to investigate the rationale and process of the initiation and implementation of an ICT4D initiative in Nigeria. This includes identifying the major opportunities and impediments in the process of ICT4D design and implementation in the case-study context.

- To conduct a theoretical and empirical analysis using key concepts of human development to better understand the relationship between ICTs and development.

The research objectives lead to the following research questions:

- How do the underlying motivations of different actors drive the design and implementation of ICT4D initiatives in developing countries?

- How can researchers usefully conceptualise the relationship between ICT and development given the complexities in which ICT4D initiatives are undertaken?

1.4.   Research Approach

To address the above research aims, an empirical investigation was conducted to understand the involved actors, structures, agencies, dynamics and challenges of the process of initiation and implementation of ICT4D intervention in Nigeria. A broadly interpretive approach was adopted in this study (Walsham, 2006) with the aim of understanding the social context of an IS in use, i. e. 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 study was carried out during the period 2010-2011 through a single interpretive case-study design approach. The research was carried out at the distribution zone 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, 2003) with the aim of understanding how ICT innovations contribute to the enhancement of people's capabilities such that significant lessons can be learned for both policy- and

decision-makers. Data collection was conducted via semi-structured interviews, field observations and document analyses. Thematic analysis, which is a method of organising and describing data sets in rich detail by identifying, analysing and reporting patterns referred to as themes, was used to analyse the data (Braun and Clark, 2006; Boyatzis, 1998).

1.5.   Theoretical Approach

The thesis is theoretically based upon Sen's conceptualisation of development, commonly known as the *"the capability approach"* (Sen, 1999). Development, in Sen's view, is the process of expanding human freedoms, and the assessment of development has to be informed by this consideration. Sen emphasises individual *"capabilities"*, which is the freedom an individual has to live the life he or she has reason to value. Individual freedoms are the different choices in life that one has in deciding which path of life to follow. Sen argues that development interventions should focus on providing opportunities that enhance an individual's freedoms and capabilities, rather than on the dominant economic or utilitarian aim of enhancing personal wealth and income, which is nonetheless significant. The potential of the capability approach lies in its focus on human beings and their quality of life. In the domain of ICT4D, the capability approach has the potential to support the evaluation not only of the technical aspects but also of the social constituents that ICT4D can provide for human wellbeing (Zheng and Walsham, 2008; Madon, 2004; De, 2006).

1.6.   Expected Contribution

This research envisages contributing theoretically and practically to the research domain of IS in developing countries, specifically relating to:

- Expanding the scope of contemporary ICT4D analysis based on the capability approach
- Contributing to the debates on the theorization and evaluation of ICT for development
- Drawing implications for the implementation of ICT4D interventions in developing countries, which can help managers, practitioners and politicians engaged in the process of implementing these projects better understand how ICT4D can practically contribute to improving the lives of the poor.

1.7.   Research Overview and Structure

The structures of the chapters are organised as follows:

Chapter two begins with an overview of ICT4D followed by a review of the literature in the ICT4D domain. The literature review focuses on key dimensions of ICT4D literature that have influenced this study: the relationship between ICTs and development, the development and corruption discourse, the roles of ICTs in enhancing transparency, and ICT4D and actors. Following a discussion on the critique of the ICT4D domain and gaps in the literature, the chapter concludes with the formulation of the research questions informing this study. Hence, the literature review has helped us to identify areas to which this study might contribute.

Chapter three discusses the different conceptual frameworks that have been applied in ICT4D research. A discussion of these different frameworks reveals the capability approach as the most appropriate framework to help answer the research questions. The other frameworks highlighted the relevance of socio-technical approaches in ICT4D projects. There follows a discussion on the capability approach as a concept framework and how different authors have applied it in the domain of ICT4D research. The chapter concludes by discussing how the framework will be applied differently and what elements of the capability approach will be used in this study. The discussion of the capability approach on the one hand, and the examination of ICT4D studies that have used the capability approach on the other, helped in identifying the limitations of the framework and how this study can contribute by operationalising it differently.

Chapter four is devoted to describing the philosophical assumptions underpinning the study, particularly the epistemological assumptions of interpretive research. The main strategy adopted for studying the contribution of ICTs to development was an in-depth case-study. The methodologies and methods used in conducting case-studies were discussed. The work examined in this chapter showed how insightful an interpretive approach can be in studying the development aspect of ICT4D interventions. The chapter concludes by discussing the challenges associated with operationalizing the capability approach and the mode of analysis for the data collected.

Chapter five is concerned with the focal case-study. It introduces the social and historical background of the research context, greater details of the case-study, which is the computerised electricity management system, and the research findings. Chapter six presents a thematic analysis of the research findings followed by a critical discussion based on the key elements of the capability approach, which served as the theoretical framework. The results of these analyses are interesting in that they allowed us to understand not only the politics of ICT4D projects and the different manoeuvres and tactics deployed by powerful actors to drive the implementation of ICT projects but also the context of the project and what conditions were enabling or constraining citizens in transforming the ICT4D intervention into valued activities that might enhance their development.

Chapter seven discusses and examines the implications of the case analysis for three interrelated issues which are linked to the theoretical framework. The thesis concludes in chapter eight by discussing the contribution of the research to both theory and practice. The chapter also reports on the implications of the research approach and the adequacy of the theoretical framework. The chapter and the thesis conclude with suggestions for future research to progress the field of knowledge in the ICT4D domain.

CHAPTER TWO – LITERATURE REVIEW

"There can be no development without peace and there will only be slow development without ICTs. Hence, the need to understand and use ICTs appropriately and meaningfully to meet the Millennium Development Goals and Targets"

-Usha Rani Vyasulu Reddi, Professor in Education and Director of the Centre for Human Development, Administrative Staff College of India

2. Introduction to Information and Communication Technologies for Development (ICT4D)

This chapter begins by providing a brief history and overview of ICT4D, an area of study with which this research aligns itself. After this brief overview, a review section is introduced to provide an overview of the literature on ICT4D research. As the study also touches on development discourse, the subsequent sections provide an overview of the concept of development and corruption and its relevant critiques. After this, the next section discusses the relationship between ICTs and development and also the role of ICTs in enhancing transparency and accountability. The section following discusses the critique of ICT4D and concludes the chapter by recognising the gaps in the ICT4D literature that guide the focal point of this study and formulation of the research questions.

2.1 Overview of ICT4D

For the purpose of this study, the term *"ICT"* is defined as:

'a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. They include the "old" ICTs of radio, television and telephone, and the "new" ICTs of computers, satellite and wireless technology and the Internet. These different tools are now able to work together, and combine to form our "networked world" - a massive infrastructure of interconnected telephone services, standardized computing hardware, the Internet, radio and television, which reaches into every corner of the globe' (UNDP, 2001a, pg. 2). Various enabling features of ICTs make them potentially beneficial for development especially in the public sectors such as education, health, agriculture, governance, trade and community development. The significance of ICT for development came to the forefront of policy issues in 1980 during the

commissioning of the report *"Many Voices, One World"* by the United Nations Educational, Scientific and Cultural Organization (UNESCO, 1980). This report, also referred to as the *"McBride Report",* called for a more equitable resource allocation particularly in the area of communication.

Later on, in the mid-80s, the Food and Agriculture Organisation (FAO), United Nations agencies, and the International Telecommunications Union (ITU) further raised the issue of inadequate telecommunication infrastructure as an obstacle impeding economic growth in developing countries. Furthermore, the commissioning of the "*Maitland Report*", also known as *"The Missing Link: Report of The Independent Commission for World Wide Telecommunications Development",* by ITU in 1984 saw the notion of development elevated as a top-priority agenda (ITU, 1984). In so doing, the ITU established a separate body *"Centre for Telecommunications Development*" to deal with development matters. In July 2000, the Group of Eight (G8) recognised the increasing importance of utilising technology in the area of equitable development by announcing that *"everyone, everywhere should be enabled to participate in and no one should be excluded from the benefits of the global information society"* (pg. 1). This declaration was made during the summit of the Okinawa Charter on the Global Information Society, thus positioning ICT4D as a vital development area for policy-makers such as governments and donor agencies. The success of the Okinawa Charter on Global Information Society further resulted in the creation of the Digital Opportunity Task Force in 2001.

The Task Force commissioned the report known as *"Digital Opportunities for All"* comprising five major development areas – improving connectivity, building human capacity, formation of national ICT strategies, integration of ICT in donor development aids and support for local entrepreneurs (DOTForce, 2001). In the same year, the United Nations Development Programme (UNDP) produced the report *"Making New Technologies Work for Human Development"* which particularly focused on the importance of harnessing ICTs for sustainable development. Subsequently the World Summit on Information Society (WSIS) in 2005 produced the *"Tunis Agenda for the Information Society"* report which linked ICTs to

the Millennium Development Goals (MDGs)[1] by emphasising its role as a development enabler, as shown in the quote below:

 "*We agree that the financing of ICT for development needs to be placed in the context of the growing importance of the role of ICTs, not only as a medium of communication, but also as a development enabler and as a tool for the achievement of the internationally agreed development goals and objectives, including the Millennium Development Goals*" (WSIS, 2005, pg. 2).

To support this statement, the UNDP's 2007 *"Making Globalization Work for All"* annual report highlighted the link between low internet access, low foreign direct investment and lack of integration in the developing countries (UNDP, 2007). Since the 1990s, there has been a major attempt by donor agencies to accelerate the adoption of ICTs, such as community telecentres, with particular focus on the number of people with access to the Internet in rural communities in the developing countries. Pilot projects were implemented but were often left with inadequate funding, thus affecting their sustainability and scalability even though such projects form part of the WSIS (2003) policy agenda aiming to establish community access points to connect the marginalised poor with ICTs. Several international and national donor organisations have devoted vast amounts of resources to projects of this nature (UNCTAD, 2007) with the assumption that they are powerful tools that will ultimately improve the livelihoods of the community by providing people with economic opportunities, social participation, empowerment and education. However, the extent to which these perceived development gains have been realised is still a moot point.

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[1] The Millennium Development Goals (MDGs) comprise eight internationally agreed goals set by all 193 United Nations Member States and at least 23 international organisations to be achieved by the year 2015. The goals are: (1) eradicating extreme poverty and hunger; (2) achieving universal primary education; (3) promoting gender equality and empowering women; (4) reducing child mortality rates; (5) improving maternal rates; (6) combating HIV/AIDS, malaria, and other diseases; (7) ensuring environmental sustainability: and (8) developing a global partnership for development.

2.2 Review of ICT4D Literature

ICT4D is a dynamic, multi-dimensional and multidisciplinary research domain that situates itself at the intersection of social, political, economic and technical perspectives. It is immensely concerned with the deployment and use of ICTs in developing countries by individuals, businesses, communities and governments. This review section provides a summary of the current body of knowledge by briefly discussing the context and background of a wide range of publications relating to ICT4D, concentrating more on the issues that are of importance to the areas explored in this research.In the absence of a chosen or preferred research paradigm, ICT4D researchers have adapted various conceptual frameworks and methodologies and a diverse range of epistemological stances. The ICT4D domain consists of a wide and voluminous body of literature, and at least thirteen journals have a specific ICT4D focus, as identified by Heeks (2010) in his ranking of ICT4D journals[2].

The multidisciplinary nature of this study and ICT4D in general, which can be seen to overlap between the fields of developmental studies, engineering, information systems, media, political science, communication, sociology and so on, makes it a challenging task to limit the literature review to a particular discipline while at the same time keeping it within reasonable boundaries. The majority of the ICT4D studies can be categorised into many different themes, with some focusing on its role, use and impact on the various areas of development (Walsham and Sahay, 2006; De and Ratan, 2009) . Like the general IS literature, there have been varying degrees of classification of ICT4D literature by different researchers. For example, Sein and Harindranath (2004) classified ICT4D based on its different conceptualisations: how it is viewed, how it is used and its subsequent impacts. Jagun et al. (2008), on the other hand, identified two sets of ICT4D research: the *"upstream"* studies which examine the macro level environment such as ICT-related strategies and policies; and the *"downstream"* studies which focus on the micro level analyses such as usage and impacts.

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[2] Heeks (2010) ICT4D Journal Ranking, http://ict4dblog.wordpress.com/2010/04/14/ict4d-journal-ranking-table/

Instead of using an existing categorisation, this section begins by briefly discussing the various reviews of the body of knowledge in the domain of ICT4D conducted by several researchers. An overview of adoption and diffusion of ICT4D studies follows before an exploration of the literature dealing with ICT4D and actors and the impacts of ICT on economic and human development. The subsequent section discusses the role of ICT in enhancing transparency and accountability and the notion of corruption as a barrier to achieving this goal and then concludes by pointing out some critiques of the notion of ICT4D.

2.2.1   Reviews of the Current Landscape of ICT4D Literature

There have been few publications aimed at summarising the body of knowledge in the ICT4D research domain, sometimes with an emphasis on particular aspects. For example, Avgerou (2010) reviews the multidisciplinary literature on ICT4D and identifies two key themes regarding the nature of the ICT innovation process in developing countries - as transfer and diffusion and as socially embedded action - and two perspectives on the development transformation towards which ICT is understood to contribute - progressive transformation and disruptive transformation. Walsham and Sahay (2006) present an analysis of research articles published from 2000 onwards and categorise them in terms of the key issues addressed, including the role of ICTs and the theoretical and methodological approaches adapted. In an analysis of ICT4D literature with a particular focus on India, Walsham (2010) categorises these studies in terms of their contribution to development using Sen's instrumental freedoms. A literature review by Ndou (2004) focused on the primary issues, opportunities and challenges that ICT4D initiatives present for developing countries.

Donner (2008) presents a review of about 200 recent studies focusing on the use of mobile phones in developing countries. His paper classifies these studies into two major dimensions. The first dimension distinguishes studies that concentrate on the relationships between mobile technologies and users from those focused on the determinants of mobile adoption, and from those that assess the impacts of mobile use. The second dimension presents a subset of studies with a strong economic development perspective. Focusing on the role of the electronic medical record (EMR) in healthcare delivery development in

developing countries, Williams and Boren (2008) conducted a systematic review to examine the benefits of EMR and its contribution to the development of healthcare delivery in developing countries. Finally, Thompson and Walsham's (2010) literature review identifies four strategic dimensions where ICT arguably has potential as a significant enabler for transformational development in Africa: institutional infrastructure; governance, accountability and civil society; service production and economic activity; and access to global markets and resources.

2.2.2   Adoption and Diffusion of ICT4D Innovations

Other research on ICT and developing countries recognises and acknowledges the difference in contexts. These researchers argue that information systems created within and for a developed-country context and transferred to a developing country are likely to fail due to the difference in physical, social, economic and political contexts (see Heeks, 2002). Two different ways of addressing issues of context in ICT in developing-countries research can be in terms of either "*socially embedded*" processes or "*transfer and diffusion*" processes (Avgerou, 2008). Drawing on Roger's (1995) *"diffusion of innovations approach",* Orlikowski and Iacono (2001) identify this classic framework as a common theme in technology research. This framework has been applied and tested in different contextual settings and mobile applications, including mobile banking applications in South Africa (Brown et al., 2003) and m-commerce in Thailand (Kini and Thanarithiporn, 2004). Along related methodological lines, other studies have adopted a quantitative approach using the Technology Acceptance Model (TAM) to explain and predict mobile adoption in Nigeria and Kenya (Meso et al., 2005).

Bada's (2002) study on an ICT-driven change project in the Nigeria banking sector highlights the need for more work in understanding the local contextual practices into which global ICT-based practices are being implemented. The transfer and diffusion viewpoint assumes ICT innovations in developing countries to be a process of knowledge diffusion, which is transferred from a developed-country context and adapted to a developing-country context (Heeks, 2002). Such studies often seek to highlight the economic, organisational, political, cultural and social factors that influence the implementation and use of ICT (Thompson and Walsham, 2010). The transfer and diffusion perspective challenges the practicability of

solely transferring technological innovations from a developed country into a developing country with the expectation of the same organisational practices and outcomes (Avgerou, 2008), although it maintains the generic assumption on the validity of purpose of the attempted ICT innovation, for instance to improve efficiency, as well as the validity of the underlying rationality of the transferred methods in the new context of practice (Avgerou, 2010).

The social embeddedness perspective, on the other hand, critiques the underlying assumption of IS within the transfer and diffusion perspective as being misleading and oversimplifying (Avgerou, 2008). The socially embedded innovation research traces the emotional, cognitive and political capacities that actors nurtured in their local social institutions bring to bear on the unfolding of innovation efforts (Avgerou, 2010). Studies of ICT innovation in developing countries that follow the social embeddedness approach draw upon social theories such as structuration theory (Walsham and Sahay, 1999), actor network theory (Stanforth, 2007) and critical theory (Silva, 2007) to address conceptual relationships such as agency and structure, technical reasoning and institutional dynamics, and technology and society (Avgerou, 2010). They tend to broaden the research perspective by moving beyond specific work practices and routines within an organisational setting. Silva (2007), for example, draws on critical theory to investigate the implementation of the data infrastructure of a land administration system in Guatemala. His study illustrates the unfolding power relations within the institutional context of the country and concentrates on the historically-formed lack of cooperation amongst institutions in the country, which has created conditions unfavourable for the sharing of data.

Rather than indicating that institutional cooperation is a factor in successful data infrastructure implementations, the study focuses on the reasons noted by local officers as barriers to cooperation among institutions. This study adopts the social embeddedness perspective as it addresses questions relating to the way particular categories of technologies and social actors' networks are formed, shape one another, and lead to particular socio-economic outcomes (Avgerou, 2010).

2.2.3 ICT4D and Actors

De (2005) argues that successful ICT4D implementation is based neither on the aspects of the user's acceptance, nor on change management alone (user's view), nor on their technical merits alone (the system view). Such systems are embedded in a network of interaction and a system of alliance performed within a particular social and cultural context, and their design and implementation requires an understanding of this context. However, when viewed out of this context, specifically as a proxy (for some economic criteria, e.g. high investment returns), or simply as a nominal object (simply a name of some other object, e.g. human development), or simply as a tool (to achieve specific goals, e.g. speed of delivery), ICTs may suffer a hard-to-pinpoint and prevalent problem of rationale; that is, why were they conceived and what was their goal? (Orlikowski and Iacono, 2001) This study considers the ensemble view of ICTs as the most appropriate for understanding the social processes of design, implementation and use of ICT4D interventions.

Several studies have emphasised the existence of multiple actors involved in IS development and use (Boonstra et al., 2008; de Vries, 2009). Lyytinen and Hirschheim (1987) draw upon Freeman's (1984) stakeholder concept to underline the importance of actors by stating that fulfilling the expectations of relevant actors is an integral part of IS project success. For example, Poloudi's (1999) studies on the health information network in the UK showed how the failure to meet the expectations of the medical professionals limited the use of the system, even though other professionals were willing to participate. However, Boonstra et al. (2008) argue that meeting actors' expectations will be especially challenging when implementing an IS since independent players are likely to have different expectations and objectives.

The concept of actors has been used frequently in the ICT4D community. Individual ICT4D projects around the world are usually set up in a variety of forms, from small grass-roots activities to multi-stakeholder partnerships between donor agencies, technology companies, governments and NGOs (Klein and Unwin, 2009). For example, representatives of the free and open-source software (FOSS) movement have sometimes played a role as partners in ICT4D projects. Their involvement ranges from fully free and non-profit applications developed by NGOs in project networks to models in which the software is made available

free of charge, without licence fees.   But maintenance and service are charged for by the small businesses that develop the software, with mixed solutions combining FOSS software with hardware provided at low cost by large technology companies, such as in the case of the FOSS-based computerised HMIS package (anonymously called F-HMIS) in the primary healthcare sector in India (see Sahay and Puri, 2008). However, a host of these projects have been criticised as top-down, supply-driven projects with limited or no impact (Heeks, 2005).

To date, there have been several uses of the concept of the stakeholder in the ICT4D literature, including studies on conflicting interests between actors (De, 2005), actors' identification technique (Bailur, 2006), and actors' dependence on context (Walsham and Sahay, 1999). Klein and Unwin (2009) argue that, in order to guarantee the success of ICT4D projects, they should meet the relevant development needs of specific user groups: they require a project champion who can bring together the many different actors involved; they require the establishment of trust between the different actors; they need to focus from the start on the sustainability of the initiative beyond any initial input of resources; they should be founded on a transparent ethical framework that openly acknowledges the contributions and expectations of the various partners involved; significant effort should be put into sustaining the partnership and its constituent networks; and they should have mechanisms in place whereby the needs of users can effectively be matched by the contributions that the different partners can offer.

Interestingly, even though the contribution of individual actors to an IS project has been extensively discussed, there is little in the literature on the process of shaping this project and examining the actors' coalition dynamics and how they could influence project decision-making (De Vries, 2011; Pan and Pan, 2006). Thus, there would appear to be a requirement for further work to relate existing developmental governance literature to the struggle between competing interests over who benefits from new investments in ICT infrastructures. This might include struggles over the sorts of enabling information architectures to be developed and the extent of privatisation and liberalisation allowed, as well as the governance, models and commercial bases for infrastructural delivery and support (Thompson, 2008).

Further, ICT4D researchers have called for a shift in ICT research that moves beyond the typical post-implementation review, concluding perhaps once again that an IT project should be more sensitive to the needs of its local users (Thompson and Walsham, 2010), toward an independent and informed policy-level critique of the way in which such technology is planned and implemented within 'developing' country environments, where people are often least able to complain when the benefits associated with ICT do not materialise (Thompson, 2008).

2.2.4   Impact of ICT Innovation on Development

This section discusses ICT and its development impacts in developing countries. The clearest examples of impact studies fall under the categories of whether ICTs contribute to economic growth or human wellbeing (Sridhar and Sridhar, 2007). The next section provides an overview of the concept of development, followed by the relationship between ICTs and the different meanings of development.

2.2.4.1   Development Discourse: A Historical Overview

Here the discussion focuses on some of the relevant debates that have featured in the development literature to trace the evolution of the human development perspective: the capability approach, which is the conceptual framework guiding this research. An appreciation of the field of ICT and development cannot be complete without unpacking the notion of development. There has been a considerable amount of debate on the definition, explanation and practice of development over the past few decades. However, this study does not intend to provide a universal definition of development, as definitions are contextual and contingent upon the epistemological, methodological or ideological orientation of their purveyors (Simon, 1997); rather, it seeks to provide a brief summary of the different meanings of development and to adopt an appropriate conceptualisation that is applicable to this study. Historically, when the discourse of development began in the 1940s, progress was viewed from the perspective of economic growth that had occurred during the period of the 1930s and the 1940s, predominantly in Western countries (Sen, 2004). During most of this time, developmental outcomes were measured in Gross National Product (GNP) or per capita income. These indicators were drawn upon by the

modernisation theory or the field of *'Development economics'*, which was concerned with the questions of economic growth (Escobar, 1995).

The modernisation theories were very prevalent in the 1950s and 1960s, with prescriptive assumptions about how states emerging from colonialism could achieve *'modernity'* (Akpan, 2003). In this view, for poorer countries to become more developed, they needed to follow the path already taken by more developed countries that had utilised power, the availability of capital, a skilled workforce and an entrepreneurial class to achieve growth (Sein and Harindranath, 2004). This view of development has enjoyed a long-standing dominance on account of the power of its institutional advocates (Simon, 1997) and has been adopted by several international agencies, national governments and global powers such as the World Bank and the International Monetary Fund (IMF) in promoting developmental initiatives in countries receiving their support (Zheng, 2009). In the late 1970s, there was an increasing body of evidence to suggest that only a few poor countries had managed to restructure their economies, increased their growth rates and taken advantage of the benefits of technological and scientific advancement (Madon, 2000).

The majority of poor countries were unable to attain economic growth as they were faced with growing indebtedness, social inequality, increasing poverty and environmental damage (McMichael, 1996). Upon the realisation that the modernisation policies did not reduce poverty, attention turned to the *"basic needs approach"*, which became part of the international development agenda in 1976 when the ILO adopted the Declaration of Principles and Program of Action for a Basic Needs Strategy of Development. The basic-needs approach targets equitable distribution of resources, poverty alleviation and the provision of basic needs. From the 1980s, development approaches with links to classical and neoclassical economic growth theories became dominant in influencing policies in both the developing and developed countries (Standing, 2000). The role of the state was reduced from its direct intervention in the production process to the creation of enabling environments for competitive markets (Grunfeld, 2011b). Privatisation of state-owned enterprises combined with regulatory frameworks became the focus of attention under the tenet that restructuring would promote growth through increased efficiencies and would

liberate countries from what neoclassical advocates considered distortions of inefficient state bureaucracies (Grunfeld, 2011b).

International financial agencies such as the International Monetary Fund (IMF) and the World Bank became dominant players in this evolution (Escobar, 1995) known as the Washington Consensus, which assumed that consumers would be able to effect change through *'consumer choice'* but did not supply guidance for government procedures to achieve this (Grunfeld, 2011b). In this process, the telecommunications sector in developing countries, which consisted mainly of state-owned operators functioning as monopolies, became subject to privatisation and competition (Grunfeld, 2011b). Within these classical and neoclassical economic approaches, there was a gradual shift from conventional top-down approaches to bottom-up community participation and empowerment (Kumar and Corbridge, 2002). Advocates of the neoliberal paradigm soon realised the importance of community participation in development projects (Bhatnagar and Williams, 1992) and terms such as *'social capital'* and *'empowerment'* have come to the forefront of international donor agencies and the Washington Consensus. Examples include the World Bank's report entitled *'Voices of the Poor'* (Narayan et al., 2000).

Local involvement in development projects usually consists of actors' participation, with civil society playing a significant role in the process (Puri and Sahay, 2007). The conception of the local community as beneficiaries or passive recipients gave way to terms such as *partners* (Grunfeld, 2011b). In this light, various development theories and strategies emerged (Boateng et al., 2008), among them the right to development approach (UN, 2006), the sustainability livelihoods framework (DFID, 1999), and the notion of sustainability in the *Brundtland Report* (WCED, 1987). As part of this process, various development initiatives were implemented to address the concerns that aid should be targeted at the marginalised poor (Grunfeld, 2011b). Such a shift gave rise to further new terms such as *'pro-poor'* (Sumner, 2004), where *'poor'* shifts beyond the emphasis on income to include other forms of deprivations (Chambers, 1995), even though Heeks (2008) argued that pro-poor innovation occurs outside the poor communities, but on their behalf.

The growing evidence that economic growth does not ultimately lead to development has resulted in new indicators of development that constitute a more multi-dimensional approach such as food security, literacy, life expectancy, health, water, gender equality and so on. The best-known indicators in the development discourse are the Human Development Reports published since 1990, the Human Development Index (HDI) and, most recently, the multi-dimension poverty index (UNDP, 2010). There are also the Millennium Development Goals (MDGs), adopted by the United Nations in 2000 as key development targets for the first part of the 21st century. These indicators, goals and reports resonate from Amartya Sen's Capability Approach (CA), which focuses on the expansion of human freedom both as the primary end and means of development (Sen, 1999). According to Jolly (2010), the CA is more flexible, less dogmatic, multi-disciplinary and clearly directed towards long-term international goals of sustainability, stability, equity and human rights. This study situates itself in the discourse of development that calls for a shift in focus from the economy to the people. Thus, the human development perspective and the capability approach inform this thesis.

2.2.4.1.1   ICT and Economic Development

The emergence of deregulation and privatisation has resulted in a wide body of knowledge on telecommunications and economic indicators, much of it reporting the positive effects of those reforms. These studies re-echoed earlier work on the relationship between telecommunications and economic development (Saunders et al., 1994; Norton, 1992). They assume that the expansion of the ICT network will transform the productive capacities of poorer countries by providing skills, access to knowledge, creation of job opportunities and tighter integration into the global market (Ngwenyama et al., 2006). Several econometric analyses captured from various cross-country data have shown direct positive relationships between diffusion of ICTs and economic growth. Thus, many donor governments and agencies such as the International Monetary Fund (IMF) and the World Bank have been encouraging developing countries to invest in ICT as a strategy for economic growth. For example, the World Bank (2009a) report on the economic impact of broadband shows an increase in economic growth per 10% increase in the diffusion of broadband in developing countries.

Gathering data on mobiles, some studies have confidently declared a positive and direct relationship between mobile usage and economic development. For example, Waverman et al's (2005) work on the impact of telecommunications rollout in developing countries appeared in a Vodafone report called "*Africa: The Impact of Mobile Phones"* (2005); it takes a macro view to report that higher levels of mobile penetration lead to higher rates of GDP growth. With its clear focus on impact, the Vodafone study generated much discussion within the ICT4D community, and provided additional data at a time when little was available (Donner, 2008).

In light of this evidence, the World Economic Forum Report (2010) asserts that any nation's poor economic growth is due to its lack of technological progress; hence, development issues are being translated into technological issues. ICT is being positioned by donor agencies and governments in this vein, with scarcity of technology being attributed to poor governance (Ciborra and Navarra, 2005). ICT innovations, under this assumption, seek to reduce the role of the state and, at the same time, promote privatisation and the market economy. The implementation of ICTs assumes a functioning market economy where the state is involved in the creation, protection and enforcement of property rights (Ciborra and Navarra, 2005). This assumption is embedded in the principles of an advanced Western economic growth model, which is expected to help developing countries to leapfrog underdevelopment by bypassing some of the processes of accumulation of human capabilities and fixed investment in order to reduce the gaps in productivity and output that separate developed and developing countries (Steinmueller, 2001). However, the topic of whether ICTs can help developing countries to leapfrog economic development, as they did in moving from very low landline penetration levels to high penetration of mobiles, is another highly debatable issue (Grunfeld, 2011).

While it has been argued that at least some of the developing countries may be able to do so, Howard (2007) did not find much evidence to support this notion, possibly because technologies are advancing rapidly in developed countries as well and it is difficult for poorer countries to keep pace. Souter (2004) further argues that, due to the regulatory environments, low skill levels, economic structures and low incomes, developing nations may not be as well-equipped to take advantage of ICT's potential to stimulate growth,

thereby falling further behind those countries, which are also benefiting more from rapid technological changes.

2.2.4.1.2   ICT and Human Development

While there is a growing amount of literature on ICT4D, there is still a lack of empirical evidence to show that investments in ICTs do lead to improvement of basic needs in developing countries (Avgerou, 2003; Akpan, 2003).

"The developing countries account for the majority of the world's population, and are important for this reason alone. In addition, developing countries contain millions of people who lack access to resources such as clean water, adequate housing, and education for satisfying basic human needs. Moreover, many people in developing countries lack the freedom to make choices in their own lives (Sen 1999). These conditions present a moral issue with which we should all be concerned" (Walsham et al., 2007, pg. 317).

In the diversity of theoretical approaches used in analysing the contribution of ICT to human development, findings show mixed results indicating indirect rather than direct benefits. While there are claims and some evidence of ICT's constructive contribution to poverty reduction and livelihood (UNCTAD, 2003; UNDP, 2005; World Bank, 2006a), there are also studies that conclude that the direct positive effects of ICT in poverty reduction have been limited and discouraging (Duncombe, 2006; Nielson and Heffernan, 2006). Many ICT4D projects and general ICT infrastructure have delivered improved communication capability, but this is more like an indirect contribution to development. Other authors have noted that, despite ICT's instrumental benefits for poverty reduction, not everyone usually benefits from it. Castells (1996) warned of the dangers of the transformative effect of ICTs on society in which the *"information have-nots"* may risk being excluded from the information society. Heeks (2009) re-echoes this concern, particularly about new ICTs which may favour the advantaged depending on their age, gender, economic status, ethnicity, location, and so on, hence widening the *"digital divide",* a term signifying the gap between those with and without Internet access. In a study of traditional garment weavers in Nigeria, Jagun et al. (2008) showed that weavers who did not have access to mobile phones lost orders to those who did, as shown in this quote: '*There were few signs, then, of mobile*

telephony levelling the playing field; and more signs that it had been a technology of inequality' (p.62).

Furthermore, the contextual nature of ICT may result in unintended and unanticipated outcomes. For example, Noir and Walsham's (2007) study of an ICT project in India's public healthcare system identified unintended benefits not directly linked to project objectives, including empowerment and computer literacy. Another positive unanticipated innovation was that of a local entrepreneur in Botswana who produced, bought and sold ring-tones for mobile phones, paying royalties to local musicians producing the tones (Urbach, 2007). However, unintended negative outcomes can also be seen in the Bhoomi project in India when the system was used by land speculators to identify farmers unable to afford land taxes; the speculators then offered to buy their land cheaply (De, 2006). From the perspective of human development and poverty reduction, it can nevertheless be concluded that improving the lives of the poor is not solely a matter of technology but also a matter of the social, political, institutional and cultural contexts which shape people's access to and use of ICTs (Warschauer, 2003).

2.2.5 ICT4D and Anti-Corruption Initiatives

This section discusses the role of ICTs in enhancing transparency and accountability. In order to do so, a brief overview of the corruption discourse is presented.

2.2.5.1   Corruption and Development

Over the past couple of years, there has been a growing interest in the political debate surrounding corruption. It has been argued that the dominant way of defining corruption in the development context is *"the abuse of public office for private gain"* (World Bank, 1997, pg. 8). This definition depicts corruption as a behaviour which deviates from the normal duties of civil servants (Kpundeh, 1995). The World Bank's definition of corruption has been widely criticised for focusing upon the public sector and upon civil servants who accept bribes, rather than on the actions of the corporations who may also be culpable of bribery (Brown and Cloke, 2004; Qizilbash, 2001). For the purpose of this study, the author defines corruption from the viewpoint of Sen (1999, Pg. 275) as the *"violation of established rules for personal gain and profit".* This definition thus includes activities not only of public

officers but also of anyone who violates established rules, thereby undermining public policies aimed at the realisation of basic needs (Qizilbash, 2001).

Corruption is considered to be a major impediment to poverty eradication and economic development (Zhang and Zhang, 2009; Anderson, 2009). It is undoubtedly an important issue and can be detrimental in various ways. According to Sen (1999), *"a high level of corruption can make public policies ineffective and can also draw investment and economic activities away from productive pursuits towards the towering rewards of underhanded activities. It can also lead.....to fostering of violent organisations such as the mafia" (pg. 275).* Here, emphasis is on the idea that corruption hurts public policies aimed at enhancement of capabilities and realisation of human needs. Economists generally concur on its adverse impact on economic growth. In addition, it hurts the interests of society's poorest, especially in areas were resources are scarce. Not surprisingly, there has thus been an increasing global movement to denounce corruption. The enhancement of transparency and accountability and the eradication of corruption now appear as a key agenda items at all consultative group meetings between individual debtor countries and international donor agencies (Brown and Cloke, 2004).

These have been led by the International Monetary Fund and World Bank's focus upon *"Good Governance".* Good governance is *"essentially the combination of transparent and accountable institutions, strong skills and competence, and a fundamental willingness to do the right thing. Those are the things that enable a government to deliver services to its people efficiently"* (World Bank, 2006). Better accountability and improved transparency are characteristics of good governance, and the latter becomes a prerequisite before the rich states and donor agencies supply aid to developing countries (UNDP, 2001). Hence, many governments of developing countries in recent years have devoted substantial energy and resources to developing measures to combat corruption in order to meet the millennium development goals (Anderson, 2009). These anti-corruption measures are tied to economic development aid from sources such as the World Bank and the International Monetary Fund (Bertot et al., 2010).

According to the World Bank (1997, pg. 35), "*Economic policy reform should be the main pillar of an anti-corruption strategy in many countries. Deregulation and expansion of markets are powerful tools for controlling corruption and the bank will continue to encourage governments to pursue these goals wherever feasible*". The agenda of "*good governance*" also assumes that the use of ICTs will ultimately enhance transparency and accountability (Heeks, 2001). Since governments and policy-makers are rapidly jumping on the bandwagon of ICTs to help reduce corruption, it is urgent that we empirically understand how such systems have had practical impacts.

2.2.5.2   The Role of ICTs in Enhancing Transparency and Accountability

Literature on ICT4D supports the argument that technology plays a significant role in public sector reform by reducing cost, increasing efficiency, increasing the quality of service delivery to business and customers, reducing the potential for corrupt behaviours and allowing citizens to track the activities of government by monitoring and controlling behaviours of civil servants (Shim and Eom, 2008; Ndou, 2004). The ability of ICT to enhance transparency and accountability is one of the areas that will be addressed in this study. The current literature on ICTs in developing countries indicates that ICTs have been effective and are already demonstrating benefits in reducing corruption. Anderson (2009) estimated the impact of e-government on corruption using the Control of Corruption index (CCI) from 1996 to 2006 in non-OECD countries. His study demonstrated that the increased use of e-government has led to reductions in corruption. Similarly, Shim and Eom (2008) examined the impact of e-government on corruption using cross-sectional data. Building on an estimation strategy, they noted that e-government has had positive effects on corruption. Other researchers have gone further to investigate specific ICT projects in developing countries that have claimed successes in reducing corruption.

In India, for example, the Bhoomi computerisation of land records has significantly enhanced the speed of accessing and updating land records. It has also removed the opportunities for local officials to collect bribes, a practice that was previously rampant (Bhatnagar, 2003). In the Philippines, the Department of Budget and Management's online e-procurement system has allowed public bidding from contractors in order to increase transparency and prevent price-fixing (Anderson, 2009). In Nigeria, a newly-implemented

geographical information system has allowed the detection of multiple land allocations and fraud by civil servants (Akingbade al., 2010). In South Korea, the Seoul Metropolitan Government's Online Procedures Enhancement for civil applications (OPEN) system has reduced corruption and increased transparency, especially in terms of regulation of the activities of civil servants (Kim et al., 2009). Although many implementations of ICT initiatives in developing countries have shown positive results in curbing corruption, there is still evidence that ICTs have not always led to breakthroughs in transparency or anti-corruption (Bertot et al., 2010). For example, Wescott (2001) points out that, while ICT eliminates many opportunities for corruption by those who do not understand fully the new technology, it opens up new corruption vistas for those who understand the new systems well enough to manipulate them.

Experiences in ICTs implementation in developing countries so far have not been encouraging, with 35 per cent being categorised as total failures - projects were not implemented or were implemented but abandoned - and 50 per cent as partial failures - major goals were not attained or there were undesirable outcomes (Heeks, 2002). These figures are disturbing, especially in developing countries that have limited resources and cannot afford to waste the vast amounts of money typically involved in such projects (Dada, 2006). Among the reasons for the failures of ICTs in developing countries are the frequent mismatches between the current reality and the design of the future system, and the large gap between the cultural, social, physical, economic and various other contexts enjoyed by the system designers and the place in which the system is to be implemented (Heeks, 2002). Case-study analyses of ICT initiatives in developing countries have shown that various factors that allow individuals and communities to access ICT services effectively are neglected. These factors depend upon skills, resources, beliefs, values and motivations of a range of actors involved in the design and implementation of the system (Madon, 2004).

Other issues are conflicts and resistance that emerge due to differences in perception of the systems by supply- and demand-side actors (De, 2005; Bailur, 2006). One issue that has received scant attention despite the growing interest now being paid to it, and which has been a significant contextual condition shaping ICT projects in DC (Sahay and Puri, 2008; Heeks, 1998; Mahmood, 2004), is the issue of corruption, which emerges from the groups of

people who are responsible for both the delivery and consumption of the services, and its consequences for the development outcome of the system. The reason for this could be its complex nature, which tends not to be discussed explicitly. Furthermore, empirically it is difficult to gather data, as participants often avoid discussion of this topic, and it is not discussed in formal discussions and reports (Sahay and Puri, 2008). Hence, it is hard to pin down but still permeates widely and shapes the investments of ICT4D initiatives in developing countries.

2.2.6   Corruption and ICT4D actors

ICT4D service delivery is heterogeneous at the sectoral and community levels and can involve informal and formal actors from both private and public sectors and civil society. The success of ICT4D depends crucially upon social, economic and political relationships between the hosts of the actors (Madon, 2005); these belong either to the demand side (those who will consume the services of the system) or to the supply side (those who fund, design and implement the system) or to both (De, 2005). These relations are complex because each actor has different interests and ambitions and, as a result, all kinds of tensions are articulated in these interactions. Plummer and Cross (2006) argue that corrupt practices emerge from the interactions between the various actors on a range of institutional levels, with different actors often involved in one or more different types of corruption. Often, donor agencies concur that public officials are corrupt and responsible for the failure of ICT4D projects in developing countries. However, Sahay and Puri (2008) argue that this perception tends to be narrow and suggest that it is important to consider the network of corrupt practices and expand the narrow views of corruption to encompass the diversity of its structure and forms. From the author's perspective, corrupt practices in ICT4D occur at three levels: firstly, within the initiation and actual design of the specific ICT4D project; secondly, within the implementation stage of the project; and, lastly, in the service delivery stage.

2.2.6.1.   Initiation and Design Stage

The design stage of ICT4D involves several actors from both public and private institutions. They include international, regional, national and sub-national agencies. Corrupt practices emerge from the interactions between both public and private actors in this stage. A typical interaction where corruption occurs is during the *selection stage* of the project. Projects with higher capital investments are favoured over those with lower investment alternatives because there are greater levels of potential kickbacks, with the greatest incidence, at the lowest possible risk (Plummer and Cross, 2006). For example, in the state of Pradesh in India, the health secretary contracted an American agency for the development of a Health Management Information System (HMIS) in just one district due to its high cost rather than a not-for-profit HMIS which was half the cost and would have covered twenty-four districts, as requested by the community (Sahay and Puri, 2008). This type of decision is usually made without the involvement of system beneficiaries. Hence, systems that are not relevant to the community needs are implemented, thus endangering their future sustainability (Cechhini and Raina, 2004).

Another situation where corrupt practices can be found in this stage is during the *policy design process*. In developing countries, policy reforms are usually executed in a top-down fashion that puts the public institution at the centre of any agenda aimed at eradicating corruption (Tran, 2010). However, it is these corrupt bureaucrats who are expected to implement these policies in a transparent manner. Sadly, political will rarely emerges from any corrupt system (Tran, 2010). In ICT4D policy-making, public officials and politicians responsible for IT policies seek to influence the focus of the technology. According to Heeks (1998), if a new system seems likely to increase transparency and accountability, powerful actors will change the design plan so that vital unaccountable processes are not automated or are not exposed to monitoring by the new system.

Such moves by the supply-side actors result in conflicts with and resistance from the demand-side actors, which can further lead to system disuse and abandonment. For example, during the design of the Computer-Aided Administration of the Registration Department (CARD), the chief minister was reluctant to eliminate a number of officials in the registration process of the system because they were responsible for collecting bribes,

which were used to fund the ruling parties' political campaigns (Caseley, 2004). Hence, ICT4D opportunities such as reduction of corruption are often incidental and not part of the design objectives (Bhatnagar, 2003). Furthermore, other interactions might include collusion between public officials, politicians and donor representatives in *targeting donor policies and funding*. Donor governments and agencies compete for aid beneficiaries. The inherent competitiveness of the aid industry seems to be increasing and donor agencies seem to be moving onto one another's *"turf"* (Harford et al., 2004). International donor agencies are under pressure to disperse grants and loans and to continue to implement policies and models that have worked in industrialised countries (Doig et al., 2007). Hence, donor representatives bribe government officials in order to target donor financing and build new relationships with aid beneficiaries (Plummer and Cross, 2006). In ICT4D design, this can lead to an emphasis on quantity, speed and donor policy implementation over specification and adaptability. Expecting developing countries to adopt models that have worked in developed countries has led to concerns about ill-formulated intervention strategies, resulting in failed ICT4D implementation due to the mismatch between what is designed and the realities of the context implementation (Soeftestad and Sein, 2003; Heeks, 2005).

2.2.6.2.   Implementation Stage

This stage requires interactions between private and public sectors for the procurement and implementation of the system. According to Plummer and Cross (2006), the procurement and implementation stage is the most publicised face of corruption. In ICT4D projects, a number of public and private actors are involved, depending on the size and scope of the project. Public actors might include national, state and local government officials and politicians, project managers, procurement managers, IT staff, and a set of private actors who may include suppliers, vendors, contractors and consultants. With large grants and loans, this stage may include the involvement of donor agencies influencing public officials to tailor the specifications of the projects to suit their favourite contractors, as seen in the case of the HIS project in India, where the donor agency influenced the state health secretary to contract the implementation of the system to an American agency that was involved in corruption at the delivery level by claiming payments and not implementing any working systems (Sahay and Puri, 2008).

Another type of corruption that occurs at this stage is when supervisors extort bribes from actors responsible for the implementation of the system in order to speed up the approval of payments. In India, for example, public officials in the accounts department requested a mandatory bribe from contractors in return for project-related payments for the purchase of computers, payment of IT staff and implementation of HMIS (Sahay and Puri; 2008). Furthermore, corruption in this stage occurs within the tiers of government and frequently involves bribes for appointments, transfers and promotions. For example, corrupt political and public officials might appoint willing civil servants to lucrative positions on the condition that they pay back some portion of the office income (Plummer and Cross, 2006). In ICT4D implementation, this kind of corruption occurs when politicians or public officials appoint their friends or party members to key positions in ICT4D projects to allow the propagation of other forms of corruption. In the HMIS project in India, the visionary and enlightened health secretary, who was also the project champion, was removed and transferred to a remote department because he was not aligned with the ruling party and could not accommodate the wishes of the corrupt politicians. He was replaced by an inexperienced new health secretary who was affiliated to the ruling party (Sahay and Puri; 2008).

Also, a majority of the Third World countries' administrative services are legacies of former colonial powers of Europe and have maintained a corrupt bureaucratic model (Coldham, 1995), where civil servants are *"generalists"* and take on short-term positions. They are then systematically moved by top government officials to different locations and positions (Best and Kumar, 2008). The majority of these transfers usually occur when senior government officers find it difficult to work with junior officers (Banik, 2001). In the e-government project (SARI) in India, the head of the Taluk office, who was instrumental in motivating staff to avoid resistance to change during the project implementation, and the district collector, who was responsible for co-ordinating and monitoring the project, were removed from office for no reason. The transfer of both key officials was a major blow to the institutionalisation of the project, from which it never recovered. The new officials brought in were allies of top politicians and government officials and failed to show the level of commitment to and leadership of the project exhibited by the former officials (Kumar and Best, 2006).

2.2.6.3.   Usage Stage

Here, the corrupt interactions take place between the consumers and public officials, mostly in the form of bribery (Plummer and Cross, 2006). They are usually petty, frequent and systematic, and normally occur at the point of service delivery. In the BOOMI system, kiosk operators and public officials introduce errors to the computerised land records, claiming they are typographical errors, and then demand a bribe for correction (De, 2006). In developing countries where there is a high rate of poverty and illiteracy, these conditions provide opportunities for public officials to extract bribes from citizens who are easily manipulated, especially when advised that their land records will be invalid if they do not pay the *"fees"* requested by the officials (De, 2006).   Furthermore, citizens also bribe public officials in order to obtain a much needed basic service. For example, in the Abuja Geographic Information Systems (AGIS), it usually takes two days for a complete computerisation of land records. However, citizens usually pay the public officials bribes in order to have their land records registered in just one day (Akingbade et al., 2010). Interactions can also include collusion between politicians, public officials and citizens.

Nepotism and bribery is a common practice in IT service delivery where politicians or civil servants favour their political allies or friends, as seen in the case of the AGIS when politicians and public officials were favouring their friends and helping them facilitate their online land applications (Akingbade et al., 2010). However, most of these interactions can also be done alone. Heeks (1998) gives an example of an African public works department, where automation of the payroll system allowed a computer staff member to enter details of *"ghost workers"*, whose wages he was able to collect. The corrupt practices emerging from the interactions between private and public actors can be due to the weak governance or feeble rule of law existing in developing countries (Shah and Schacter, 2004). Consequently, this results in ICT4D interventions not achieving their intended outcomes. Hence, this study argues that it is important to conceptualise corruption as a part of a system as it is far more complex than simply viewing it as public officials acting corruptly, which results in failure of ICT4D interventions.

2.2.7   Corruption and its Effect on Other Conditions Essential for ICT4D Success

Lessons learnt from implementing ICT4D suggest that a strong political will demonstrated by committed and knowledgeable leadership at all levels of government is key to its success (Kim et al., 2009). Political will refers to the demonstrated credible intent of both supply-side and demand-side actors to curb systematic corruption. However, in developing countries, the political will and power to support ICT4D interventions, which aim to enhance transparency and accountability, is often lacking. Government support for these projects has either been lacking from the start or withdrawn soon after the project has been launched (Madon, 2005). Hope and Chiculo (2000) argue that private and personal interests take precedence over the national interest in most developing countries; hence, the political will to commit to anti-corruption efforts remains mere rhetoric. Tangri and Mwenda (2006) added that, for political reasons, many leaders in developing countries are reluctant to commit to anti-corruption initiatives because funds corruptly obtained are diverted to election campaigns and ensure that the ruling government remains in power.

For example, in the case of the CARD (Computer-aided Administration of the Registration Department) system mentioned earlier, the Chief Minister refused to support the administrative service officer's proposal to reduce corruption by removing village administrative officers (VAOs), who were responsible for collecting bribes from citizens during the document registration process. This was because the VAOs were using the corrupt money to support local politicians from the same political party as the Chief Minister and they needed the money to help finance election expenditures (Caseley, 2004). Kpundeh (1997) notes that political will depends not only on the political and economic resources of reform champions but also on a willingness to incorporate and mobilise the interests of both supply-side and demand-side actors. However, it is argued that the supply-side actors, without the involvement of the demand-side actors, drive most ICT4D implementations in developing countries. A good example of lack of dialogue with demand-side actors is the process by which policy documents guiding the implementation of ICT4D are drafted in developing countries.

These policy documents are usually written by a group of donor agencies and actors who favour economic and political strategies that seek to reduce the role of the state. Since the opportunity to produce information and choose technologies and procedures other than those provided by external agents is restricted, marginalised groups and individuals are deprived not only of transparent information, but also of a political voice. Without the involvement of local and political actors in the implementation of ICT4D, the likelihood of failure increases dramatically as the proposed system might eventually fail to address the needs of the citizens (Cecchini and Raina, 2004). Many corrupt actors have tended to favour donor policies due to their top-down nature and emphasis on economic liberties such as privatisation and deregulation. Evidence has shown that privatisation has been a major source of corruption and rent-seeking in developing countries. For example, the privatisation of India Telecommunications resulted in a scandal that plunged the country into political crisis (Yardley and Timmons, 2010).

The most obvious example, in the case of Africa, is the Lesotho Highlands water project where more than a dozen multinational firms and individuals have been charged with bribing a former top public official of the project (Bayliss, 2000). Hence, corrupt officials are willing to support donor policies that restrict citizens from observing and monitoring policy-making and provide opportunities for corruption. In addition, when there is lack of political will by major actors, there tends to be resistance to the system by other actors whose interests, role and authority are likely to be damaged (Kpundeh, 1995). The introduction of ICT4D interventions, such as e-government systems, results in a perceived shift in existing power relationships in the delivery of public services and has deep implications for the sustainability of the system. In India, for example, village-level officials opposed the e-kiosk because it reduced their role and opportunities for corruption associated with control over how, when and to whom the services were rendered (Kumar and Best, 2006). Hence, Bertot et al. (2009) suggest the creation of a sustained culture of transparency within society. Corrupt practices that result from failed privatisation programs in developing countries further weaken public infrastructure, resulting in expensive, inadequate and erratic supply of services such as electricity, telephones and transportation (Doh et al., 2003). This is evident in many developing countries where the infrastructure necessary to deploy ICT4D is lacking (Basu, 2004). In India for example, the implementation of the Gyandoot project was

undermined due to poor telephone infrastructure. This issue further reduced the level of motivation among the kiosk managers to participate in the project (Ndou, 2004). Linked to infrastructure is access. In developing countries, the availability of ICT tends to be limited to the urban citizen, and its non-availability in rural areas poses challenges. Thus, the use of ICT in reducing corruption in developing countries appears to be limited, not because of the failure of technology, but due to its inability to reach all citizens in general (Pathak et al., 2007). In sum, one can say that providing information accountability using ICT can further reinforce inequalities of accountability due to accessibility barriers. Apart from access, beneficiaries must also have the skills and confidence to access and interpret the information provided (Heeks, 1998). However, De (2005) argues that the target populations of ICT4D interventions are usually not vested with the skills needed to use these systems. In developing countries, resources for literacy programs have become an attractive target for rent-seeking politicians. According to Ferraz et al. (2010) education funds are a major source of embezzlement by government officials in developing countries.

Furthermore, when ICT4D interventions are successfully implemented in developing countries, they tend to be used mainly for the purpose of reporting and promoting openness in government activities (Heeks, 1998). At best, they can alert recipients when there are some deviations in information provided. They cannot create complete accountability because they have no innate accountability property (Heeks, 1998). In India, for example, a public IS was implemented with the aim of enhancing accountability and transparency in community development projects. The system only supported openness by reporting on the expenditure of the project, enabling citizens to monitor and compare it with the project outcomes, hence identifying inconsistencies in which public officials had misappropriated public funds. However, the system did not provide any mechanisms for holding decision-makers accountable (Heeks, 1998). According to Johnston (1997), transparency efforts mean little if citizens cannot demand accountability backed up by credible threats of political or legal sanctions.

Hence, ICT efforts towards transparency need to be complemented by other anti-corruption strategies so that public officials can be made accountable (Akingbade et al., 2008). One way of doing this is to empower citizens by broadening their political alternatives; corrupt

monopolies could be weakened by the establishment of independent bodies to hear appeals against corruption, investigative agencies, and ombudsmen open to public complaints and scrutiny (Johnston, 1997). However, Shah and Schacter (2004) noted that, due to poor governance and high corruption rates, anti-corruption agencies are too institutionally weak to perform their duties; hence they are prone to being misused as tools of political victimisation. Anti-corruption agencies in developing countries lack executive independence (Coldham, 1995). The ombudsman is appointed by and answerable to the president for a period of time (ibid). In Uganda, for example, political leaders tend to influence and control ombudsmen whenever they threaten to expose the corrupt ways of top public officials (Tangri and Mwenda, 2006).

Furthermore, in most developing countries, these agencies do not have the power to initiate an investigation, and can only act on complaints submitted in writing (Coldham, 1995). However, due to the high rate of illiteracy in developing countries, the majority of the people do not have the skills and motivations to hold corrupt officials accountable; hence the potential of these institutions complemented with ICT4D systems can be limited. However, there are instances where demand-side actors, such as the citizens and civil society groups, insist on being included in the implementation process, although this is rarely achieved (De, 2005). Hyden et al's (2004) study of 16 developing countries illustrates that accountability and democracy can only exist where the government honestly exercises authority and is able to enforce law and order required for civil political action.

According to Molutsi and Holm (1990), if civil society is to organise itself in order to influence government decisions regarding important public interests, knowledgeable persons must be available to do so. As noted earlier, there are high rates of illiteracy in developing countries, and state officials and politicians embezzle funds intended for literacy programs. This results in weak, underdeveloped and fragmented civil societies in developing countries that are unable to encourage citizens' participation and public scrutiny of the state (Mercer, 2002; Fukuyama, 2001). In a country where civil society is inactive, power tends to be centralised within the government, and civil servants are more likely to abuse their power (Shim and Eom, 2009).

2.3 Critique of ICT4D

Researchers have questioned whether the vast amount of development funding should even be targeted at ICT projects (Wade, 2002) on the grounds that the poor have more pressing basic needs than those envisaged by the post-modernist development perspective which, after evaluating ICT4D initiatives, concluded that its goal of poverty eradication seems far away from being attained (Escobar, 1995). Rather than seeing ICT4D as a waste of resources, others have criticised its implementation as an attempt to reinforce the modernisation approach to development which emphasises economic growth and transfer of technology to leapfrog development (Wade, 2002; Castells, 1996). Other allegations that have been made include the hidden economic and political agendas of Western domination that ICT4D embodies and the vested interests in highlighting the efforts to bridge the digital divide, which may have the effect of locking developing countries into a new form of dependence on the industrialised countries (Thompson, 2005; Wade, 2002).

For example, Ciborra's (2005) study on the computerisation of driving licenses in Jordan traces the basis of the rationale for ICT interventions in developing countries to the Washington Consensus and the security interests of the US government, hence critically disclosing the logic of promoting the use of ICTs in developing countries that originates in the interests of the world's powerful rather than the concerns of development (Avgerou, 2010). Grunfeld (2011b) asserts that some organisations have promoted ICT4D in ways that could be interpreted as self-interest. Thompson (2004) illustrates how a recent ICT-related initiative by the World Bank Group can be seen as an attempt to replicate its position of strength within the predominant, technocratic discourse of development, to the exclusion of alternative views on technology, and even of *'development'* itself.

Using a method of critical discourse analysis, the paper then examines a recent speech on ICT by the Bank's president, which provides a detailed example of the way in which the Bank normalises and thus controls both ICT and those it classes as *'developing'* through the establishment of a systematised relationship between various key discursive components.
Also, in developing its strategy for entering the development domain, the Asia Development Bank (ADB, 2003) considered how it could *'move quickly and credibly in developing ICT applications and promoting their extensive use'* (pg. 5), suggesting it could promote ICT4D

initiatives in rural and marginalised communities *'in partnership with the private and/or other funding agencies'* (pg. 27). The World Bank and ADB's approach gives a hint of top-down technology transfer with no reference to community participation or demand-side consideration. Such an approach could reflect self-interest or an *'extension of the institutional myth of technology'* (Noir and Walsham, 2007).

Similarly, it was the World Bank rather than developing countries that developed the *'Global Development Gateway'*, emphasising the significance of ICT use to facilitate good governance and socio-economic development (Thompson, 2004). Such bias in favour of project sponsors, with insufficient consideration of beneficiaries, could at least partially explain why several ICT4D interventions have failed to achieve their intended purposes (Heeks, 2002; Soeftestad and Sein, 2003). In summary, critics of ICT4D see activities in this domain as an imposed exogenous force (Grunfeld, 2011b). Useful as the critique of ICT4D in general might be, the research result indicates that it is still possible to at least understand the contributions made by such interventions. Taking the ensemble view, ICT was conceptualised as part of a bigger 'package' going beyond mere technology to activities and interactions performed in specific social and cultural contexts (Sein and Harindranath, 2004).

In this view, the contextual and social aspects determine how ICT is conceived. Given that the success or failure of ICT4D interventions often depends on their 'fit' with the social, cultural and economic contexts in which they are implemented (Heeks, 2008), the implication for national development is explicit (Sein and Harindranath, 2004). However, this would require greater emphasis on the *'development'* in ICT4D (Thompson and Walsham, 2010; Heeks, 2010).

2.4 Gaps in the Literature and Research Questions

This section begins by citing relevant items of literature which, in calling for more research on the relationship between ICT and development, have identified some directions for future research. The section concludes with the research questions guiding this study. In recent years, there has been vast investment in ICT4D initiatives in developing countries for social, economic and political development. However, despite the potential of ICTs for the

improvement of individual livelihoods, community prosperity and the achievement of national development goals, Souter et al. (2005) state that there is:

'..little scientific evidence - in particular, evidence from detailed field research in specific poor communities about the ways in which individuals and communities exploit access to ICTs, particularly telephony but also radio and (where available) Internet, and the impact they have on livelihoods in rural and peri-urban communities. This is particularly true whereas in the vast majority of relevant communities ICT access development has not been accompanied by specific development initiatives. The lack of hard evidence on the relationship between ICT access and rural livelihoods inhibits effective decision-making on both ICT and livelihoods initiatives and programmes by development planners and the ICT sector, and means that scarce development resources may be ineffectively deployed or opportunities for effective pro-poor initiatives are being missed' (pg. 41).

Such statements have been echoed repeatedly with calls for more emphasis on the social, economic, cultural and contextual aspects of ICT in order to harness ICT4D to benefit community livelihoods (Avgerou, 2003; Akpan, 2003; Walsham et al., 2007). Also, there is a view that comments on the lack of a conceptual framework with which to structure the data-gathering and analysis. Claiming that the literature *'often lacked rigour: being descriptive rather than analytical; and often lacking clarity around, or lacking a sound foundation of, research methods'* (pg. 630), Heeks (2010) calls for more theory-driven approaches in understanding the contributions of ICT to development. Similarly, Avgerou (2010) voices her concerns that ICT4D research, *'despite its remarkable theoretical capabilities to study technology innovation in relation to socio-economic context, remains weak in forming convincing arguments on IT-enabled socio-economic development'* (pg. 1).

Research topics in ICT for developing countries are usually deeply intertwined with issues of politics, institutional arrangements, power and inequalities; only a limited amount of research has investigated the influence of, and interactions among, a wide range of institutional actors including industry, government and international organisations (Walsham et al., 2007). There is a call for ICT4D researchers to draw upon IS literature on power relations in understanding power dynamics which enhance or hinder individuals' opportunities for fulfilled lives (Thompson and Walsham, 2010). As noted earlier, the notion

of development is controversial and subject to a long-standing theoretical debate. The optimistic camp assumes that ICT will ultimately lead to development, while the pessimistic camp thinks that ICT by itself will not lead to development unless accompanied by social changes. Sein and Harindranath (2004) argue that the crux of the problem is the lack of conceptual clarity on the role of ICT in national development. Hence, Walsham et al. (2007) draw attention to the need to be specific about the particular aspects of development.

In spite of the greater maturity in ICT4D research, Mbarika et al. (2005) commented that research focusing on sub-Saharan Africa (SSA), a major region within the world's second largest continent, is almost non-existent in mainstream information systems research. They call for focused research on ICT development and application for SSA*.* Five years later, Thompson and Walsham (2010) noted that there has been a growing amount of literature on ICT in Africa with much work focusing on *"point"* implementations of ICT in African contexts, but an explicit focus on development is found to be lacking in most of these works. They argue the need to expand the research agenda on the use of ICT in African countries to include a stronger strategic developmental focus. An expansion of this research nature can seek to inform policy on the ways in which ICT can serve broader, more strategic developmental objectives than is evident in much of the literature to date. Thompson and Walsham (2010) posit that ICT4D literature that aims to pursue a *"developmental"* agenda needs to be broadened: first, from an institutional to a global research frame to encompass a myriad of actors and their interests; second, from a focus on *"point"* design and implementation to a wider critique that includes broader institutional, regulatory and political infrastructures; and third, from examining ICT initiatives from a market-driven perspective to an engagement in strategic, policy-level debate about the transformative potential of ICT within broader developmental agendas. Finally, Andrade and Urquhart (2012) call for researchers to examine the structure and intention of IC4D projects more critically.

2.5 Research Questions

Due to the limited time available to carry out a PhD, it will not be possible to address all the under-researched areas as discussed above in one thesis, although the study endeavours to respond to the many research calls in order to narrow the knowledge gaps in the literature. The research questions the study aims to answer are as follows:

1. How do the underlying motivations of different actors drive the design and implementation of ICT4D initiatives in developing countries?

2. How can researchers usefully conceptualise the relationship between ICT and development given the complexities in which ICT4D initiatives are undertaken?

While answering these questions may go some way to addressing the various calls for further research, it would be over-ambitious for a single PhD candidate to try to do more or re-invent the wheel, considering the achievements of many ICT4D researchers over the past decades.

CHAPTER THREE – CONCEPTUAL FRAMEWORK

"All models are wrong, but some are useful"

-George E. P. Box

3. Introduction

The domain of ICT4D research has witnessed the application of a wide range of conceptual frameworks from different academic domains ranging from economics, development, psychology, sociology, computer science and engineering. Usually, the application of these conceptual frameworks from diverse disciplines depends on the purpose of the research. As such, there is clearly no *"official",* recognised conceptual framework in the field of ICT4D.

This chapter summarises some of the conceptual approaches adopted in ICT4D research by loosely categorising them into: (1) frameworks from ICT studies; (2) frameworks from other fields; and lastly (3) frameworks from development studies. However, it should be noted that this is not a comprehensive classification but rather a taxonomy that will be useful in justifying the reasons for choosing Sen's (1999) capability approach as the guiding framework and how other frameworks might intersect with this favoured approach.

3.1 Frameworks from ICT Studies

Frameworks adopted in ICT studies have their roots in a wide range of disciplines such as psychology and sociology. Such theories which are discussed below include the adoption and technology diffusion theories and actor network theory.

3.1.1 Adoption and Technology Diffusion Theories

These theories are useful for understanding the motives for the adoption and use of ICTs. Such theories include the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al. 2003), Technology Acceptance Model (TAM) (Davis, 1989), and the Diffusion of Innovation (DOI) (Rogers, 1995). TAM models how users come to accept and use technology by focusing on the perceived ease of use and usefulness of the system while UTAUT is an extended version of TAM that models not only the perceived ease of use and usefulness of the system but also social influences and facilitating conditions that are direct determinants of usage intention and behaviour. The DOI, on the other hand, sees innovations as being communicated through certain channels over time and within a particular social system.

Drawing up the UTAUT model for a developing country, Gupta et al. (2008) examine the adoption behaviour of ICT to enhance government-to-employee interactions in a public sector organisation. Musa (2006) modifies TAM to incorporate human development and socio-economic factors that may hinder the access and adoption of ICTs using two developing countries as case-studies. Other researchers have drawn upon the diffusion of innovation theory as a framework in a wide range of ICT4D studies. For example, Roman's (2003) study focuses on the three areas of diffusion that are most relevant for telecenter application in rural communities: (1) the perceived attributes of innovations; (2) the communication aspects of the diffusion process; and (3) the consequences of innovation adoption. Other work includes Kumar and Best's (2006) study on the impact of users' characteristics and the diffusion of telecenters under the Sustainable Access in Rural India (SARI) project in Tamil Nadu, India.While the TAM, UTAUT and DOI provide an analytical lens through which to examine the use and non-use of ICT interventions in developing countries, they are not suitable for providing insights into the contributions of such interventions to development. Furthermore, they tend to focus more on behavioural intentions of users, which is far beyond the scope of this study.

3.1.2 Actor Network Theory

The Actor Network Theory (ANT) (Callon, 1986; Latour, 1986) has been used to investigate the process whereby the interests of different actors (both human and non-human) are aligned into a social and technological arrangement or artefact (Monteiro and Hanseth, 1996). In the context of ICT4D, Stanforth (2006) applied ANT as a framework for understanding the processes of implementing e-government in developing countries. Focusing on an Integrated Financial Management Information System (IFMIS), an application of IT by the Sri Lankan government, Heeks and Stanforth (2007) draw on actor network theory to provide valuable insights into the local and global actor networks that surround the project. As a theoretical lens for investigating the complexity of both human and non-human entities in ICT projects, ANT is inappropriate for understanding the contributions of ICT interventions to development, in spite of its ability to provide insights into the problems that may inhibit the outcomes of ICT4D interventions.

3.2 Frameworks from Other Fields

This section provides a brief discussion of other frameworks that are difficult to categorise into a specific ICT taxonomy. They include the structuration theory and institutional theory.

3.2.1 Structuration Theory

Giddens' (1984) structuration theory is concerned with the dynamic relationship between social structures and human agents. Structuration theory has been used by Orlikowski (2000) to develop a *"practice lens"* to explore how people interact with groupware technologies in their work practices to enact structures which shape their emergent use of the technology. This theory is useful in understanding the use of technology as *"a process of enactment"* that enables a deeper understanding of the role of work practices in the ongoing use and transformation of new technologies (Orlikowski, 2000, pg. 404). In ICT4D research, the theory has been used to explain the complex phenomenon of ICT4D interventions, as demonstrated by Prakash and De (2007) in exploring the computerisation of land records in India, and by Walsham (2002) in studying cross-cultural issues in software production and use in Jamaican and Indian software teams. While structuration theory focuses on agency and structure which are both relevant to this study, it does not explain the opportunities individuals have before exercising their agency (Briones, 2009), which is the focal point of this study.

3.2.2 Institutional Theory

This theory focuses on the process by which structures including norms, rules, routines and schemas become instituted as authoritative principles for social behaviour (Scott, 2001). As an analytical lens, the theory offers a wide range of concepts and approaches to analyse institutional change (Greenwood and Hinings 1996) and institutional persistence (DiMaggio and Powell 1983). In particular, a number of studies have applied institutional theory with a focus on ICTs in developing countries. For example, Silva and Figueroa (2002) draw upon King et al's (1994) adaptation of institutional theory to the IS field to discuss how to promote the improved use of ICTs in the Chilean institutional context. Also taking an institutional perspective, Madon et al. (2007) investigate the processes whereby digital inclusion projects in developing countries can become institutionalised through the creation of structures of symbolically accepted goals linked to relevant social activities and supported

by appropriate material resources. In sum, these studies reflect an interest in the relationship between ICTs and the institutional contexts in which they are embedded. In this study, the focal project's structure and relationship with authorities are considered in the analysis of the institutional context; however, because of its conceptual perspective, this study will not overemphasise the institutional environment.

3.3 Frameworks from Development Studies

The *"D"* in ICT4D research has been neglected despite the promise of a development studies perspective to guide research at the individual level (De, 2006; Grunfeld, 2011b). This section discusses two development frameworks, namely the sustainable livelihood approach and the capability approach. Both frameworks have been applied in the domain of ICT4D.

3.3.1 Sustainable Livelihood Approach (SLA)

The SLA examines livelihood resources and strategies that enable or impede the achievement of sustainable livelihoods for institutional processes and different groups. The key normative concepts of the approach are the tangible and intangible assets (physical, natural, financial, human and social) of individuals, communities and firms, and their ability to withstand shocks in environments that make them vulnerable (Carney, 2002; Scoones, 1998). According to Farrington (2001), the application of SLA for development intervention seeks to identify holistic, rather than sectoral, opportunities. When applied to ICT4D, the SLA has been used to understand the impacts of ICT on people's livelihoods. For example, Heeks and Arun's (2010) study on the social outsourcing initiative operated by the government of Kerala State, India, focuses on the impact of this initiative on the five areas of livelihood assets. The SLA has also been applied in assessing the regular use of ICT initiatives, as illustrated in Duncombe's (2006) study on ICT use by micro-enterprises for poverty reduction in Botswana. Gigler (2008) incorporates the capability approach into the SLA as a result of their partial philosophical compatibility for developing an alternative evaluation framework, which he applies to indigenous projects in communities in Peru and Venezuela. Despite containing several attributes of relevance to this study, the SLA approach remains an initiative of international donors and consultants and may not answer the research question in terms of practical realities.

3.3.2 The Capability Approach

As the theoretical lens informing the basis of this study, the capability approach is briefly discussed here, with further details in the subsequent section, which also describes how it has been applied in the domain of ICT4D studies. The capability approach conceptualises development as a process of expanding the real freedoms that people enjoy. Focusing on human freedoms, the capability approach contrasts with narrow views of development such as identifying development with the growth of gross national product, the rise in personal incomes, social modernisation, technological advancement or with industrialisation (Sen, 1999). Recognising the developmental importance of ICT, Sen (2005) extended it to include capabilities such as ICT literacy. According to him, "*access to the web and the freedom of general communication has become a very important capability that is of interest and relevance to all Indians*' (p.160). Considering the wide range of contributions ICT can make to the aspirations of people and communities, it is understandable that it should lend itself to analysis through the CA. The increasing popularity of the CA in ICT4D studies is an indication that it could provide the foundation for future studies in this area (Heeks, 2009).

3.4 Consideration of Conceptual Frameworks Presented in this Section

This section presents an elaborate discussion on the suitability of the capability approach as a theoretical lens for this study. While many of the frameworks discussed in the previous section are useful in ICT4D studies, none of them would be suitable on their own as a theoretical lens for answering the focal research questions of this study. In terms of providing insights into the contribution of ICTs to human development, which is what this study aims to address, Sen's capability approach serves as the most suitable theoretical lens. The framework guides the data collection and analysis throughout the research because it accommodates social and economic analysis, which holds that the wellbeing of a person ought to be assessed in the space of capabilities. This framework - the capability approach - was introduced and elaborated by Amartya Sen (1999) in his book *"Development as Freedom"*. Sen's capability approach is based on the critiques of opulence approaches (focuses on income and commodity command) or utilitarian approaches (focuses on happiness, desire fulfilment) which are typically found in traditional welfare economics (Sen, 1985). The capability approach is built upon three *"cornerstones"* as identified by Deneulin (2006): (1) it emphasises *'the expansion of freedom both as primary ends and as the*

principle means of development' (Sen, 1999, pg. xii); (2) it highlights the centrality of *"individual agency"* in addressing human deprivation; (3) it stresses participation. Recently, the capability approach has been adopted in IS to investigate the implications of design and adoption of ICT in society. In applying Sen's CA to ICT for development, the agency of ICT users is emphasised, thus highlighting the needs and aspirations of the people whose interests are affected by the innovations.

Zheng (2009) suggests that incorporating individual agency in studying ICT4D has two consequences. The first relates to the need for public discussions, participation and social inclusion in the process of ICT adoption and diffusion. The second relates to the evaluation of ICT adoption in terms of the extent to which it meets the needs and expectations of users (Madon 2004), rather than the rate of diffusion, the extent to which it fulfils the intentions of the designers or economic outcomes. The next section provides a brief description of the key elements of the capability approach and outlines its potential for making distinctive contributions to the research and practice of human development in areas such as poverty alleviation, gender equality and democracy. It also discusses the weakness of the capability approach, that is, its inability to take account of power relations that shape public policy. To address this issue, Lukes's (1974) conception of power is drawn upon in order to shed more light on individual agency when applying the capability approach to ICT for development. In so doing, the study will be able to understand the motivations for adoption and social consequences of ICT in modern life.

3.5 The Significance of the Capability Approach in Development

The key concepts entailed by the capability approach include capabilities, functionings and agency. Sen (1999, pg. 75) defines functionings as *"the various things a person may value doing or being"*. Examples of valuable states that become a person's wellbeing include being nourished, being healthy, being literate and being employed. Functioning also includes valued activities such as playing a guitar, and having a good reputation and a warm circle of friends. Functionings are not limited to a particular set of people or contexts, which is why the capability approach can be applied to both developed and developing countries, and to poor and rich alike. Evaluating human wellbeing in terms of functionings alone, however, is insufficient. Sen (1999) therefore augments this concept by introducing the notion of

capability. Capabilities refer to one's freedom to do what one values. Sen (1999, pg. 87) defines capabilities as *"the substantive freedoms a person enjoys to lead the kind of life he or she has reason to value".* The notion of capabilities is strongly linked to the notion of freedom, which Sen refers to as the real opportunity we have to accomplish what we value. Sen (1999) argues that freedom involves both the processes that allow freedom of actions and decisions, and the actual opportunities that people have, given their personal and social circumstances. The latter relates to the agency aspect of the capability approach. Sen (1999, pg. 19) defines an agent as *"someone who acts and brings about change, and whose achievements can be judged in terms of his/her own values and objectives".*

In sum, the capability approach normatively argues that institutional arrangements should aim to enhance people's capabilities, that is, their freedom to achieve or undertake valued beings and doings. According to Deneulin and McGregor (2010), the capability approach has contributed a new approach to policy thinking in four areas: (1) it argues for human beings and their quality of life to be the focal point of policy; (2) it considers human freedom and the ability to make decisions that affect one's life as the keys to human dignity; (3) it re-emphasises ethics as the core of policy-making; (4) it distinguishes itself as an approach and not a theory, hence allowing flexibility in its interpretation and use. The following section elaborates on the four main areas to which the capability approach has contributed.

3.5.1   Human Wellbeing as an End of Development

The core essence of the capability approach is its focus on the standard of living which *"lies in the living and not in the possession of commodities"* (Sen, 1985, pg. 6). As discussed earlier, the capability approach emerged as a radical critique of the utilitarian, income- or resource-based theories that are dominant in economic theories. Sen rejects the philosophical dogmas of these theories because they depend solely on utility and thus ignore the non-utility information from our moral judgements (Robeyns, 2005). Sen (1999, pg. 70-71) mentions five distinct sources of variation on the notion of why concentrating mainly on income and resources is insufficient for evaluating the outcome of human wellbeing: (1) personal heterogeneities: human beings have different physical characteristics and, hence, will have different requirements for meeting their diverse needs; (2) environmental diversities: variations in physical environmental conditions affect what a

person can get out of a given income or commodity; (3) variations in social climate: the differences in the social arrangements that prevail in different societies influence the conversion of incomes and commodities into quality of life; (4) differences in relation perspectives: differences in conventions and customs imply that there will be different commodity requirements of established patterns of behaviour; and (5) distribution within the family: distributional rules followed within the family (for example, related to gender or age or perceived needs) can make a major difference to the attainments and predicaments of individual members.

The latter point highlights one area where Sen *does* express his understanding of power dynamics relating to gender inequalities by showing how asymmetrical distribution of income in the family will often result in better wellbeing outcomes for boys than girls (Deneulin and McGregor, 2010). Sen (1999) does not argue that income and resources are irrelevant; rather, he argues that if we are concerned with wellbeing outcomes, then it is essential to include non-utility information, such as nutritional status, education, health and so on, which is usually excluded from the opulence- or resource-based approach. Indeed, income and resources are very important to human wellbeing; however, they are not ends in themselves but vital means of achieving freedom and wellbeing, in that they can only *"serve as a rough proxy for what intrinsically matters, namely people's capabilities"* (Robeyns, 2005, pg. 95).

This argument has been a primary message of the Human Development Reports to policy-makers: *"The basic objective of development is to create an enabling environment for people to enjoy long, healthy and creative lives. This may appear to be the simple truth. But it is often forgotten in the immediate concern with the accumulation of commodities and financial wealth"* (UNDP, 1990, pg. 9). In other words, development is not about what people have or command but rather about what people are able to do and to be with what they command such as being healthy, being employed, being able to participate in public affairs, and being able to voice their concerns in decisions that affect their lives. However, despite this powerful message from the capability approach and the Human Development Reports, income-based measures are still dominant in the core agenda of policy-making institutions.

3.5.2 Capabilities and Agency

While the capability approach emphasises that human beings should be placed at the centre of social and economic processes, it is more concerned with the substantive role of human freedoms than functionings for social evaluation. Alkire and Deneulin (2009) explain why human freedom lies at the core of the capability approach in its focus on capabilities. Firstly, if we only wished to pay attention to advancing functionings, then we could do so by domination, force or coercion. For example, the majority of our basic needs can also be met in prison. Indeed, some countries have adopted forceful strategies for enhancing functionings, such as the forced quarantine of victims infected with HIV/AIDS.

According to Deneulin and McGregor (2010), the focus on capabilities draws significant attention to the value of informed public action, social development and empowerment. Also, people sometimes choose to be deprived in one space in order to enjoy another kind of goodness. Sen often refers to the contrast between a fasting person and a staving child. Both of them are in the state of the same function, that is, undernourishment; however, a fasting person could eat if he wished but refuses to do so, while a starving child would eat if he could. The capability approach requires that we do not simply evaluate the functionings and ignore the real freedom or opportunities each individual has to choose and achieve what he/she values. The evaluation of equality must therefore take account of freedom in opportunities as much as in observed choices. The capabilities to carry out valued and valuable activities should hence make up a key aspect of the appropriate basis for evaluation (Unterhalter, 2009).

It should be noted that, conceptually, *"there is no difference as far as the space is concerned between focusing on functionings or on capabilities. A functioning combination is a point in such a space, whereas capability is a set of such points"* (Sen, 1992; pg. 50). In sum, Sen (2002, pg. 83) states: *"this approach focuses on the substantive freedoms that people have, rather than only on the particular outcomes with which they end up. For responsible adults, the concentration on freedom rather than only achievement has some merit, and it can provide a general framework for analysing individual advantage and deprivation in a contemporary society"*.

Further, Sen (1999) introduces the instrumental role of freedoms, which concerns the way different kinds of rights, opportunities and entitlements contribute to the expansion of human capabilities in general. Sen (1999) proposes five distinct instrumental freedoms that directly or indirectly enhance the capabilities of people. They include *political freedom*: freedom of expression and participation; *economic facilities*: freedom to participate in economic activities; *social opportunities*: entitlements to health and education; *transparency guarantees*: freedom to interact with one another under guarantees of disclosure and lucidity; and *protective security*: social safety nets for preventing the affected population from being reduced to abject misery.

According to Sen, 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 addition, Sen (1999) argues that the extent to which the five instrumental freedoms are secured is informative about the level of development of an individual, household or community. Thus, the success of public policy depends on promoting these instrumental freedoms. Policy aims should not be to force people into reaching states or achieving things that are valued by others but to provide the opportunities to achieve what they have reason to value. However, while the capability approach warns against the imposition of values by powerful agents, it doesn't say much about where these reasoned values originate (Deneulin and McGregor, 2010).

3.5.3 An Approach to Ethics, not a Theory

Normative public reasoning on the ends of policy-making is central to the capability approach. The capability approach stresses the centrality of value judgements about good life. The freedom-based approach requires that valuations be explicitly made (Sen, 1999). According to Deneulin and McGregor (2010), the proposed rationality underpinning policy decision-making depends entirely on the normative evaluations of its objectives; that is, are the objectives good? Do they enable people to live better lives? This contrasts with the other neoclassical approach that has dominated the ways in which social sciences have been applied and illustrated in public discourse: *"it is not the goal that is the question for the*

analyst but efficiency of the means by which we get there" (Deneulin and McGregor, 2010, pg. 508).

In Sen's words, a policy decision taken according to the neoclassical economic approach can be similar to *"a decision expert whose response to seeing a man engaged in slicing his toes with a blunt knife is to rush to advise him that he should use a sharper knife to better serve his evident objective"* (Sen, 1995, pg. 16). Thus, the capability approach limits itself to focusing on the informational basis for ethical judgements and does not recommend any particular way of identifying what people might have reason to value (Deneulin and McGregor, 2010). Further, the capability approach has often been mistaken for a theory of justice, which it is not. According to Alkire (2005, pg. 122), *"the capability approach is a proposition, and the proposition is this: that social arrangements should be evaluated according to the extent of freedom people have to promote or achieve functionings they value. If equality in social arrangements is to be demanded in any space and most theories of justice advocate equality in some space, it is to be demanded in the space of capabilities"*.

Similarly, Robeyns (2005, pg. 4) states that *"the capability approach is not a theory that can explain poverty, inequality and well-being; instead, it rather provides a tool and a framework within which to conceptualise and evaluate these phenomena. Applying the capability approach to issues of policy and social change will therefore often require the addition of explanation theories"*. For example, the human development index is used to rank countries according to their achievements in key functionings (Anand and Sen, 1994).

3.6 Policy-Making and Capability Approach

While the capability approach emphasises that public policy should be aimed at enhancing individual freedoms, Sen (1999) further argues that the process of initiating such policies should be based on political participation and democratic decision-making. In the following section, the importance of political participation in policy-making and the issues affecting political participation practically are discussed.

3.7 Importance of Political Participation

As noted earlier, agency is a key concept of the capability approach. People should not be passive recipients of social policies; instead, they should be active subjects of their own destiny. A tyrannical leader who guarantees his people the freedom to be educated, healthy and live in a safe environment still fails to recognise them as subjects of their own development. This is because the process of advancing human capabilities ultimately lies in the *"ability of people to help themselves and also influence the world"* (Sen, 1999, pg. 18). In modern society, this ability is particularly expressed through political participation and democratic decision-making. In development studies, the term *'political participation'* has been widely used and can be referred to as *"a set of principles and core values that allow people to gain power through participation while protecting them from arbitrary, unaccountable actions in their lives by governments, multinational corporations and other forces"* (UNDP, 2002, p. vi). According to Dahl (2000), before a policy is adopted members of the society should have effective and equal opportunities to voice their views and express to others what the policy should entail and encourage. Also, each member should have the opportunity to decide upon the policy and change it (ibid).

The human development perspective and the capability approach have brought concern for political freedom to the fore of human development. Sen (1999) classifies the universal value of political participation into three components: intrinsic, instrumental and constructive. Intrinsically, Sen (1999, pg. 10) notes: *"political freedom is a part of human freedom in general, exercising civil and political rights is a crucial part of good lives of individuals as social beings".* To deprive people of the freedom to engage in public affairs, through direct or indirect forms of political participation, is a violation of their human dignity (Deneulin, 2009). Dreze and Sen (2002) strengthen the argument further by asserting that this intrinsically valued freedom does not have to rest on the achievement of other capabilities. For example, not being employed does not mean that people should not be allowed to participate as political agents: *"being able to do something though political action for oneself and for others is one of the elementary freedoms that people have reason to value. The popular appeal of many social movements in India confirms that this basic capability is highly valued even among people who lead very deprived lives in material terms"* (2002, pg. 359).

Apart from its intrinsic value, public participation also has its instrumental value. Participation is beneficial because of its positive consequences. Because public participation is a mechanism through which people can voice and demand their needs in the public space – needs for example, about receiving adequate healthcare, better education etc. – it means that peoples' demands are heard and met. The third value that the capability approach attributes to public participation is that of its contribution to the construction of values through which a society is arranged. Public participation leads to the construction of collective values, such as values of social equity and tolerance; however, it is important to note that some democratically constructed values can be negative, such as terrorism and racism (Deneulin, 2009). In a democratic society, political organisations are founded based on certain principles and sets of values. In the United States of America, for example, the Republicans have a greater tendency to endorse the values of freedom as non-interference while the Democrats traditionally endorse the values of social justice and solidarity (Deneulin, 2009).

Depending on which political party wins the election, the policies that are crafted and implemented usually reflect the values of the winning party. To conclude this discussion on the value of public participation, it is important to bear in mind that, by recognising the intrinsic, instrumental and constructive values of public participation, the capability approach does not endorse any particular outcome of public participation. Whether the outcome of public participation is a neoliberal system that allows markets to function, or a social democratic system which interferes in markets and generates social welfare, it is in the hands of all people being fairly represented through democratic institutions.

3.8 From the Theory of Political Participation to Practice

In practice, democratic practices are never fully observed. Contrasting the practices of democracy with its ideals, Dreze and Sen (2002) point out that the actual practice of democratic ideals in a given society critically depends on a large array of factors. One factor that Dreze and Sen single out is awareness of policy decisions and implications. For example, the public should have access to complete information about the social consequences of a certain policy decision. If a government makes a case for, say, a certain type of agriculture policy, the public should have access to the information about the consequences of that

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policy. If the government hides crucial information, such as the impact assessment of the policy on the livelihoods of poor farmers, but publicises the impact of the policy on large-scale producers, that government could not be said to be *"democratic".* Also, Dreze and Sen stress the distribution of power in the country as a major factor impeding democratic practices. Those who are better off economically will also tend to be better off in educational terms, and hence have a better grasp of political issues than less-educated people; they will also be better able to influence policies according to their own interest – for example, public resources originally destined for education going instead to the furtherance of technology and science for a few at the expense of basic elementary schooling for the general population. In the case of India, Dreze and Sen (2002) observe that the issues discussed in the Indian parliament tend to represent the concerns of corporate chambers and the defence establishment rather than basic social issues such as primary education, healthcare and rural employment, which receive little attention in parliamentary debates. Among other factors that disrupt democratic practices is people's lack of the required skills to function politically.

Bohman (1996) introduces the concept of *"political functioning"* to convey the idea that political equality requires economic and social conditions. In order for a democratic process to be fair, those who participate in the process need the capability to function politically; that is, they need to have the capability to participate in public reasoning. This requires people to have certain cognitive and communication skills in order to engage in the public debate. The skills required for effective political functioning include the following: the skill to initiate public dialogue or make proposals about an issue; the ability to engage in argument and counter-arguments; skills in framing and reframing a debate; and finding ways to harmonise proposals and deal with conflicting views (Bohman, 1996). Public participation lies at the core of the democratic process. Decisions are not reached through force of violence, but through the force of argument and debate in the public space. For the human development and capability approach, democracy is first and foremost *"government by discussion"* (Dreze and Sen, 2002, pg. 379).

3.9 Putting all the concepts together

This section illustrates the key concepts (see figure 3 - 1 below) of the capability approach and explains their relationship practically using a bicycle as an example.

3.9.1. Functionings and Capabilities

Functionings are beings and doings, that is, ways of being and activities that people do which they value or have reason to value, for example, being nourished, literate or employed. However, functionings are not limited to a particular set of people or contexts, which is why the human development approach applies to both developed and developing countries, and to poor and rich people alike. Functionings also include valued activities such as playing a guitar, having a good reputation and a warm circle of friends. Evaluating human development in terms of functionings alone, however, is incomplete. Sen (1999) therefore augments this concept through the introduction of the notion of capability. Capability refers to a person's or group's freedom to achieve valuable functionings. Sen (1999) argues that freedom involves both the *processes* that allow freedom of actions and decisions, and the actual *opportunities* that people have, given their personal and social circumstances. It should be noted that Sen intentionally refrained from naming these capabilities and functionings, because different capabilities and functionings are used for different purposes.

3.9.2. Agency and Well being

Another two core aspects of the capability approach are agency and wellbeing. A person's capability can be evaluated in relation to his/her well-being whether defined in an elementary fashion (nutritional status) or in a more complex manner (self-esteem). Therefore, Sen speaks of well-being freedom or well-being achievements. Or capability can relate to agency, one's ability to pursue and realize the goals that he/she values and has reason to value. According to Sen (1999), an agent is someone who acts and brings about change as opposed to someone who is forced, oppressed or passive. Hence, Sen also speaks of agency freedom or agency achievements. The distinction between agency and well-being and between freedom and achievement can be clarified with an example. Let us suppose Paul and Collins are both successful sports athletes in the United Kingdom. Paul now decides to represent England in the commonwealth games in Nigeria for two weeks where he will have to face life threatening situations due to political instability. He thus makes the choice of trading-off aspects of his well being (*facing life threatening situations*) to exercise his

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agency freedom (*representing England*). Collins shares the concern with the high rate of kidnappings in Nigeria, but chooses not to sacrifice his achieved well-being (*stable life situation*) for this agency goal (*representing England*).

A crucial distinction of the capability approach, which is of importance to the study of the developmental impact of ICTs, is the distinction between commodities (goods and services), functionings (beings and doings) and capabilities. The approach recognizes the significant importance of commodities and material goods to our well-being in the short and long term. There is a valid connection between commodities and capabilities, and in order to expand capabilities and sustain these expansions, certain commodities are needed (Alkire & Deneulin, 2009). To clarify this connection, Alkire & Deneulin (2009) used a bicycle as an example to illustrate how these different concepts relate. A person may possess or be able to ride a bicycle (commodity). By riding the bicycle, the person moves around the city, and it is assumed that the person values this mobility (a functioning). However, if the person is unable to ride the bicycle because he/she is not permitted to ride or has no sense of balance, then owning a bicycle would not in fact result in this functioning. Hence, in this scenario, the person's own characteristic (balance) together with access to commodity (bicycle) creates the capability to move around the city when he/she wishes. Figure 3-1 adapted from Robeyns (2005), illustrates these relationships using these key concepts of the capability approach.
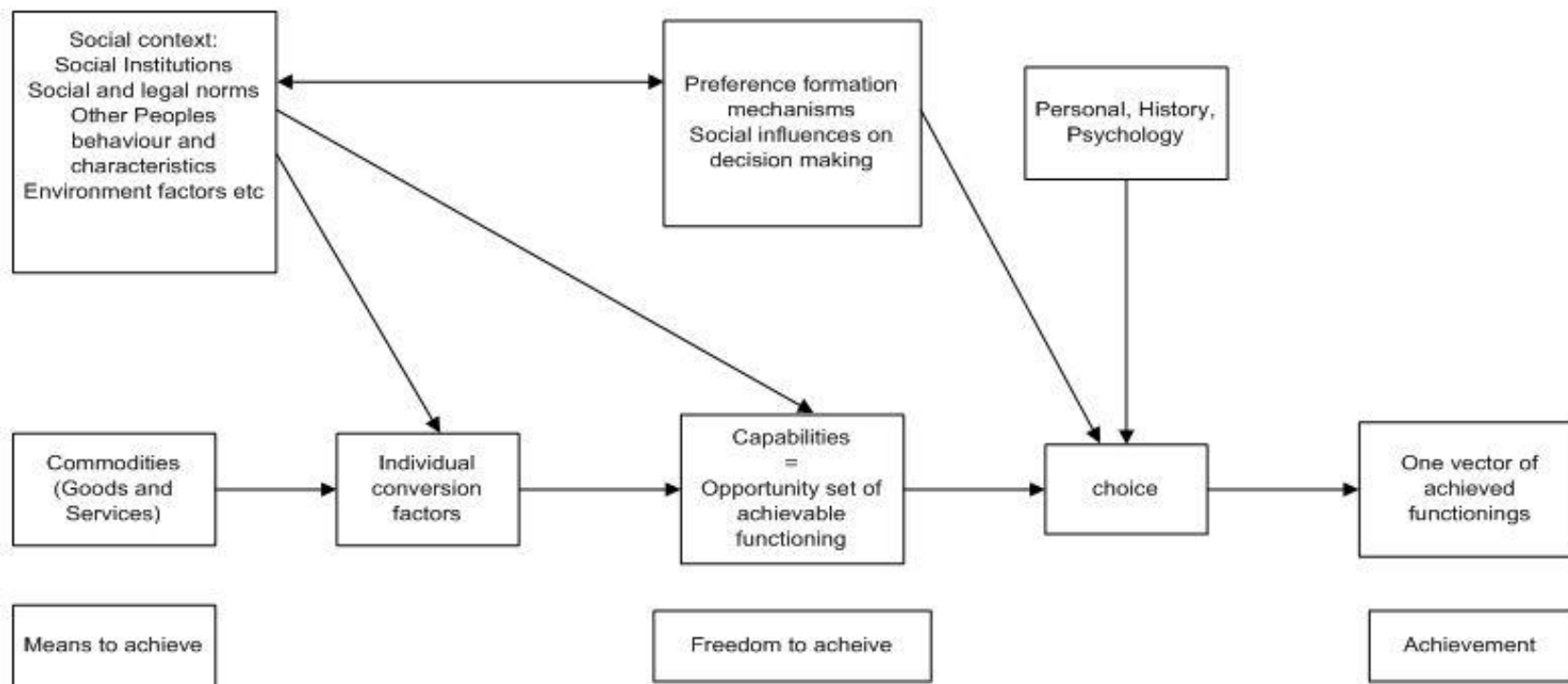
Figure 3-1. Relationships of the Key Concepts of the Capability Approach (Adapted From Robeyns, 2005)

In figure 3-1, individual conversion factors are thought to influence the extent to which a person can generate capabilities from commodities. Three categories are identified: personal conversion factors e.g. metabolism, physical condition, sex, reading skills, intelligence; social conversion factors e.g. public policies, social norms, discriminating practices, gender roles, societal hierarchies, power relations; and environmental conversion factors e.g. climate, geographical location (Robeyns, 2005). Furthermore, as shown in figure 3-1, commodities are not the only means of expanding people's capabilities, there are other means that function as inputs such as social institutions, social and legal norms, and people's behaviour and so on. Lastly, the achieved functioning is based on the personal choice to select from available capabilities and depends on personal history, psychology and other decision mechanisms. Hence, commodities, social institutions and so on are important means to well-being, but they are not the ultimate ends of well being (Robeyns, 2005).The question is: Which concept do we focus on? Which will be distorted the most (or least) often? The capability approach argues that utility can be distorted by personality or adaptive preference; functionings can be enjoyed in a prison or stifled environment; and a car can be useless if one has not reached the minimum age required to drive. Thus capability represents a more accurate space in which to investigate and advance the various forms of human wellbeing (Alkire and Deneulin, 2009).

3.10   ICT4D and the Capability Approach

A considerable effort has been made in the literature to examine the implications of CA to further understand the role of ICTs in society. Even Sen himself (2010) takes up the topic of ICT to discuss the contribution of mobile technologies in enhancing people's capabilities worldwide. Literature applying the CA to ICT contains a mixture of theoretical reflections and some empirical applications. The work of a number of writers on the capability approach and information systems can be loosely grouped into two categories: (1) those who have looked at the ways in which the capability approach intersects with other discussions about equality and social justice in ICTs; (2) those who have adopted the language of capabilities, functionings and conversion factors - how resources are translated into capabilities - and have empirically applied it to ICT for development by throwing new light on old discussions regarding the value of ICTs and the process for evaluating them.

3.10.1 Theoretical Reflections on ICT for Development

The first group of writers have linked the discussion on the capability approach with wider questions concerning equality and social justice in ICTs. They are concerned with addressing how ICT interventions affect and influence thinking about development. For example, Zheng (2009) draws on the capability approach to provide some theoretical reflections on e-development. It is argued that the capability approach, being a normative and evaluative approach, provides us with a different *"space"* to assess e-development and allows us to sensitise and take into account a variety of important issues surrounding ICT adoption for development. Above all, Zheng suggests a shift of space in studying e-development by moving beyond the measurement of technology diffusion, productivity and narrow cost–benefit analysis into a space of *"freedom".* Further, Zheng and Stahl (2011) argue that, when applying the CA to ICT, insights can be drawn from the domain of critical research. They argue that critical theory can contribute to the CA conceptually by providing a critical account of individual agency and strengthening the concept of technology beyond the simplistic notion of commodities.

Rather than focusing on Sen's CA, Coeckelbergh (2011) draws upon the Nussbaum (2006) perspective of the CA by exploring the particular nature of the relation between information technology and capabilities. He critiques the CA's means-end dualism concerning the relation between technologies on the one hand and humans and capabilities on the other hand. He argues that, rather than facing a choice between enhancement and development, it is better to reflect on how human-technological practices can be shaped, for example by using the language of capabilities. Toboso (2011) addresses the importance of human diversity. He presents an analysis of disability in CA within the domain of ICT. He recommends incorporating the concept of functional diversity into an analysis of wellbeing and quality of life of people with disabilities - aspects in which ICT currently plays a major role. He argues that, by doing so, it becomes clear that factors such as design for all, user participation and accessibility are vital strategies in promoting human equality in various environments of the information society.

Birdsall (2011) applies the CA to a topic that may seem far removed from the daily reality of the marginalised poor. He addresses the issue of how collaborative dialogue between ICT

and CA communities can be advanced. He proposes a communicative connection derived from the literature on the human right to communicate (RTC) in order to explore how the application of ICT in the real world can contribute to specific human capabilities. Focusing on computer ethics, Johnstone (2007) explores the value of the CA in the technological domain. She finds the CA to be specifically appropriate to technology ethics, enabling the incorporation of descriptive and normative analysis of ICT in terms of human values and needs. Finally, Andrade and Urquhart (2012) focus their studies on the political aspects of ICT for development. They draw upon Sen's political freedoms to discuss how far ICT4D projects are able to enhance the political liberty of the alleged beneficiaries, given that political liberties are constrained by wider institutional factors. They argue that ICT4D initiatives are predominantly informed by a modernist philosophy, which assumes that ICT4D users are merely passive recipients of the benefits of technology.

3.10.2 Using the Language of the Capability Approach in an Empirical Setting

A common thread in ICT for development literature illustrating the relationship between the capability approach and ICT is the attention given to the capabilities of users to benefit from ICT resources in a way that enables them to achieve their desired functionings. The capability approach can be beneficial in shaping the design and evaluation of ICT for development interventions and also taking into consideration the interests and needs of actors involved in such projects. Johri and Pal (2012) interestingly address the development issues in the technology design process. The authors propose a framework for designing ICT4D based on Sen's (1999) CA and Illich's (1973) concept of conviviality in a "user empowering" design process. They applied the framework in an ICT4D project in India and suggested the need to move beyond classical guidelines such as "interaction" and "usability" by including new elements such as "creativity" and "human self-expression".

Musa's (2006) modified version of the technology acceptance model (TAM) demonstrated the importance of the capability approach in its focus on the intrinsic value to individuals of such initiatives. De (2006) and Madon (2004) used the capability approach as an evaluative space for e-government initiatives in India: Bhoomi in Kartanaka and Akshaya in Kerala respectively. Focusing on Sen's five instrumental freedoms, De (2006) studies the impact of the Bhoomi system in India on the lives of farmers. The study illustrated that the success or

failure of the system could not be easily framed since the impacts could not be explicitly related to changes in capabilities. In some cases, the system improved the economic freedom of those who could afford the money and time to travel to the district office, but did not help the landless farmers. However, there was no participatory approach in the system design to enhance political freedoms. The system reduced corruption but failed to enhance social opportunities. Similar to De's use of the five freedoms, Dasuki et al (2012) and Maiye and McGrath (2010) evaluated the impact of ICT4D initiatives in Nigeria.

Madon (2004) focused solely on the functioning aspect of the CA to evaluate the Akshaya e-government initiative in India. She investigated how the system enables functionings, and what people did with the opportunities and the barriers to achieving functionings. The study illustrated that Akshaya had contributed to the empowerment of the citizens through their reliance on government. She concluded that, rather than solely focusing on indications associated with use and access, it is the real opportunities and real achievement of functionings that are the key and that should be integrated into policy-making in order to better balance the needs of different people. Similarly to Madon's study, James (2006) compares the welfare economic approach and the functionings-based approach in understanding the impacts of the Internet on poverty in developing countries using telecenter examples in India. He argues that the welfare economic approach is far too limiting and needs to be replaced by the functionings approach because it focuses on the actual use that is made of the Internet and is multidisciplinary in nature.

In comparing between Andhra Pradesh and Kerala respectively, Thomas and Parayil (2008) focused on the application of the elements of the capability approach (resources, conversion factors and capabilities) to discover better capabilities of using ICTs and converting information into valuable knowledge in Kerala. They suggest that, in order to bridge the digital divide, complementary policy interventions that promote greater equity and ensure access to education, health, electricity, roads and employment opportunities are needed. They conclude that access to ICTs alone does not lead to development, but requires political and social interventions.

Using the same elements as Thomas and Parayil (2008), Zheng and Walsham (2008) take a different approach to engaging in the debate on social exclusion in the e-society in two empirical studies of health systems in South Africa and China. They conceptualised social exclusion as capability deprivation, affecting wellbeing and agency freedom. Their study illustrates the relational features of social exclusion and the different types of capability deprivation, *"unfavourable inclusion"*, which can be masked by technological diffusion. They concluded that government policies need to go beyond technological provision and pay attention to socio-political, cultural and institutional aspects in ensuring effective utilisation of information and channels of communication, which should serve to enhance people's opportunity to participate in socio-economic and political activities.

Alampay (2005) uses the capability approach to demonstrate the linkage between access provisions and individual conversion factors, such as income, age and gender, to argue that this linkage determines a fundamental freedom or capability to utilise ICT for whatever functionings that may be of value. His focus is policy which must understand the role that individual conversion factors play in order to be effective. In summary, these studies argue that local conditions are important factors in the ability of communities to convert ICT resources into capabilities, that ICT can itself be a factor in this process, and that the contribution of ICT needs to be evaluated against the criteria of community perceptions of social exclusion and related capability deprivations. However, Vaughan (2011) goes a step further by allowing the possibility of additional capabilities that are valued by indigenous communities precisely because of the embedded ICT and its direct connection to their concept of wellbeing freedom. The study illustrates that ICT initiatives, which contribute to community wellbeing aspirations via the contribution they make to capabilities, enjoy community sustainability whilst other programs, which do not make this connection and merely provide a resource, such as access, fail to be sustained at the community level. She concludes that, by operationalising the CA in a context-specific way, ICT policy and program design can be improved so as to include more communities at the margins, hence achieving more socially inclusive ICT-based initiatives.

Lunat (2009) uses the freedom view of development with structuration theory to understand the dialectic relationship between domination and resistance in the redefinition

and reinforcement of students' use of ICTs to achieve desirable freedoms. The findings of the study show that the concept of freedom has become relative and conflicting on both sides of the wall, even though both campuses are within what once was the Greater Jerusalem District. Students have consequently used ICTs in different ways to pursue what they interpret as freedoms. In addition, ICTs may be facilitating a Palestinian exodus abroad and enabling the dissemination of outside values, creating tensions with the existing value system.

Informed by Alsop and Heinsohn's (2005) work on operationalising Sen's work and incorporating elements from the sustainable livelihoods framework, Kleine (2010) developed the *"Choice Framework"* and applied it in exploring the use of ICT by micro entrepreneurs in Chile. She argues that, while the choice framework can be further developed to enhance the operationalisability of CA, it's up to development funders to accept the fact that people's choices cannot be fully predictable and, hence, Sen's *"development as freedom"* will certainly be a dynamic and open-ended process. Hatakka and Lagsten (2012) incorporate both the technical and social features of technology into the CA in understanding how different uses of internet resources have enabled or constrained students' capabilities and functionings in institutions of higher education in developing countries. Their findings show that the CA enables a deeper understanding of why and how development outcomes are achieved.

Based on a longitudinal study, Grunfeld et al. (2011) evaluate an ICT4D project (iREACH) in Cambodia by testing a framework informed by the CA to assess whether and how such initiatives can contribute to capabilities, empowerment and sustainability. Their findings corroborate CA's emphasis on development moving beyond economic growth, and they support the significance of considering external conditions, which they conceptualised as the meso and micro levels, in the conversion of services provided by iREACH into capabilities. Focusing particularly on Sen's notion of freedom to access markets, Wresch and Fraser (2012) present a case illustrating how small Caribbean companies are using ICTs to take part in the process of globalisation by being able to compete in global markets; they also highlight the practical challenges experienced by these companies in trying to achieve the economic freedoms that ICTs are supposed to bring.

Thapa et al. (2012) address the critique that Sen's view on capabilities is too individualistic by incorporating the societal level through collective capabilities. They propose that ICT helps to create or enhance the social capital of communities which in turn can lead to development by building collective capabilities through collective action. They support their proposition in their study of an ICT4D project in Nepal and further state that developing collective capabilities also simultaneously enhances individual capabilities. As illustrated in table 3 -1, which contains more details of the various applications of the capability approach to ICT for development, literature applying the capability approach to participatory evaluation of ICT4D initiatives has not addressed the lack of recognition of individual agency and power relations when applying the CA on technological changes and social development (Zheng and Stahl, 2011). Most studies have concentrated on the wellbeing aspects, such as income, education, healthcare and so on. Heeks (2009) noted that operationalising Sen's work on capabilities and functionings with respect to ICT4D, i.e. understanding how ICT can facilitate the realisation of *"development as freedom"*, is "*a yet unfulfilled task*" (pg.23).

Embracing the challenge presented by Zheng and Stahl and Heeks, this study is an attempt to contribute to this topic by focusing on how societal context enables or restricts individual capabilities and agency in ICT for development. As Sen noted in *Hunger and Public Action* (1981), policy-making *"depend[s] on a number of influences, going beyond the prevalent notion of what should be done…there are political issues in policy making"* (pg. 19). Thus, two key questions that will be answered are: (1) What are the contributions of ICT4D intervention to individual freedoms? (2) To what extent have people been able to have a voice in shaping the design of ICT4D interventions? Practically speaking, this reflects the "evaluation" and "agency" aspect of the capabilities approach.

3.11   Critique of the Capability Approach

Sen (1999)'s capability approach to human wellbeing asserts that: (1) the success of social policies should be evaluated according to whether they enhance individual capabilities; (2) policies should respect people's agency and be particularly based on their ability to participate (Spence and Deneulin, 2009). Despite its far-reaching potential for transforming the way societal development and progress is conceived and pursued, as much in developed

country contexts as in developing country contexts, the capability approach has been criticised for its inability to analyse the role of institutionalised power in perpetuating or causing inequalities in the individual's freedom to achieve (Hill, 2003). This seems to be one of the areas of the CA that have been left ''incomplete'' (Robeyns 2006). As Hill (2003, pg. 117) points out, *"Until the analytical frameworks being developed as extensions of the capability approach address the issue of social power, the analysis of well-being will be incomplete, and decisions made to enhance human capabilities will systematically fall short".* In his book, *The Idea of Justice,* Sen discusses power in relation to capability: *"a capability is the power to do something"* (Sen, 2009, pg. 19). However, Deneulin and McGregor (2010) lament that his conception of power remains an individual attribute linked to the ability of an individual to do or be what he or she values. Eyben (2004) associates Amartya Sen's writings with the conceptualisation of power as *"power to"*, but Frediani (2010) argues that, to assess the process of transforming resources into functionings, it is necessary to take into consideration Luke's (1974) *"power over"* concept.

This relates directly to the main debate within the capability approach literature: non-list vs. list. As a vocal advocate of listing basic capabilities, Nussbaum (2003) has developed a tentative list of things that should constitute universal policy objectives. She admits that the list should be subject to review over time and in different contexts. Sen, in contrast, resists promoting a predetermined list at the theoretical level as he argues that it would *"deny the possibility of fruitful participation on what should be included and why"* (Sen, 2004, pg. 77). According to Sen, it is through public discussion or public reasoning that each society can agree on which freedoms to encourage or discourage. But Sen's focus on participation and discussion is not matched by an acknowledgement of the conflicting nature of different aspirations and strategies for wellbeing and how these influence the processes and outcomes of public deliberation (Deneulin and McGregor, 2010). In this sense, public reasoning cannot guarantee that the demands of each person will be met since they might be in conflict with one another; for example, the demands of the landed elite to keep their assets may conflict with the demands of landless farmers who wish to lay claim to the same land (Deneulin, 2009).

Also, human diversity lies at the heart of the capability approach but these differences mean that people engage differently with one another and differ in their ability to conceive of, pursue and achieve wellbeing; they also differ in their relations to the structures of society (Deneulin and McGregor, 2010). Research on wellbeing in developing countries confirms that, due to the social and economic differences that are present, not all the strategies and visions of wellbeing that people may wish to adopt and achieve will be collectively compatible (Copestake, 2009). In such instances, explanations for the rising level of poverty recognise that the marginalised poor often have to forfeit their wellbeing strategies and aspirations in order to fit or accommodate the goals of other powerful actors (Deneulin and McGregor, 2010). In sum, Sen's emphasis on agency and public reasoning has not been paralleled by an explicit emphasis and analysis of the political dynamics at play in advancing human capabilities. This thesis is intended to be a contribution to operationalising the CA by empirically applying aspects of it at the micro-level, whilst also paying attention to wider institutional factors. The study draws upon Lukes's (1974) concept of power to understand how these power relations affect ICT4D projects, their users and others in terms of facilitating or inhibiting capabilities expansion. In doing this, the study builds on previous work applying the CA in the context of ICT4D.

3.12   Politics and Power

Democratic decision-making cannot be associated with one single moment, policy-maker, decision or action. It involves a course of actions and webs of decisions (Hills, 2005). There is no unique *"policy*-maker" but a set of agents who make policy. For instance, it is not easy to identify who exactly crafts an educational policy. Is it the minister for education? Or, do international organisations determine the education agenda of a country? Who exactly decides on the budget allocated to education? These questions reveal that it is not easy to identify policy-makers or policy moments. Public policy is, more than anything else, a process. According to Spence and Deneulin (2009), policy-making cannot be easily distinguished from implementation. It is difficult to ascertain exactly when a policy is made. Does it occur at the time a law is passed in parliament? If, say, the UK introduces a new employment policy that encourages low-skilled workers to access the labour market by giving tax incentives to employees, is that policy tantamount to being a law in parliament, or does the policy also include its implementation? The policy is eventually what actors on the

ground are doing, regardless of whether businesses have made use of the law in order to boost low-skilled employment.

By separating policy-making from implementation, one risks ignoring the deeply political nature of policy itself. It is easy to attribute failure of a policy to lack of *"political will"*, as if policy were a technical matter that did not depend upon the implementation of those responsible for it. Furthermore, separating policy-making from policy implementation also ignores the principle that effective implementation planning is part of good policy-making, and that there are policy processes that organisations continuously undergo - policy analysis and design, decision-making, implementation, monitoring, evaluation and new analysis and design etc. Development policies have sometimes fallen into the trap of seeing policy as a technical issue the implementation of which is separate from its crafting. In an anthropological study of actions of various agencies in Lesotho during the 1980s, Ferguson (1990) highlights such a depoliticised use of the notion of policy. In such a depoliticised context, he argues that poverty is seen as something that requires technical actions from *"experts"* attached to governments, as opposed to being a larger political problem that could be resolved through politics and negotiating conflicting interests.

His study led him to conclude that "*development is an anti-politics machine, depoliticising everything it touches"* (1990, p. xiv). Politics along with history has been swept aside by development actors. In this aseptic universe, the state has become, as Ferguson argues, "*a machine for implementing development programmes and an apolitical tool for delivering social services and engineering economic growth"*. The state is a *"machinery with policies, but no politics"* (1990, pg. 65-66), referring to certain groups and interests controlling government actions. Its political nature suggests that it is closely connected to the concept of power. A policy is a chaotic process dominated by practical, political and socio-cultural forces. In his pioneering study on power, Stephen Lukes (1974) describes three dimensions of power at play in the policy process. First, there is the single dimension of power: "*A has power over B to the extent that he or she can get B to do something that B would not choose to do".* By virtue of A's power, B will modify his or her behaviour despite the knowledge that this may be contrary to his or her interests.

The second dimension of power that Lukes highlights is when "*A can limit the scope of the political process to considerations of issues that are innocuous to A (and possible against the interest of B)".* In other words, power is exercised in *"setting the agenda"* for decision-making and excluding people from it. This non-decision-making entails two processes: *"mobilisation of bias"* (ensuring that issues of significance to group A never enter the decision-making process, in other words, it is a process which confines decisions to safe issues) and *"organisation out"* (excluding opposing interest groups from decision-making". In the two examples above, power is overt. There is, however, a third, more insidious face of power. Even when there is no observable conflict of interest or consensus, this does not mean that power has not in fact been exercised. Power can be manifested in the form of (unconscious) preference-shaping. Not only might A exercise power over B by prevailing in the resolution of key issues or by preventing B from effectively raising those issues, but A could also influence B's conception of the issues altogether.

3.13   Key Conceptual Elements of the Capability Approach that will be applied in this Study

This section will discuss the key concepts of the capability approach that will be used in this study to understand the relationship between ICTs and development. They include institutions, conversion factors, commodities and capabilities, and the concepts of power as illustrated in the diagram below.
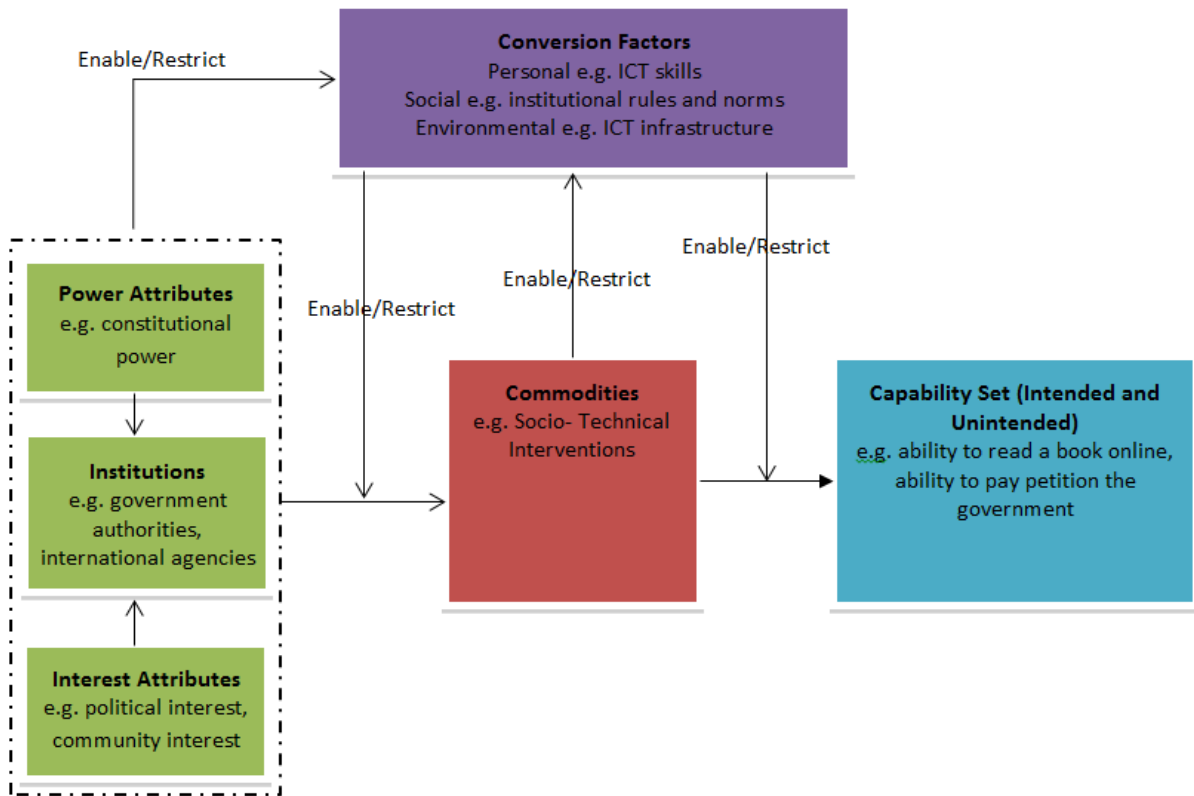
Figure 3 - 3 Key concepts of the capability approach using in ICT4D

3.13.1 Institutions and Agency

The design and implementation of ICT for development interventions are usually of a top-down nature where authorities decide on which development initiatives will be implemented in a community. Users and potential users of ICT are often perceived as passive recipients of innovations, as many technologies are transferred to the developing countries from the contexts of more industrialised nations (Walsham, 2001), and are often imposed on local users under the claims that these particular technologies will best serve their interests (Bailur, 2007). Preparations, planning and budgeting are done by the topmost powers and the communities are handed down artefacts the importance and use of which they do not understand (Hellström, 2010). Even local e-government projects or e-health initiatives are often implemented without the consultation and involvement of citizens or healthcare workers (Zheng, 2009). Such initiatives are likely to be irrelevant and insensitive to the local needs and, hence, likely to fail. An initiative that addresses the needs of the participating community has a higher probability of success (Hellström, 2010; Kleine, 2010)

The capability approach emphasises the agency of ICT users, and thus takes into account the needs and aspirations of the people whose interests are affected by the innovations. This has two implications. First, it signifies the need for public discussions, participation and social inclusion in the process of ICT adoption and diffusion (Puri and Sahay, 2003). Furthermore, the impact of ICT adoption is not to be evaluated merely in terms of the number of adopters, how well it matches the intentions of the designers, or the economic benefit it generates. Rather, it should be evaluated in terms of the extent to which it meets the needs and expectations of users (Madon, 2004). An essential emphasis on situated agency from the perspective of the capability approach also indicates the need to actively reflect, or even to challenge, deep-seated power structures and rationalities (e.g., Thompson, 2004). However, conversation factors can also enable or restrict individual agency. For example, participating in the design and use of ICT can be hindered by power relationships, the extent of relevance of the ICT projects and so on.

To understand the power relationships, Lukes's (1974) three dimensions of power will be drawn upon to elaborate on how the exercise of power hinders the enhancement of capabilities. The first-dimensional view of power is often called the "pluralist" approach and

a major proponent of this view is Robert Dahl who defines power as a situation where A has power over B in decision-making. The second dimension of power could be seen to operate in "non-decision-making". Here, a particular actor can intentionally be excluded from decision-making by another actor. The third dimension of power focuses on other ways to control the political agenda which are not made deliberately by the choice of individuals or groups, i.e. a situation where A influences, shapes or determines the wants of B. Understanding these three power dimensions can help us explain how power relationships operate and their influences on individual agency with regard to decision-making. Also, allowing individuals to exercise their agency in a public space can also influence conversion factors. For example, allowing community participation in an ICT for development intervention will enhance capabilities such as the ability to learn ICT skills, and the ability to participate and interact with other people in the workshop, as well as enhancing individuals' literacy.

3.13.1 Commodities, Conversion Factors and Capabilities

A CA perception of ICT emphasises human diversity, namely interpersonal variations in conversion factors and decision-making mechanisms in ICT for development. For example, ICT adoption can be affected by the telecommunications infrastructure, the level of information literacy and computer literacy of the user, and the extent to which knowledge generation, the economic power of the user and sharing are encouraged in that particular social environment. ICTs can also influence individuals' conversion factors. According to Zheng and Walsham (2008, pg. 227), "*the exploitation of commodities, such as technology, certainly contributes not only to social conditions but also personal characteristics which, in turn, feedback to conversion factors and decision making mechanisms. Therefore, commodities are important for their contributions to both individuals' capabilities and to conversion factors".* For example, in implementing an e-government system, the web services will enhance individuals' capabilities such as the ability to view government information, and the ability to communicate with government officials, as well as improving ICT infrastructure *(environmental factor)*.

When conceptualising technology as a means of enhancing individual freedom, the study argues that the various components of the technology should be unravelled and focused on

in order to understand which components can enable capabilities, what social interventions might be needed and how they can influence conversion factors rather than treating technology merely as a black box. However, it should be noted that some components of the conversion factors such as health and education are both means and ends in themselves. For example, an individual can use his/her computer knowledge to convert the Internet in sending email to family members, but that individual may also consider the fact that being knowledgeable and aware of the Internet is a significant part of his/her wellbeing. Furthermore, the framework shows that different conversion factors have different levels of importance in the conversion from commodities to opportunities, although these factors also tend to interact with one another. For example, members of the community may be willing to use a newly implemented telecenter; however, the lack of institutional arrangements *(social factor)* such as electricity and training programs may affect their literacy *(personal)* level and prevent them using the telecenters for beneficial purposes.

Moreover, while capabilities constitute the potential functionings that a person can achieve, achieved functionings are substantiated by the individual's choice to take certain actions upon the available commodities. Such decisions are again subject to factors such as personal values, social pressures, or other decision-making mechanisms. For example, some members of the community might prefer to stay at home and work on the farm to produce crops to feed their families while some might not even be aware of the capabilities enabled by the literacy centre, or perhaps the roads *(environmental factors)* leading to the literacy centre are bad. Hence, conversion factors tend to enable or restrict choice. Furthermore, achieved functionings can also have an effect on conversion factors and enable individuals to make better choices. Capabilities can also be either *intended* or *unintended*. For example, the introduction of Facebook in Egypt was not intended to facilitate protest marches against the country's autocratic regime; however, that is still a capability *(unintended)* that the introduction of Facebook has enabled.

Elements of the Capability Approach	Interpretation of the Framework in Terms of Research Issues
Social Institution (Agency)	What are the Institutional changes around ICTs?
	How the change did come about and what were the politics surrounding it?
	Were the intended ICT beneficiaries able to participate in the shaping and designing of the induced ICT change?
	How did political interests affect the way the reform was eventually worked out?
	Did the outcome of the policy-making meet the needs and aspirations of the ICT beneficiaries?
	What are the conditions that enable or restrict the individual's agency?
Commodities, Conversion factors and Capabilities	What are the social technical interventions and what are their features?
	What capabilities can potentially be generated from a certain type of ICT?
	Are they appropriate for local conditions at this stage?
	What conversion factors (personal, social, environmental) need to be in place for capabilities to be generated from a certain type of ICT?

Table 3 – 1 Interpretation of the Capability Approach in Terms of Research Issues

In conclusion, this chapter has discussed Sen's approach to development as the underlying theoretical lens of this thesis. It also suggests using Lukes's conception of power to help in the operationalisation of the capability approach.

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CHAPTER FOUR – RESEARCH METHODOLOGY

"If we knew what it was we were doing, it would not be called research, would it?"

-Albert Einstein

4.   Introduction

This chapter aims to discuss the philosophical assumptions underpinning this research. It also introduces the research strategy and the methods used for conducting the research. Both the methodology and its associated methods were chosen with the aim of having a *'valid'* research approach combined with the limited resources available for this study. This chapter also provides justifications for the rationale behind the decisions with regard to research methods and strategy. The importance of this chapter consists in defining the scope and limitations of the research design and exploring the various alternatives from which the researcher makes a choice. The chapter is also significant for categorising the study within the various research traditions in IS.The philosophical assumptions for conducting this study were drawn up from the interpretive research philosophy, which assumes that our knowledge of reality is gained only through social constructions such as language, consciousness, shared meanings, documents, tools and other artefacts (Kaplan and Maxwell, 1994).

The research strategy adopted for this study constitutes a single in-depth interpretive case-study of an ICT4D intervention. Fieldwork was carried out onsite during the period of 2010-2011 with frequent correspondence with informants on the site. The research techniques used are those traditionally associated with interpretive research in IS: observations, semi-structured interviews and document analysis. This chapter is divided into three main sections. The first section discusses the philosophical assumptions and methods underpinning the study. The second section focuses on research design and the research strategy, with a discussion of the author's understanding of an in-depth single case-study and an explanation of the rationale for the selection of the focused ICT4D intervention. The final section describes the research design, methods, process, data collection techniques, theoretical framework and mode of data analysis.

4.1.   Philosophical Perspective

The diversity of research paradigms posed complex challenges for the selection of the appropriate approach for this thesis. All research, be it quantitative, qualitative or mixed-method, is based on some underlying assumption about what constitutes an *'ideal'* research and what research methods are the most suitable. In this study, a non-positivist (interpretive) research stance was taken, with the assumption that access to reality (socially constructed or given) is only possible through social constructions such as shared meanings, consciousness and language (Avison and Pries-Heje, 2005). In general terms, interpretive research attempts to understand a phenomenon through the meanings assigned to it by actors. Silva (1997) recommends that a richer interpretive approach should move beyond the study of socially constructed meanings alone, and should also include the actions and structures that actors assign to them. According to Giddens (1984), social structures are essential prerequisites for the existence of social life since actors draw on structures to carry out their actions. In IS, interpretive methods are *"aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context"* (Walsham, 1993, pg. 4-5).

In this thesis, ICT4D is conceptualised as a socio-technical network with an emphasis on the implementation of electronic applications aiming to enhance people's capabilities, functionings and opportunities for them to solve their daily problems and lead decent lives. Accepting such an assumption that ICT4D is part of a socio-technical network leads the author to believe that interpretivism will be the most appropriate research approach to study the inter-linkages among the various technical elements and their relationship with development outcomes such as responsiveness, participation and transparency. This is because interpretive research takes into consideration how social reality is constructed by assigning meanings to actions. Also, social aspects such as culture, history and politics can be examined more thoroughly by following an interpretive position than by adopting other research traditions. Likewise, another reason for taking the interpretive stance in this thesis is the conception of ICT and development. This study accepts the premise that development is relational and can only be conceded in its outcomes. The concept of development can be studied from different angles; nevertheless, as discussed in the literature review section, development is contextual and its outcomes depend on social conditions. As such, the

author believes that development can be better understood by exploring the meanings social agents assign to it and reconstructing the context in which they exist.

In this study, the author investigates the process of implementation of an ICT4D intervention in Nigeria, from the conceptualisation stage up to the implementation (hands-on use), through formal and informally collected sources of data. The exploration process included being present in the context, observing the roll-out of the process, attending meetings, listening to and analysing what various actors were saying about their experiences, reading official government documents about ICT4D, and relating these empirical experiences with the concept of development. The follow section discussed the methodological perspective applied in this study.

4.2.   Methodological Perspective

In social research, methodologies may be broadly classified as mainly quantitative or qualitative. According to Silverman (2000), qualitative research is influenced by the researcher's political values whereas quantitative research simply objectively reports reality. Qualitative data are usually non-numerical data such as sounds, words, images etc., found in such things as research diaries, company documents and interviews, while quantitative data are usually generated by experiments and survey. This study was conducted using a qualitative research methodology with the aim of understanding the phenomenon within its context in order to develop rich interpretive insights. Additionally, Trauth (2001) identifies three main reasons for the choice of qualitative methods in IS research: the degree of uncertainty surrounding the phenomenon (certain contingencies of the problem); the researcher's theoretical lens (surrounding epistemological issues); and the nature of the research problem, which Trauth argues should be the most significant influence on the choice of methods.

Accordingly, the motivation for the choice of qualitative research methods in this study was the fact that development is interdisciplinary, complex and contextual and as such requires the exploration of the context rather than the use of predetermined methods. The fact that ICT4D projects are new in Nigeria creates a certain degree of uncertainty about which aspects of ICT4D to focus on in the research, hence making it more appropriate to use

qualitative research methods. For a scenario of this nature, qualitative research methods are deemed more suitable and, as such, they were adopted due to the value-laden nature of their mode of enquiry. Furthermore, the qualitative methodology was chosen over the quantitative methodology due to its ability to show how events and patterns unfold over time and to provide an account of the context within which people's behaviour takes place (Bryman, 2008). Silverman (2000) argues that qualitative methods can provide a *'deeper'* understanding of social phenomena which would not be obtained from purely quantitative data. Nevertheless, qualitative research methods have been criticised as being too subjective and impressionistic. Others argue that it is difficult to replicate a qualitative study and that the scope of the findings of qualitative investigations is restricted (Bryman, 2008). This study examined *'how'* human wellbeing can be attained through ICT4D and what contextual aspects are involved in the process. Neuman (2003) recommends that researchers understand the context of the situation and particular actions.

The study does not aim to present objective truths, but rather seeks to understand from the different informants how they perceived ICT with regard to development. Qualitative researchers study things in their natural settings, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them (Denzin and Lincoln, 2005). Although the study is qualitative, quantifiable data were also used to explain some findings. For example, the size of the population and some other socio-economic indicators were studied to understand changes in development status. In the next section, the research design is presented.

Quantitative	Qualitative
Numbers	Words
Point of view of researcher	Researcher close
Theory testing	Theory emergent
Static	Process
Structured	Unstructured
Generalisation	Contextual understanding
Hard, reliable data	Rich, deep data
Macro	Micro
Behaviour	Meaning
Artificial settings	Natural settings

Table 4 - 1 some common contrasts between qualitative and quantitative research (Adapted from Bryman, 2008).

4.3.   Research Design

According to Flick (1998), the core of a good qualitative research design is the application of a set of principles that are rigorous and open-ended at the same time while doing justice to the complexity of the social setting under inquiry. Janesick (2000) draws up the choreography of metaphor in order to explain the qualitative research design. Particularly, she compares the qualitative research design with a dancer's three stages of warming-up and preparation, stretching exercises and cooling down. At the initial stage of *"warm-up"*, the researcher decides the research topic, research questions, and the research strategy. The results of this process in this research are included in chapters one and two. The second stage of *"stretch exercising"* constitutes some background work and the actually fieldwork execution. The results of this stage are reflected in chapter four. Finally, in the *"cooling down"* stage the researcher has to decide when to *"ease out"* of the research setting and start analysing and presenting the research findings. The results of this stage are included in chapters five, six, and seven of this thesis.

The research was carried out in two phases: May to August, 2010, and February to May, 2011. During the first phase of the research several participants were involved. The head of Technical Operations, five PHCN staff, two contractors and eight electricity consumers were involved in the study, providing their views and experience on the implementation and use of CEMS system. In the second phase a follow-up research was conducted based on the findings of the first study carried out in the initial phase. This stage of the research was more in-depth and involved more supply-side and demand-side actors. Most of the participants in the second phase were selected because of the influence they wielded over the issues regarding the initiation and implementation of the ICT4D intervention that were uncovered in the first phase of the research. Such a study design was beneficial in enabling a follow-up of the ICT4D project at different points in time, allowing the researcher to monitor and track changes in development issues from the initiation and implementation of the project up to the use of the systems developed within the project. The next section discusses the research strategy used in this study.

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┌─────────────────────────────────────────────────────────────┐
│  Computerized Electricity Management System Project –        │
│  Plateau State, Nigeria                                      │
│  Research Site visited –PHCN Regional Office and Local        │
│  communities                                                 │
└─────────────────────────────────────────────────────────────┘
                              │
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                    ┌──────────────────┐
                    │ Initial Findings │
                    └──────────────────┘
                              │
Phase 1 - May to August 2010 │
– – – – – – – – – – – – – – – – – – – – – – – – – – – – – – – –
Phase 2 – February to May 2011
                              │
                              ▼
┌─────────────────────────────────────────────────────────────┐
│  Computerized Electricity Management System Project Abuja,    │
│  Federal Capital Territory, Nigeria                          │
│                                                              │
│  Research Site visited –PHCN Head Office, NERC, and Local     │
│  communities                                                 │
└─────────────────────────────────────────────────────────────┘
                              │
                              ▼
                    ┌──────────────────┐
                    │  Final Findings  │
                    └──────────────────┘
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Figure 4 – 1 The two phases of the study

4.4. Research Strategy

As mentioned in the previous section, the *"warm-up"* stage of the qualitative research design is when the research strategy is selected. Denzin and Lincoln (1994) give the following examples: case-study and ethnography. The main research strategy selected for conducting this research is an interpretive in-depth case-study of an ICT4D project. The following section discusses the case-study as a research strategy in IS and then reflects on the limitations entailed by the adoption of a case-study as a research strategy. Consequently, the conditions in which case-studies are most appropriate as a research method are also discussed. Finally, the section concludes by discussing the motivations and circumstances that influenced the selection of the project that acted as the case-study.

4.4.1. Case Studies

Case-study research is the most common qualitative method used in IS. There are several definitions, but Yin (2003) defines the scope of case-study as *"an empirical inquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident"* (pg. 13). Case studies

can follow either qualitative or quantitative approaches or a mixture of both (Yin, 2003, Stake, 1994; Doolin, 1996). Walsham (2005) goes further to highlight the significance of interpretive case studies. In interpretive case studies, the researcher becomes a *"passionate participant"* through a close interaction with actors (Guba and Lincoln, 1994, pg. 115). In this study, the author recognises that the research is strongly influenced by the underlying philosophical assumptions of the researcher. As mentioned earlier, this study follows the interpretive approach, thus an interpretive case study strategy was selected as an appropriate method for conducting research within the interpretive paradigm because it can link a broader view to continuous processes and their relation to context (Walsham, 1993).

A single case study of the Computerised Electricity Management System (CEMS) project was conducted in order to investigate the complex relationship between ICT and Development. A rationale exists for a single case-study if it represents a critical case to observe and analyse a phenomenon that has not previously been observed (Yin, 2003). The CEMS project represents an emerging ICT4D intervention in Nigeria with no formal comprehensive evaluation process since its conception, as such provides a good reason to conduct a single case-study. The author further considers that the case-study used in this study has an instrumental value because it can provide insights into the relationship between ICTs and development. The unit of analysis was beneficiaries of ICT4D interventions. According to Benbasat et al. (1987) the unit of analysis can be an individual, group or an entire organisation. Alternatively, the unit of analysis may be a specific project or decision. For this research, the ICT4D beneficiaries were selected in order to understand the contributions of ICT to human wellbeing, which could provide insights into the complex relationship between ICT and development.

The study also recognises the limitations and implications of the case-study research strategy. Galliers (1991) sets out three prejudices against case-studies in information systems research. Firstly, because social reality is interpreted by the researcher, research supported by case-studies might be biased. The second criticism of the case-study is the difficulty in clearly defining variables, making it almost impossible to control them. Lastly, Galliers argues that case-studies are very difficult, if not impossible, to generalise using

statistical techniques. Walsham's (1993) responds to this criticism arguing that the validity of the case-study does not depend on statistical generalisation *"but on the plausibility and cogency of the logical reasoning used in describing the results from the cases, and in drawing conclusions from them"* (pg. 15). Walsham (1995) further identifies four more types of generalisations by asserting that case-studies are also helpful in developing concepts, generating theory, drawing specific implications and contributing rich insights. The next section provides a discussion on conducting an interpretive case-study.

4.4.2. Conducting an Interpretive Case-Study Research

As discussed in the previous section, case-study research is accepted as a valid research strategy within the IS community. A set of methodological principles for case-studies of a positivist nature has been formulated by a number of researchers (See Yin, 1994; Benbasat et al. 1987). Similarly, Klein and Myers (1999) have drawn up the philosophy of hermeneutics to provide a set of principles for interpretive field research. They noted that, although the definition of a predetermined set of criteria might infringe the emergent nature of interpretive research, the deployment of some basic standards for conducting and evaluating interpretive research is significant and useful. Table 4 – 3 below presents a summary of the seven principles defined by Klein and Myers and how they have been applied in this research.

Summary of principles for interpretive research	Application of the principles in this study
The fundamental principle of the hermeneutic circle This principle suggests that all human understanding is achieved by iterating between considering the interdependent meaning of parts and the whole that they form. This principle of human understanding is fundamental to all other principles	The application of this case-study research in a longitudinal manner made the application of the hermeneutic circle possible. For example, the examination of supply-side actors' motivations and roles in different chronological points was a useful process for the understanding of the CEMS implementation process
The principle of contextualisation Requires critical reflection of the social and historical background of the research setting, so that the intended audience can see how the current situation under investigation emerged	The background of this research is presented in detail in order to offer a holistic picture of the context of this research
The principle of interaction between the researchers *and the subjects* Requires critical reflection on how the research materials (or "data") were socially constructed through the interaction between the researchers and the participants	The role of the researcher in this study has been clearly described as an outside observer. This stand is not considered an impediment; on the contrary it can lead to rich insights into the research context
The principle of abstraction and generalisation Requires relating the idiographic details *revealed* by the data interpretation through the application of	The principles of abstraction and generalisation are obvious for this research through the theoretical framework made for this research (figure of

principles one and two *to* theoretical, general concepts that describe the nature of human understanding and social action	framework). The discussion of the findings is made in relation to this framework, leading to the theoretical contribution of this research.
The principle of dialogical reasoning Requires sensitivity to possible contradictions between the theoretical preconceptions guiding the research design and actual findings ("the story which the data tell") with subsequent cycles of revision	The use of this principle for this research is obvious in the presentation of the theoretical framework, where the limitation of the initial theoretical framework (Capability approach) based on the current research is corroborated with another framework (Lukes's concept of Power)
The principle of multiple interpretations Requires sensitivity to possible differences in interpretations among the participants as they are typically expressed in multiple narratives or stories of the same sequence of events under study. Similar to multiple witness accounts even if all tell it as they saw it	This principle in conjunction with the hermeneutic cycle is fundamental for this research. The consideration of multiple interpretations from the widest range of actors has been a main focus of this research
The principle of suspicion Requires sensitivity to possible "biases" and systematic "distortions" in the narratives collected from the participants	The principle of suspicion has been seriously taken into account by this research as the importance of issues under investigation can make actors put forward views they wish to present to other actors using the researcher as an intermediary. The collection of multiple perspectives has been used to ease the effect of this phenomenon on the research results.

Table 4 – 3 Summary of principles for interpretive field research by Klein and Myers (1999). Application of the principles in this research

The application of the principles described above has been made obvious though the presentation of this research. In the next section, details of the rationale behind the selection of the case-study and details of the case-study under investigation are given.

4.4.3. Case-Study Selection

The selection of the sites for this interpretive case-study research was based on theoretical as well as practical considerations. At a theoretical level, according to Benbasat et al. (1987) the case-study selection should be based on the nature of the topic under investigation. For example, research on organisation-level phenomena would require case-study selection based on the firm's characteristics. For this research, which focuses on ICTs for development, CEMS possesses the characteristics relevant to fulfil the empirical and theoretical aims of this research. The characteristics include the following: (a) it is an ICT for development project; (b) it is implemented under the government umbrella and not through private institutions; (c) it is implemented under the umbrella of public sector reform efforts; and (d) its initiation coincides with the implementation of the national ICT policy. The project offers opportunities to analyse the whole process from inception to use, and potentially provides insights to analyse the relationship between ICT and development.

At the practical level, the matter of access dictated the selection of the case. Usually, gaining access to an organisation to conduct research is difficult, especially if the nature of the research is concerned with sensitive topics such as politics and power. Buchanan et al. (1988) suggest an opportunistic approach to gaining and maintaining access to organisations during fieldwork:

"This opportunist approach is supported by wider trends. Research access has become more difficult to obtain for at least two reasons. First, further education has widely recognised the value of project work across a range of courses and many organisations have been deluged with requests for research access. We have been denied access in some cases because someone else got there first. Second, as the economic climate has become harsher, in the private and public sectors, managers increasingly feel that they and their staff have little time to devote to non-productive academic research activities. These trends encourage the organisational researcher to become more innovative, devious and opportunistic in the search for sites and data" (pg. 55)

Buchanan et al. (1988) do not ignore the relevance of philosophical and theoretical aspects of the research; rather, what they are stressing is the difficulty in gaining access to data. Crompton and Jones (1988) acknowledge the difficulties researchers encounter when negotiating appropriate access to organisations for fieldwork. For example, managers may often be suspicious about the nature and purpose of the study. In this study, the author had a family relation who works as a technical manager in PHCN, and was interested in the research because the CEMS project was new and has never been evaluated formally since its implementation. Thus, the author was offered access to information and other staff of PHCN and stakeholders who were involved in the project without any hindrance.

4.4.4. Overview of CEMS

The Computerised Electricity Management System (CEMS) was initiated in 2006. The project involves a public-private partnership between the Power Holding Company of Nigeria, which is the public institution governing the use of electricity in Nigeria, the World Bank and two specialist electricity management firms (ENL Consortium and MOMAS systems). The main objective of the new system is to create a sustainable electricity management system with

specific goals of providing better access to electricity, eradicating the increase in electricity theft, reducing the abuse of discretion because of payments by third parties, fighting the pocketing of electricity revenue or cheating in the calculation of consumers' electricity fees, and improving administrative procedures for applying for electricity. PHCN is implementing CEMS, which was designed to computerise all aspects of electricity management and particularly to replace the century-old electricity registry and billing system. The replacement of these outdated, poorly-indexed paper registers and bills with a networked database system will, if effective, be quite revolutionary. CEMS runs under the power sector reform program which aims to improve public services and increase transparency in the electricity sector.

The project has already been piloted in all major urban cities across the 36 states of Nigeria. The main difference between this system and the previous one is that it has an online web system that will allow consumers to apply for electricity access by registering their homes/shops/organisations online, make complaints, check their bills and also make payments without hassle from PHCN officials, using channels such as vending points, web payments, mobile payments or designated banks. CEMS also includes a prepaid billing system that will allow the consumer to monitor electricity consumption. Having the prepaid system requires consumers to buy credits in the form of vouchers with a printed number which has to be keyed into the pad on the meter – very similar to 'pay as you go' mobile phones. When a consumer runs out of units, the system automatically disconnects the flow of electricity to the consumer's home. Other anticipated service improvements include real-time uploading of data to the central server to prevent data loss or corruption, and real-time updates on request, when the citizen's details change. Also, the new system will allow staff access to a unified email service, office documents and the Internet. Plans are underway to scale-up CEMS to include all rural areas and satellite towns around the country. Once complete, the entire population with access to electricity will be connected to CEMS.

4.4.5. Implication of Selecting CEMS

While the study acknowledges that most of the criticisms previously discussed with regard to a case-study research strategy are valid, it also supports Silva's (1997) claim that these criticisms can be overcome by rigorously conducting all research tasks such as the design of the research and the collection and analysis of data, be it interpretive or positivist research. The study also acknowledges that, due to the choice of research strategy, the findings related to the case-study cannot be generalised; however, they can give insights by drawing specific implications for ICT4D actors involved in the initiation and implementation of the ICT4D process as well as for researchers planning to investigate similar subjects in different contexts. In chapter eight, a more detailed description of the contributions of this study to practice and theory will be presented. Additionally, the selection of a case-study located in the author's country offers many advantages. Performing research on development requires the interpretations of actions after the reconstruction of their context. Both the interpretation of actions and the reconstruction of context require from the researcher a clear understanding of the cultural setting (Silva, 1997). One of the situations in which it is appropriate to select a single case-study, as discussed above, is when the object of study has not previously been researched in depth. This thesis offers an in-depth case-study of the contribution of an ICT4D to human development which has perhaps not been investigated since its inception in 2006. In the next section, the techniques for data collection and analysis used in this study within the case-study strategy are presented in detail.

4.5.   Research Techniques

In this section, the research techniques adopted for conducting the case-study are discussed. The research techniques for collecting data were semi-structured interviews, observation and interpretations of material and documents. The section concludes by discussing the challenges of operationalising the CA and the mode of data analysis.

4.5.1. Data Collection Process

The first phase of the data collection was conducted in Plateau State which houses the regional office of PHCN in charge of all PHCN activities in the middle-belt states. During this period, the author attended meetings at the PHCN office twice a week and conducted formal interviews. However, towards the end of August 2011 the author's invitation to attend important internal meetings held by the PHCN, where CEMS was discussed at the

national level, was withdrawn due to the fact that the author was not a staff member of PHCN but only a researcher. Also some of the key informants could not be interviewed as they were very busy, especially in supporting their respective candidates in the 2011 general elections that were taking place. Nevertheless, the author continued to investigate CEMS formally and informally based on press reports and interviews with junior staff and those participants who were former employees of PHCN. Furthermore, during that period there was an on-going ethno-religious crisis in the state between Muslims and Christians as well as the continued bombing of the state by the militant group "BOKO HARAM".

For the personal safety of the author, the research site was changed during the second phase of the data collection from Plateau to Abuja, where the larger proportion of the fieldwork took place. Abuja was selected because it is the political and economic capital, and it houses the head offices of PHCN and the Nigeria Electricity Regulatory Commission. These two institutions are the central hubs that supervise the major activities of PHCN across the nation. In addition, most national projects such as CEMS are decided, designed, tested and used in Abuja and then scaled to other states. During this phase of the fieldwork, the author met with the managing director of PHCN who granted access to investigate the project and shared his ideas on the vision of CEMS within PHCN and how he thought it is linked to the country's development. In addition, he explained how delicate the issue of electricity is, and emphasised the criticality of the development of a computerised electricity management system in the context of Nigeria. In addition, he directed the author to the Head of IT in PHCN and the Commissioner of Legal, Licensing and Enforcement from NERC, both of whom provided important instruments for the research: the Electricity Law in Nigeria and the design model of the CEMS.

The author also interviewed representatives of the contractors in charge of the supply and maintenance of the CEMS system. Each contractor had an office stationed in each PHCN district office. In addition, interviews were conducted by the author with respondents in areas where the CEMS was being used in order to investigate the business process underlying the electricity management system in Nigeria. Therefore, visits at all levels of CEMS were thereafter conducted on both formal and informal bases.

4.5.2. Data Collection Techniques

The issue of reliability and validity of case-study research can be tackled by using a triangulation of various sources of data (Yin, 2003). As suggested by Lennie (2006), the use of different methods, in this case for triangulation, gives richer data and access to the views of a larger and more diverse base of informants. Denzin (1970) noted that the use of triangulation helps to increase validity, decrease the investigator's bias, and strengthen the interpretative potential of the study. I now describe in detail each of the data collection techniques used. Denzin (1978) identifies four basic types of triangulation: (1) data triangulation, the use of a wide variety of data sources in a study; (2) investigator triangulation, the use of different evaluators or researchers; (3) theory triangulation, the use of multiple perspectives to interpret a single set of data; and (4) methodological triangulation, the use of multiple methods to solve a single case. The data collection method in this thesis entails multiple modes of data collection which helped with theoretical and methodological triangulation. The primary source of data collection in this thesis is interviews. However, other forms of data in interpretive studies, such as observation, press, media, and other publications on the sectoral context of the setting being studied, were used to supplement the interviews (Walsham, 2006).

4.5.2.1.   Interviews

The three basic approaches to conducting qualitative interviews include structured, unstructured and semi-structured interviews (Oates, 2006). The structured interviews are based on predetermined, standardised, identical questions for every interviewee. Semi-structured interviews are conducted with a fairly open framework which allows for focused, conversational, two-way communication. With the unstructured interview, the researcher has less control, the questions are not specifically limited or set and the conversation can flow freely. In this study, the semi-structured interview has been primarily used as the method of interview. The author established a set of categories corresponding to the theoretical framework and the sub-units of analysis; nevertheless, the respondents were allowed to express their views on aspects they considered of importance. The focus of this study was on investigating the rationale for the initiation and implementation of ICTD interventions in developing countries and their expected contributions to human development. Thus, the interview protocol (attached in the appendix section) focused on questions concerning: (1) the history and background of the research context; (2) the

motivation for the ICT4D intervention; (3) how project beneficiaries interpreted the contributions of ICT4D intervention to their wellbeing; (4) how the social cultural issues impacted on the expected contributions of the ICT4D intervention to human wellbeing.

During the data collection process, a total of 65 interviews were conducted at an average duration of one hour at the various sites with people with different backgrounds and roles within the implementation of the project, thus helping the author gain and collect different views about the same object (CEMS). Participants of the study were selected using a "snow balling" technique (Bryman & Bell, 2007). The snowballing technique involves the use of participants to contact other respondents and is particularly applicable when discussing sensitive issues (Streeton et al., 2004). Owing to the political nature of this research *i.e. a systems being deployed to enhance transparency*, the interviews were expected to build up discussions on sensitive issues such as *"corruption"*. Hence, it was essential to select those participants who were willing to be interviewed on such sensitive topics. Some respondents were contacts of the authors who were then used to recruit further participants. For example, as noted earlier, the technical manager of PHCN who was also a respondent was a relation to the author, who in turn identified other staff of PHCN and stakeholders involved in the project. The same technique was also used in identifying consumers using the CEMS systems. Some of the consumers were neighbours of the author because they lived in the same community and were asked to identify other consumers. This helped in gathering a large respondent base for the study. The snowballing technique continued throughout most of the data collection phase.

 In accordance with the ethics approval requirements of the Human Research Ethics Committee of the School of Information Systems and Computing at Brunel University, West London, United Kingdom, each participant was provided with an information sheet and consent form to sign and the author explained the contents to those with insufficient literacy skills to comprehend the documents. The consent form covered confidentiality and complaints procedures should participants be dissatisfied with any aspects of the research. Table 4-4 summarises the details of the fieldwork conducted, including people interviewed and the number of interviews conducted. Often, the interviews were conducted on a one-to-one basis, but on a few occasions the conversations took place over the phone and by

email in order to clarify aspects that were not clear in the face-to-face interviews. Some key informants were interviewed more than once. Usually, the interviews were conducted in the offices of the informants. Interviews were not tape-recorded due to the political nature of the subject topic which includes sensitive discussion on issues such as corruption; thus, participants did not want to be recorded, but notes were taken on paper. In fact, while taking notes as the interviewees were talking, the author noticed that stopping writing encouraged the interviewees to carry on. To record interviews, the author followed Walsham's (1995) advice of taking *"rough but extensive notes during interviews, and to write them up as soon as possible after the interviews".* During the analysis and organisation of data some of the notes were found to be incomplete because of the difficulty of asking questions and writing answers simultaneously. However, the author ensured that most of the major issues discussed during the interviews were noted down.

Interviewing without tape-recording helped the author to engage more with the informants, as the informants felt free to talk, although some still feared the consequences of what they were saying. Almost all the interviews were conducted in English, and only in a few cases were the interviews conducted in the local language (Hausa). Questions in the earlier interviews were aimed at gaining an understanding of the purposes of the applications, functionalities and benefits expected and also the existing ways of doing work through the use of CEMS. At the managerial level, the questions aimed to discover the motives for the new system, how the respondents felt the projects were linked to the country's development priorities, and the nature of their use. Contractors and other PHCN staff members including contractors and redundant staff were questioned to explore their views based on their direct involvement in the IS implementation. Interviewing redundant staff was one of the keys to obtaining information about the politics involved in the design and implementation of the system. It was observed that those no longer working for PHCN or contractors no longer involved in the project talked freely about the politics while those still involved in one way or another were restrained. Although some of the junior workers *did* talk about the politics involved, others demanded money before they would provide this kind of sensitive information. For moral reasons, the author decided not to make such payments.

In the later period of the research, as CEMS applications were then in use, questions posed to the informants were related to specific transformations that the system had effected in their work (improvements or otherwise). This helped us to evaluate the extent to which CEMS applications were contributing or not to the enhancement of people's capabilities and freedoms and consequently shaping the processes of development. The maximum number of notes the author took while interviewing at the same time was four, sometimes fewer. Overall, a total of about 140 notes from the interviews were compiled, organised and analysed later. The interviews were often accompanied by observation, which is discussed in the following sector.

Period	Location	Institutions	People Interviewed	Content of Interviews	No. of Interviews
May to August 2010 February to May, 2011	Plateau State Abuja	PHCN	Managing Director	History of CEMS, aims and the implementation process	1
			Branch manager	Electricity Registration, administration and management process	2
			Head of ICT department	Experience with CEMS, development and implementation	2
			Billing officer	Billing process and administration	2
			Customer service officers	Evaluation of CEMS	4
			Vendors	Experience with CEMS	4
			Contractors	Experience with CEMS and implementation	3
			PHCN staff	Experience with CEMS and implementation	8
			Electricians	Experience with CEMS and implementation	5
			System Developers	Experience with CEMS and implementation	2
			Marketers	Experience with CEMS	4
		Locality	Community Leaders	Evaluation of CEMS	2
		Ordinary Citizens	Ordinary citizens	Evaluation of CEMS	24
		NERC	Commissioner of Legal, Licensing and Enforcement	Electricity Regulations and Power sector reform	1
		NAPTIP	Training Officer	Implementation of CEMS	1
Total					65

Table 4 – 4 Summary of the Fieldwork

4.5.2.2.   Observations

Observations are usually carried out by noting and recording a phenomenon for scientific purposes. The observer does not manipulate, stipulate or intervene in the phenomenon being observed; rather, he or she should simply follow the flow of events. Qualitative observation is naturalistic in the sense that it records the events of the everyday life of the phenomenon under study in their real context (Silva, 1997). Observations allow the researcher to witness relationships and connections and open the phenomenological complexity of the world. Oates (2006) identifies two types of observation techniques: (1) The first is systematic observations where the researcher decides in advance the particular types of events he or she wants to observe and uses a predesigned schedule to note their frequency or duration; (2) the second is participant observation, where the researcher takes part in the situation under study, so that it can be experienced from the point of view of the others in the setting. This can be overt – people know that the researcher is carrying out research into what they do. Or it can be covert – people think the investigator is a 'normal' person, not a researcher.

Oates (2006) goes further to distinguish four types of participation based on the nature of the participation: (1) a complete observer is present in the setting either overtly or covertly, observing everything that occurs, but taking no other part in the proceedings; (2) a complete participant uses covert observation and tries to become a member of the group being researched, to see the group's world from the inside; (3) a participant observer shadows someone – this approach can be used if one doesn't have the necessary credentials to be a complete participant; (4) a practitioner researcher is someone who already has a job and decides to put on a researcher's 'hat' to investigate their own work organisation. In this study, observation was very important as it helped in collecting data on people's everyday actions as they visited PHCN offices, as well as their ideas, feelings and reactions. The author also obtained a glimpse of how the system was working in practice and the surrounding conditions that support it, such as manpower and electricity supply. According to the situation, the author presented himself as an outside observer, both overtly and covertly. For example, while the author was among ordinary citizens and public servants, he concealed his identity as a researcher in order to observe people more closely

without them knowing and feeling uncomfortable. During each visit to the PHCN office, the author conducted a one-hour observation, particularly at the registration and vending centres. A total of approximately sixteen hours of observation was conducted and four pages of observation notes were compiled. The following section discusses the final method of data collection which is document analysis.

4.5.2.3.   Document Analysis

Documents can be treated as another source of data, as alternatives to observations and interviews. Oates (2006) distinguishes between two types of document: (1) documents already existing prior to the research, such as the documents found in most organisations: production schedules, profit-and-loss accounts, internal telephone directories, production manuals and so on; (2) research-generated documents, which are compiled solely for the purposes of the research task and that would not otherwise have existed. For this research, the author collected and reviewed various documents in order to understand the implementation of ICT4D intervention in Nigeria. These documents can be categorised into the following: (1) development and poverty eradication documents; (2) statistical data; (3) ICT policy plan; and (4) ICT4D project details and profiles of research sites. The documents played a significant role in establishing triangulation and in maintaining the chain of evidence.

Some of the documents were obtained from the Internet while others were provided by the respective organisations. In the first category of documents, the author investigated the concept of poverty in the context of Nigeria, and the plans and strategies drawn up by the government to overcome poverty. Documents in this category include the National Economic Empowerment Development Strategy (NEEDS), the Power Sector Reform Act and the Vision 20:2020. In the category of statistical data, the author collected quantifiable data about people living with various (un)freedoms and other related indicators. For example, the author gathered statistical data to ascertain the percentage of the Nigerian population with (or without) education and email access, and other (un)freedoms and arrangements, in order to understand the poverty situation in the country. ICT policy documents were revised in order to understand the link drawn between the implementation of the ICT projects and poverty alleviation strategies.

Lastly, documents about project details were revised in order to gain information on specific functionalities that each system provides in order to contribute to the development processes. Research site profiles were revised in order to understand specific details of the context where the systems were being implemented. Accessing government documents such as development strategies and ICT4D implementation documents was vital to understand the government's vision of ICT for development and the government's plans for achieving the vision. In addition, it helped in understanding how the case-study organisation used in this research was accommodated in the country's vision and plans.

Document Category	Example
Development and poverty eradication documents	• Vision 2020 • Power Sector Reform Act
Statistical Data	• Human Development Index • Country's population index
ICT policy plan	ICT implementation strategy and Policy
ICT4D project detail	Conceptual Model of CEMS

Table 4 - 5 Documents used as sources of data collection

4.6.   Theoretical Framework

The interpretive tradition maintains that there are no right or wrong theories; rather, the theories should be assessed according to how *"interesting"* they are (Walsham, 1993). Hence, Silva (1997) notes that researchers following the interpretive paradigm can only claim that the theories presented are interesting to them and expect them to be interesting to those involved in the same research domain. The interpretivist theory will be made available to the public and people will be able to judge, assess and alter the theory. The outcome is not theory generation but rather an intersubjective process in which a theory is being built upon by members of the research domain (Silva, 1997). With regard to the application of theory in interpretive research, Walsham (1995) identifies the different uses of theory: (1) a guide to design and collect data; (2) as part of an iterative process between data analysis and collection; (3) as the final product of research. Yin (1993) points out the importance of carefully formulating theoretical propositions before conducting a case-study, because they will inform the design of the case at the later stage. Sen's (1999) capability approach framework guided the collection and analysis of data although Sen (1999) does not make a link between the capability approach and the data necessary to apply it, whether as a tool for collecting data or for analysing it. In this study, the author provides

table (see table 4-6) to highlight the main concepts of the capability approach framework and the guiding questions that informed the data collection process.

Main concepts of the capability approach	Research questions guiding data collection
Commodities	-Which technological artefacts and features (CEMS resources) do consumers utilise in gaining better access to electricity. i.e., what technological resources they use. What support functions (e.g., infrastructure and training) have enabled them to be involved in the initiation, implementation and usage of CEMS? -What are the rationales behind the implementation of the CEMS?
Capabilities	-What potential capabilities can be enhanced as a result of citizens' involvement in the initiation, implementation and usage of CEMS? -What are the relationships between the various capabilities that are enabled or restricted? -Who may be disadvantaged by the deprivation of these capabilities?
Conversion Factors	-What conversion factors (personal, social, environmental) enable or restrict individual capabilities generated as a result of the initiation, implementation and usage of CEMS? -What conversion factors enable or impede the initiation of CEMS? -What conversion factors enable or restrict the agency of consumers during the initiation of CEMS?

Table 4-6 Linkage between the main concepts of the capability approach and questions guiding data collection

4.6.1. Challenges in operationalising the CA

As this study is about operationalising the CA, the following section summarises some methodological challenges in this endeavour.

4.6.1.1.   Designing the Research Instrument

While one might not expect blueprints, templates and textbook prescriptions of how to frame discussion topics or frame research questions to extract relevant information for a CA evaluative space, there appears to be an apparent lack of guidance in the CA literature on

framing research design for relevant information from a CA perspective. This goes to the core of its insufficient operationalisation. Rather than each researcher having to start from scratch, it would have been useful to refer to previous experiences on methods for framing questions in a relevant way (i.e. building on experiences of others).

4.6.1.2.   Understanding of Different Concepts

Several concepts at the heart of the development discourse in general and in the CA in particular were difficult for many participants to comprehend, even the term *"capabilities"'*. So, again, certain meanings relating to capabilities were inferred when analysing responses (e.g. *"Computer"* has been interpreted as capability of having access to and using ICT).

4.7.   Qualitative Modes of Analysis

According to Oates (2006), qualitative data analysis involves abstracting from the research data the verbal, visual or aural themes and patterns that a researcher thinks are important to the research topic. The common thread is that all qualitative modes of analysis are concerned primarily with textual analysis (whether verbal or written) (Avison and Pries-Heje, 2006). Although there are many different modes of analysis in qualitative research, data analysis in this thesis was performed using thematic analysis due to its theoretical freedom and flexibility as a useful research tool which can potentially provide a rich and detailed, yet complex, account of data (Boyatzis, 1998).

Interview data were transcribed and then analysed following the set of principles of thematic analysis (Braun and Clarke, 2006). The process began with meticulous reading and re-reading of the interview transcripts in order to gain an overview of the main themes discussed by the participants. This allowed, in the first instance, the classification of similar material and insights to be captured (Dey, 1993). Next, a set of themes were generated in relation to the theoretical concepts described in chapter three and any further insights gained from the reading of the material. The interview data were then coded according to these themes (Boyatzis, 1998; Dey, 1993). Also, field notes taken during observations were analysed using codes that were the same as those used for the participants. Significant quotations and relevant themes from the transcripts are described in Table 4 – 7 to clarify the thematic coding exercise. The process of analysis approach taken broadly follows the set

of guidelines and principles given in relation to the conducting of thematic data analysis when attempting qualitative field studies (Braun & Clark, 2006). Similarly, documents (government reports, internet reports and newspaper reports) were analysed with a view to discovering the research setting, the background data on the ICT4D projects and the different agencies and actors involved in the project, as well as the underlying social and cultural issues that may emerge in the research setting. In this case, a broad classification of the documentary data was made, which identified the data as either background information to the ICT project, related to the research setting or from the popular press, pointing to social and cultural issues influencing the initiation and implementation of the ICT4D project. The results of the analyses are presented in the following chapter. In presenting the results, the capability approach framework was used to systematically explain the empirical findings in the context of developing countries.

Walsham (1993) argues that empirical research without theory produces a series of anecdotes, and the research aims to avoid this by using theory both to guide the fieldwork carried out and to provide ways of synthesising and communicating the results. Therefore, theory provides a framework for the critical understanding of a phenomenon and a basis for considering how what is unknown might be organised (Silverman 2000). In conclusion, in this chapter, the author has presented the details of the epistemological and methodological perspectives underlined in this study including the research process, research methods, data collection techniques and modes of data analysis.

Sample Themes	Meaning and Sources	Sample-coded excerpts from transcripts/ field notes
Modernisation	Source: Pre-reading of transcript and Literature Review Concepts Meaning: Refers to the Federal Governments procedures put in place in line with the World Bank's neo-liberal framework to initiate and implements CEMS in order to improve the functioning of the public sector.	*"Various regimes, in the distant past, paid little attention to the sector but in the recent decades, subsequent regimes have put in billions of naira to reverse the neglect and mismanagement which has characterised the sector….. Our commitment is to bring an end to our nation's stunted growth and usher in the fresh air of prosperity by pursuing a new era of sector-wide reform which is driven by improved service delivery to every class of customers in the Nigerian electricity sector"* *"There is no way government can stop the power sector reform process….stopping it will mean cutting off the support with get from World Bank and other donor agencies…the government needs money and you know the power sector reform is one condition we must satisfy in order to get the help we need from international bodies"*
Wealth Incentives	Source: Pre-reading of transcript Meaning: Refers to how politicians top PHCN officials, business men drove the design and implementation for wealth gains	*Strong indications have emerged that the on-going reform in the power sector is under threat from top Nigerian businessmen and the government* *"Some top PHCN officials usually receive a certain percentage of the profits in return for doing little more than ensuring that their preferred contractor wins the contract each time a development project comes of for tender in PHCN….after all, they dominate the development machinery of PHCN".* *"CEMS is just one of those projects that have been pushed for implementation by this ogas in order to have the opportunity of gaining petty contracts, such as supplying computers by establishing their own businesses, awarding contracts to themselves, immediate relatives and friends"*
Political Value	Source: Pre-reading of transcript Meaning: Refers to how politicians drove the design and implementation to achieve political goals	*"As you know, the discussion of the 2011 elections heated up and PDP (ruling party) knew that they had nothing to show off, hence the politicians quickly approve CEMS at the state meeting in order to use the project as a strategy of gaining popularity and votes and they succeeded"* *"Many politicians are battling to have the new system supplied to their constituencies they represent in order to garner the support of their people and win elections"*
Educational Capabilities	Sources: Pre-reading of transcript and Theoretical Concepts Meaning: Refers to the opportunities consumers have to expand their knowledge as a regard to the implementation of CEMS	*"we learnt that electricity is our right, and it was illegal to pay anyone or middleman for electricity supply without being registered to PHCN…at least now we know because a majority of us in this street were always paying one Uncle NEPA who we thought was a PHCN staffs for our electricity not knowing that he was a tout who had friends that were working in PHCN and that is how they were extorting money from us without the knowledge of PHCN"* *"With the introduction of this new system, I now use energy saving bulbs in order to save cost. This is not only good for me, but also for the environment…"* *"Most of the time, I am the one at home and my husband is always away. I have had to learn how to*

		purchase vouchers online. So now, all my husband does is keep his debit card with me"
Corruption	Sources: Pre-reading of transcript/ Literature Review and Theoretical Concepts Meaning: This refers to the influence of bribery, nepotism etc. on the ability of consumer's to access electricity services using CEMS	*"After making the application online, you are supposed to show the confirmation at any PHCN office, but some of their (PHCN) staff are still requesting bribes in order to have your application fully approved or else it can take years due to amount of applications in the queue"* *"Many of us, the poor, can't use the computer. In my area, I don't have a computer and internet access. The only café we have is very slow and hardly functions. I asked a staff member what I should do and he said it's not a problem. He said I should give him some money, my house address and I should come back tomorrow…I think CEMS is just a new form of extorting money from the poor" [consumer]*

Table 4 – 7 Sample of themes and transcript excerpts used in thematic coding

CHAPTER FIVE – CASE-STUDY FINDINGS

"For me context is the key - from that comes the understanding of everything."

-Kenneth Noland

5.   Introduction

In this chapter, the background details of where the study was conducted - Nigeria - are presented. In the following section, the author presents the physical location of the setting and the corresponding demographic profile of the population. The subsequent section describes the social, economic and political context of Nigeria. Next, an overview of the national poverty reduction strategy followed by the ICT policy and strategy in Nigeria is presented. In the ensuing section, the author discusses electricity in Nigeria and how the Government was planning to improve service delivery in the electricity sector. Lastly, the author introduces CEMS as a case-study and concludes with the research findings relating to respondents' perceptions of the contributions of CEMS to human development. The description of the CEMS project relates to a national-level intervention, but when reporting on the research findings the emphasis shifts to the citizens. The guiding assumption here is that ICT4D implementation is shaped by various contextual factors such as education, human resources, infrastructure, economy, historical conditions and the political environment.

5.1.   Geographic and Demographic Profile

5.1.1. Geographic Profile

Nigeria is situated in the West African region on the Gulf of Guinea. It has a total area of 923,768 km, making it the thirty-second largest country in the world. It has a coastline of at least 853km and borders with Benin (773 km), Cameroon (1,690 km), Chad (87 km) and Niger (1,497 km). Nigeria lies between longitudes 2° and 15°E and latitudes 4° and 14°N. Nigeria is administratively divided into thirty-six states and one federal capital territory, which are presided over by seven hundred and seventy-four local governments. Abuja city is the capital of Nigeria. The government structure and public institutions follow the administrative division of the country. The country is divided into four geopolitical zones: North, South, East and West. The three largest major ethnic groups in Nigeria are the Hausa, Igbo and Yoruba. In terms of religion Nigeria is roughly fifty per cent Muslim and forty per

cent Christian, with ten per cent practising traditional religions. Nigeria is defined by its tropical climate characterised by two principal seasons: rainy and dry.

Figure 5 – 1 Map of Nigeria

5.1.2. Demographic Profile

The demographic profile is significant for an understanding of the needs of the targeted population of ICT4D implementation. It is also important in the planning and implementation of policy programs aimed at improving the quality of life. Table 5-1 below provides some significant indicators of the demographic profile of Nigeria.

Indicator	Figure
Population	155,215,573
Population density	164.8/km^2
Population growth rate (%)	1.935%
Life expectancy at birth	47.56 years

Table 5 – 1 Demographics

The population is unevenly distributed, with Lagos and Kano the most populous states in the country, with populations of 7,937,932 and 13,383,682 respectively. Generally, the majority of the population live in the cities and urban areas. The official language is English, although Nigeria has more than 250 ethnic groups, with varying languages and customs, creating a country of rich ethnic diversity.

5.2.   Socio-historical, Political and Economic Context

Following the British colonisation of Nigeria which ended in 1960, the nation has faced an era of social, economic and political change. The country experienced a three-year civil war (1967-1970) which had an adverse impact on economic development. Furthermore, during the civil war period in 1967, the structure of government was decentralised with the creation of 12 states out of the four regions (Northern, Western, Eastern and Southern) in the country. Later, in 1976, 19 further states were created and the local governments were officially referred to as the third tier of government. The military ruled for almost 13 years before a democratic regime was installed in 1979. The military era was characterised by high rates of corruption, poverty and abuse of human rights.

However, in 1984, the military once again seized power from the civilians and there have since been four military regimes: Buhari's regime, Babangida's regime, Abacha's regime and Abdul-Salam's regime. The post-independence era was characterised by periods of economic instability. During the period 1979-1980, the economy was facing a recession resulting in high rates of inflation and unemployment coupled with an increased level of poverty. Consequently, in 1984, various adjustment and recovery programmes aimed at dealing with the crisis were introduced, including the building of schools, hospitals, roads etc. These efforts were largely donor-funded and subjected to the framework of the IMF structural adjustment programs. In 1999, Nigeria re-achieved democracy, ending almost 33 years of military rule. Since then, Nigeria has shown marked improvements in attempts to curb corruption and enhance economic development. However, the country's development is still undermined by other social problems such as crime, corruption, gender disparities, terrorism, a weak system of justice and a bureaucratic provision of public services.

5.3.   Economic Indicators

Nigeria is amongst the poorest countries in sub-Saharan Africa, and is ranked 142 out of 169 countries in the Human Development Index (UNDP, 2010). Over 70 per cent of Nigerians are now classified as poor, and 35 per cent of them live in absolute poverty (IFAD, 2009). The majority of the rural poor depend primarily on agriculture as their major source of income (CIA, 2011). Technologies such as ploughs, tractors, pesticides and fertilisers are rarely used in the family-based farming sector. Nigeria has vast areas of underutilised arable land.

Agriculture makes the largest contribution to GDP, accounting for about 40 per cent of it. Agriculture contributed 5.74 per cent to the GDP growth in the fourth quarter of 2011 as against 6.08 per cent in the corresponding period of 2010 (Ibrahim, 2012). The oil boom of the 1970s led Nigeria to abandon its strong light manufacturing and agricultural bases in favour of a harmful dependence on crude oil. In 2000, oil and gas exports made up about 83% of federal government revenue and more than 98% of export earnings. New oil wealth and the concurrent decline of other economic sectors fuelled massive migration to the cities and led to increasingly widespread poverty, especially in rural areas (LOC, 2008).

 A collapse of basic infrastructure and social services since the early 1980s accompanied this trend. By 2000, Nigeria's per capita income had plunged to about one quarter of its mid-1970s high, below the level at independence. Along with the endemic malaise of Nigeria's non-oil sectors, the economy continues to witness a massive growth of *"informal sector"* economic activities, estimated by some to be as high as 75% of the total economy. The oil sector contributed 13.54 per cent in the fourth quarter of 2011 as against 14.64 per cent to real GDP in the fourth quarter of 2010 (Ibrahim, 2012). President Goodluck Jonathan has set up an economic team that includes reputable and experienced individuals and has announced plans to improve fiscal management and increase economic growth and transparency. Slow implementation of reforms and lack of infrastructure are key impediments to growth. The government is working towards developing stronger public-private partnerships for power, agriculture and roads.

5.4.   Education Indicators

Nigeria provides free, government-supported education, but attendance is not compulsory at any level, and certain groups, such as nomads and the handicapped, are under-served. The education system consists of six years of primary school, three years of junior secondary school, three years of senior secondary school, and four years of university education leading to a bachelor's degree. The rate of secondary school attendance is 32% for males and 27% for females (LOC, 2008). In 2004 the Nigerian National Planning Commission described the country's education system as *"dysfunctional."* Reasons for this characterisation included decaying institutions and ill-prepared graduates (LOC, 2008). Low levels of literacy have implications in other sectors as well as for development initiatives

such as those of ICT4D. Specifically, within the public sector in general, the capacity to deliver effective public services remains limited, and the majority of its employees do not have university degrees. Trained people are distributed unevenly over the country, with the majority of the better-educated employees based in the central administration at Abuja, Lagos and Port Harcourt. I now discuss the government strategy for solving some of the above-mentioned problems and poverty in general.

5.5.   National Poverty Reduction Strategy

In order to alleviate poverty, the government of Nigeria adopted a home-grown poverty reduction strategy plan (PRSP) called NEEDS (National Economic and Empowerment Development Strategy). It is Nigeria's version of the World Bank/IMF Poverty Reduction Strategy Papers and a medium-term strategy (2003-07) that is derived from the country's long-term goals of poverty reduction, wealth creation, employment generation and value re-orientation. A related initiative on the state level is the State Economic Empowerment Development Strategy (SEEDS). The vision of NEEDS is to *"build a truly great African democratic country, politically united, integrated and stable, economically prosperous, socially organized, with equal opportunity for all, and responsibility from all, to become the catalyst of (African) Renaissance, and making adequate all-embracing contributions, sub-regionally, regionally, and globally"* (NEEDS, 2004, pg. viii). NEEDS focuses on four key strategies: reorienting values, reducing poverty, creating wealth, and generating employment. NEEDS recognises the use of ICT as a tool for poverty eradication and supporting other development interventions.

5.6.   ICTs in Nigeria

The use of ICTs in Nigeria can be traced back to the early 1950s when electronic media and print were introduced (Idowu et al., 2003). At that time, only the private sector demonstrated ICT initiatives and there was no major ICT policy; hence, full awareness of the technology was absent (ibid). Currently, the use of ICTs has spread across the private and public sectors for administrative operations and service efficiency. According to a survey conducted by the World Bank (2003), the use of ICTs in Nigeria has shown improvements, with the number of computers rising from 4.8 to 6.8 per 1,000 inhabitants between 1999 and 2001. In addition, the cost of Internet access has been driven below the $1 (US) per

hour line and the software development industry has been given a boost by policy and infrastructural support (Sesen, 2007). However, the growth of ICTs is uneven with up to 70 per cent of Nigeria's population residing in the rural areas with no access to the Internet due to the lack of telecommunication infrastructure and electricity (Adomi, 2005). Since 1999, the government has increased efforts to expand ICT with the aim of improving the flow of information from the government to its citizens, from citizens to government and within government departments, by setting up relevant internet and intranet systems for federal, state and local governments including the adoption of a national policy on ICT, enacting a National Communication Act and appointing an independent regulatory body (Adomi, 2005).

5.7. ICT Policy and Strategies

Nigeria is amongst the nations to have developed national ICT policies to serve as a guideline for ICT integration in all facets of society. In 1999, the National Policy on Telecommunications was launched. This policy document was a significant step in the development of the infrastructural base for ICT in Nigeria. The Nigeria National Policy for Information Technology followed in 2001, along with the creation of the National Information Technology Development Agency (NITDA), which was tasked with the implementation of the policy. The long-term strategic vision for the ICT sector was elaborated in the National Development Plan entitled *"The Nigeria Vision 20:2020"* which states that, by 2020, Nigeria will be one of the 20 largest economies in the world, able to consolidate its leadership role in Africa and establish itself as a significant player in the global economic and political arena. According to the document:

"The increasing globalisation driven by ICT makes it imperative for Nigeria as an emerging market to irreversibly consider the application and promotion of ICT strategy to facilitate its rapid growth and development. This will involve the development of a vibrant ICT sector to drive and expand the national production frontiers in agriculture, manufacturing and service sectors. It would also require the application of new knowledge to drive other soft sectors: governance, entertainment, public services, media sector tourism, et cetera" (Vision 2020, 2010, pg. 222).

The Vision 20:2020 document further acknowledges the following:

"In respect of knowledge and digital divide the situation remains worrisome. This is, in terms of knowledge generation, penetration of ICT, access to and usage of Internet and telephone penetration (fixed and mobile) and physical infrastructure. The knowledge and digital divide cuts across geographical, gender and cultural dimensions. It exists among the 36 states of the Federation plus the Federal Capital Territory, the 774 local governments, rural and urban areas, men and women, rich and poor, young and old, able bodied and disabled, illiterates and educated" (Vision 2020, 2010, pg. 222).

The National ICT policy has been developed in support of the development goals of Nigeria's Vision 20:2020. The vision of the policy document is *"Nigeria as a knowledge-based and globally competitive society"* (NPFIT, 2012, pg. 12). The ICT policy emphasises the need to ensure that ICT resources are readily available to promote efficient national development. 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 of public administration for all citizens, bringing transparency to government processes within the country (NPFIT, 2012). However, the implementation of this policy has been uneven with some initiatives already at the stage of implementation and others still lagging behind. This thesis explores one of those efforts where ICT is used to enhance transparency in the electricity sector.

5.8.   Electricity in Nigeria

 "We are not happy for paying government agencies like PHCN for services not rendered, we won't stop at reporting PHCN both to God and to higher authorities for maltreating us. All we know is that one day, God will deliver us from their hands"[3] The above quotation powerfully reflects the desperation and helplessness of householders in Nigeria. Nigeria is West Africa's biggest oil producer and holds an estimated one third of Africa's gas reserves (Baker, 2008). Yet, about 60% of its population lack access to electricity to satisfy their basic

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[3] Seye Adeniyi, 'Ibadan: Odo-Oba, Ilupeju, Kudetis residents lament lack of electricity, water', Tribune, 22 May 2012, http://tribune.com.ng/index.php/community-news/41236-ibadan-odo-oba-ilupeju-kudetis-residents-lament-lack-of-electricity-water

needs. The country is in an era of unprecedented dependence on stand-by generators. The minority connected to the electricity grid are faced with an epileptic supply of electricity. Power supply is often rationed, meaning that communities receive electricity only on alternate days for a certain number of hours. The body responsible for the supply of power is the government-controlled institution referred to as the Power Holding Company of Nigeria (PHCN). Reasons for the poor service delivery by PHCN include underfunding by the government, poor accountability, political jobbery, nepotism, inefficiency amongst PHCN staff and, especially, corruption. There is a call by proponents of this view to fully privatise PHCN in order to allow private participation that will allow competition and the flow of capital into the sector. This issue has generated daily comment and intense public debate in the electronic and print media.

Despite the shortage of funding, there is large-scale financial mismanagement and embezzlement of funds by PHCN officials. In the 2010 National Poll which was jointly organised by NOI-Gallup, the survey results show that a majority of Nigerians perceive PHCN and the Police Force as the most corrupt institutions in the country (Chima, 2011). It is also important to note that many consumers, including individuals, corporate organisations and government agencies, have evaded paying electricity bills, thus owing PHCN huge sums of money. The reason for this was the lack of a consistent record system of consumers who have access to electricity. In 2001, PHCN introduced a cash collection policy called Revenue Cycle Management (RCM) that involves using private organisations such as designated banks to collect revenue. The consumers were expected to pay their bills at their banks. This was to facilitate regular and prompt payment of bills, as consumers would not have to travel far outside their areas searching for PHCN offices to settle their outstanding bills. However, many still claimed they were too occupied to visit the banks in order to settle their bills. By October 2011, the debts had accumulated to a total of US$628 million (Shosanya, 2011).

Another issue contributing to the epileptic power supply is the tampering with and stealing of PHCN equipment for private gain by both consumers and PHCN officials. Furthermore, due to the lack of accountability and corruption that has characterised many successive regimes, PHCN equipment was neglected and not properly maintained or replaced, and this resulted in its obsolescence. For any or all of the reasons mentioned above, PHCN has failed

to provide a stable power supply to Nigerians. However, PHCN's inefficiency is not limited to its epileptic supply of electricity but also encompasses the oppressive actions of its officials and the blatant corruption that hinders consumers' access to electricity supply. PHCN officials can be unjust in carrying out their duties. Sometimes, they cut off an entire apartment or block of flats occupied by several householders even if only one tenant has refused to pay their electricity bills. PHCN officials simply disconnect the house from the grid serving the area[4]. Although there are some instances in which consumers have failed to settle their bills due to their inability to pay, PHCN usually prompt this behaviour by sending overestimated bills that do not reflect how much electricity consumers have consumed in a month[5].

Also, PHCN officials do not consistently record monthly meter readings because it is very expensive, especially where access is difficult. Many rural communities do not have a proper house number or even an efficient postal service (Yusuf, 2006). Due to this, many consumers do not receive their bills at the appropriate time, thus causing many poor people to accumulate debts that are difficult to pay. PHCN officials insist on consumers paying the inflated bills and reconnection fees before such billing errors are corrected[6]. The consumer either negotiates payments with PHCN officials or remains without electricity. Further, PHCN officials rarely deal with consumers' distress calls, on the grounds that they are faced with a shortage of staff or lack the necessary equipment (Olukoju, 2004). They frequently expect and even demand a bribe for agreeing to fix a fault. Also, an application for electricity that is made manually by filling in the application form rarely receives prompt attention; sometimes the files go missing (Olukoju, 2004). Such false delays can be avoided when consumers are willing to pay a bribe. The same situation applies to cases where faulty equipment, such as transformers serving a specific location, needs to be replaced. PHCN

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[4] Dodondawa, T (2012) Electricity consumers accuse PHCN of corruption, Tribune Newspaper, Accessed 01/10/2012 http: http://tribune.com.ng/index.php/energy/44585-electricity-consumers-accuse-phcn-of-corruption

[5] Olusola-Obasa, B (2012) CCUs to address complaints of over-estimated billing, Punch Newspaper, Accessed 01/10/2012 http://www.punchng.com/feature/power-talkback/ccus-to-address-complaints-of-over-estimated-billing/

[6] Opara, S (2012) How PHCN rips off electricity consumers, Punch Newspaper, Accessed 03/10/2012 http:// http://www.punchng.com/business/financial-punch/metering-how-phcn-rips-off-electricity-consumers/

officials usually claim that such equipment is not available for replacement unless consumers are willing to yield to the demand for gratuities (Alabi, 2012). Also, PHCN officials have been accused of intentionally tampering with the electricity supply to a particular area in order to make unethical demands on consumers[7]. The above-mentioned irregularities and epileptic supply of electricity naturally provoke various responses from consumers, ranging from acceptance to various forms of resistance. These vary from individual to individual and also depend on the social, financial and geographical location and other circumstances. Some consumers take the extreme step of violently resisting PHCN officials when they attempt to disconnect consumers with outstanding arrears[8]. Others leave their electrical appliances switched on even when not in use so as to psychologically compensate themselves for the high billing rate and sporadic power supply (Dickson, 2008). When this happens, useful power that could have been properly utilised elsewhere is wasted. In cases of power outage, consumers usually visit their local PHCN official to report complaints. The malfunctioning of equipment is a major worry to consumers due to PHCN's action of delaying replacements or repairs if no bribe is paid (Olukoju, 2004). Community unions often intervene by organising a collection of money from consumers in that particular community.

Apparently, such funds are paid to PHCN officials to effect repairs or cover the cost of replacing faulty or old equipment. Such transactions are not officially recorded, and are sometimes denied by PHCN officials (Olukoju, 2004). It is also important to mention that some corrupt leaders often take advantage of this situation to defraud householders for their own personal gain. For example, PHCN disconnected an entire estate as an act of punishment when it discovered that some community leaders had illegally collected an undisclosed amount of money from householders to buy new power equipment that was still functional (Olukoju, 2004). Many consumers have now resorted to various acts of self-help. They make illegal connections by connecting themselves after PHCN officials have

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[7] Alabi, A. (2012) Corruption flashpoints in PHCN operation system, Tribune, Accessed 03/10/2012 http://www.tribune.com.ng/index.php/opinion/39281-corruption-flashpoints-in-phcn-operation-system

[8] Adebusuyi, D. (2012) Fayemi's aide assaults PHCN officials for disconnecting Govt House, Daily Trust, Accessed 03/10/2012 http:// http://www.dailytrust.com.ng/index.php/news/170870-fayemis-aide-assaults-phcn-officials-for-disconnecting-govt-house?device=iphone

disconnected them. This unscrupulous act is done with impunity, sometimes with the help of PHCN officials[9]. Others go further, conspiring with PHCN workers to tamper with meters to stop them recording consumption or doing so in a very slow manner. Poorer people, who do not have the financial power to pay large bribes to PHCN officials for access to power supply, have had to make do with lanterns and candles. Worse still, there have been cases of adulterated kerosene exploding when householders light hurricane lanterns. In the same vein, the use of candles has resulted in fire outbreaks when such candles are accidentally left to burn overnight[10]. These cases are all a result of PHCN's brazen acts of corruption and inefficiency, which have led to the loss of innocent lives and properties.

Furthermore, the inability of the poorer communities to access electricity has resulted in blackouts in the community. Burglaries and armed robberies are committed by anti-social elements under these conditions[11]. The aforementioned narrative has summarised the state of affairs regarding access to electricity in Nigeria. The new government has promised to deal with the problem of access and epileptic supply of electricity, with assistance coming from donors such as the World Bank and the Department for International Development (DFID) (House of Commons, 2010).

5.9.   Tackling the PHCN Calamity: The Nigerian Government Initiatives

In 2005, the World Bank estimated that, for Nigeria to increase its electricity supply and provide transparent access to 75 per cent of its citizens, an investment of US$10 billion was required (Baker, 2008). In that same year, the former president, Olusegun Obasanjo, agreed to the World Bank's suggestion and formulated the Power Sector Reform Act under the tenets of the Bank's major neoliberal economic reform program. An investment of up to US$16 billion was made with the promise of reforming the power sector to provide better

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[9] Olusoloa-Obasa, B (2012) Meter bypass, tampering threaten PPM initiative, Punch, Accessed 03/10/2012 http://www.punchng.com/feature/power-talkback/meter-bypass-tampering-threaten-ppm-initiative/

[10] Ogunesan, T (2012) How fire killed father, 2 kids in Ibadan, Tribune, Accessed 03/10/2012, http:// http://tribune.com.ng/index.php/features/46691-how-fire-killed-father-2-kids-in-ibadan

[11] Akinboyewa, O (2012) Bitter encounters at dark alleys of Nigerian cities, Pilot Nigeria, Accessed 03/10/2012 http://nigerianpilot.com/index.php/-other-section/perspective/6188

and transparent electricity access to Nigerians. The Power Sector Reform Act aims to enable private companies to participate in electricity generation, transmission and distribution. It includes the restructuring and privatisation of the electricity generation and distribution assets of the National Electric Power Authority (NEPA). NEPA, which used to be the body responsible for power supply, was unbundled into seven generation companies (GenCos), one transmission company (TransysCo), and eleven distribution companies (Discos). The structure came into effect to form what is now called the Power Holding Company of Nigeria (PHCN). At that time, the Nigeria Electricity Regulatory Commission (NERC) was established to monitor and regulate the power sector as it underwent these changes (NERC, 2009). However, these investments did not yield any significant improvement and were marred by corruption; hence they were discontinued[12]. In March 2008, Ngozi Okonjo-Iweala, who was a minister during Obasanjo's regime and is the present finance minister, and the former minister of solid minerals, Oby Ezekwesili, currently African vice-president of the World Bank, appeared before a probe panel on corruption set up by the House of Representatives (Gillies, 2009). Both of them played leading roles in power sector reform.

Some interviewees who were involved in the previous privatisation effort mentioned that the World Bank was silent about the corrupt practices that occurred during the failed privatisation process. In August 2010, President Goodluck Jonathan recommenced the process of implementing the 2005 Power Sector Reform Act. The President declared that his administration would fight for electricity to be available to all citizens[13]. The Presidential Task Force on Power was established and a roadmap for power sector reform was published (Ezigbo, 2010). In his speech[14] on the implementation of the Power Sector Reform Act, the President said:

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[12] See Dr Sam Amadi's interviews on the short comings in Power Sector Reforms, Leadership, 23/07/2012 http://allafrica.com/stories/201207230690.html

[13] See Vanguard 29th May, 2011 Jonathan's inauguration address, Vanguard, Accessed 01/10/2012 http://www.vanguardngr.com/2011/05/over-40-heads-of-state-witness-jonathans-inauguration-amid-tight-security/

[14] In Road Map for Power Sector Reform, Lagos, August 26, 2010 http://www.nigeriaelectricityprivatisation.com/wp-content/uploads/downloads/2011/03/Roadmap-for-Power-Sector-Reform-Full-Version

"Various regimes, in the distant past, paid little attention to the sector but in the recent decades, subsequent regimes have put in billions of naira to reverse the neglect and mismanagement which has characterised the sector..... Our commitment is to bring an end to our nation's stunted growth and usher in the fresh air of prosperity by pursuing a new era of sector-wide reform which is driven by improved service delivery to every class of customers in the Nigerian electricity sector"

The federal government is jointly executing the power sector reform with an investment of US$100 million, while the World Bank is making available US$200 million (Ezigbo, 2010). According to the report on the road map to power sector reform (2010), the faithful implementation of the report will result in better access to electricity, transparency, greater participation by industry participants, better service delivery to consumers, better welfare packages for workers and, more significantly, active public dialogue and engagement between FG, stakeholders and civil society. An investigation revealed that a majority of the consumers were not happy with the privatisation reforms of the power sector; rather, they saw it as an avenue enabling top officials of the new government to secure grants that are prone to embezzlement:

"There is no privatisation programme that has worked in Nigeria. NITEL, MTEL and the rest of them have collapsed because of the corruption happening in these reforms....The government continue privatising without even consulting the people that voted them in...There is a cabal in every regime benefiting from the failed programs" (Consumer A)

PHCN workers also expressed their dissatisfaction with the continuing privatisation programme. According to a PHCN staff member who is also a member of the National Union of Electricity Employees (NUEE):

"We will not support it because it is another avenue for stealing money and that is why they took up the initiative without any dialogue with stakeholders...... Let them make public the investigation of the $16 billion spent by the Federal Government on National Integrated Power Projects (NIPP) and other corrupt practices in the previous privatisation schemes"

In response, the federal government boldly stated in the national dailies that, despite the mounting opposition to the privatisation, there was no going back with the program, and they invited investors to take advantage of the liberal investment climate in Nigeria[15]. One of the interviewees from NERC asserted that:

"There is no way government can stop the power sector reform process….stopping it will mean cutting off the support with get from World Bank and other donor agencies…the government needs money and you know the power sector reform is one condition we must satisfy in order to get the help we need from international bodies"

In line with the Power Sector Reform Act, the Computerised Electricity Management System (CEMS) was proposed and introduced in 2006; this system was designed to computerise all aspects of electricity management, particularly to replace the old manual system with its national electrification program. The next section continues with the description of CEMS and presentation of research findings supported by explanations and illustrative quotes. It is divided into five subsections. The first subjection focuses on the timeline for the design and implementation of CEMS. The second subsection focuses on the consequences of CEMS for the local communication and supporting enterprises. The third section focuses on the consequences for PHCN, the consumer and electricity consumption patterns. The last two sections present the findings on the consequences of corruption for the usage and infrastructural sustainability of CEMS.

5.10. The Computerised Electricity Management System

As this thesis is not a formative evaluation of how well CEMS has functioned, it does not offer a critique of its operations but reports on challenges faced by citizens, as expressed by them during the research. The CEMS project was initiated without the involvement of consumers and civil society. CEMS was primarily proposed by the World Bank and IMF; however, it was hijacked by a number of key public officials from PHCN and the Ministry of Power, as highlighted in press reports:

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[15] No going back on privatization, Jonathan assures investors, Leadership Newspaper, 10/09/2012, http://www.leadership.ng/nga/articles/34580/2012/09/10/no_going_back_power_sector_privatisation_jonathan.html

"Strong indications have emerged that the on-going reform in the power sector is under threat from top Nigerian businessmen and the government "(Punch, 2012)

"The plan to ensure efficient and effective electricity service delivery may have been hijacked by opposing interest groups in the power sector" (Punch, 2012a)

Interviews with staff of PHCN involved in the power sector reform confirmed the press reports stating that powerful individuals seem to have a personal interest in the project rather than ensuring its success. It was suggested that the president take drastic actions to deal with these powerful groups, who are also politicians of the ruling party, in order to achieve maximum service to Nigerians. Many of the respondents felt let down by FG, PHCN and the politicians due to these reports. The citizens expected to be included in the project and provided with adequate information about the new system; in fact, citizens were excluded and unable to voice their opinions concerning system outcomes such as information and documentation, budgets and the allocation of funds. The government indicated that participation should be given high priority in the project but, arguably, none of the stakeholders from the demand side were included in the requirements and design of the new system.

Many of the respondents interviewed noted that they had never heard of the new system until their elected representative informed them that the analogue meters would be replaced by the prepaid system. Citizens rely on their elected representatives for most of their community needs because they provide a significant link between the federal authority and the communities they serve. The respondents felt that PHCN had decided to convince only the politicians in order to legitimise the CEMS project. Questions were raised regarding the intentions of the elected representatives, which resulted in a loss of confidence in the mandate given to them. Several consumers mentioned that, since the politicians had won their elections, it was now more difficult to find them since many of them spent more time serving various party political interests rather than the interests of the community in general:

"We voted them (politicians) in, but their interest is not for the community, but their personal gains. We only accepted new system because we were desperate for a better electricity supply" (Consumer B)

"There is a cabal benefiting from this project and I'm sure that is why they don't want us involved because we will expose them" (consumer D)

When asked about this issue of a lack of consumer participation, a top official of PHCN stated:

"During the system demonstration forum which involved the supply stakeholders, there was a lot of conflict 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"

The CEMS project is regarded as a very lucrative one with a lot of money involved. Top PHCN officials seemed unable to resist it because of the financial strings attached to its purchase and uptake; hence they lobbied politicians and ministers with the promise that their states and constituencies would be given the highest priorities during implementation. Recent review of the CEMS project by the Nigeria Electricity Regulatory Commission uncovered the gross mismanagement of a certain N2.9 billion ($17,856,700) approved by the Federal Government as a subsidy for the supply and installation of prepaid meters to electricity consumers across Nigeria by top PHCN officials (ThisdayLive, 2012). One of the staff of PHCN who works in the procurement department explained how contracts are usually shared amongst top government officials alongside embezzlement of funds. He gave the example of the previous rural electrification project to explain how politicians and officials hijacked the list of contractors originally pre-qualified by the public procurement committee of the agency and substituted it with their companies. He further disclosed that none of the pre-qualified companies benefited from the solar-based system contracts which were finally awarded to forty-five companies belonging to some officials of the agency and members of the National Assembly.

Another PHCN staff member confirmed this information by further revealing how top PHCN officials have become simply *"the sleeping partners"* of contractors that actually run the business:

"Some top PHCN officials usually receive a certain percentage of the profits in return for doing little more than ensuring that their preferred contractor wins the contract each time a development project comes for tender in PHCN….after all, they dominate the development machinery of PHCN".

"CEMS is just one of those projects that have been pushed for implementation by this ogas in order to have the opportunity of gaining petty contracts, such as supplying computers by establishing their own businesses, awarding contracts to themselves, immediate relatives and friends"

There was also apparent political interest in the flag of CEMS projects because the politicians wanted to win the mandates of their people by showing off the new project; CEMS was approved at the Federal Executive Council (FEC) meeting:

"As you know, the discussion of the 2011 elections heated up and PDP (ruling party) knew that they had nothing to show off, hence the politicians quickly approve CEMS at the state meeting in order to use the project as a strategy of gaining popularity and votes and they succeeded" (PHCN staff A)

It was further recommended in the meeting that higher priorities be given to the urban settlements over the rural settlements during implementation. Many banks with an interest in the project lobbied for this recommendation as it would be more convenient and easier to do business with PHCN were the project to be substantially implemented in the urban areas. The banks conducted their lobbying by promising politicians and top PHCN officials loans whenever they applied. With regard to this recommendation, a NERC official noted that:

"This is an appropriate arrangement that was done for the interest of the citizens…PHCN will get the supports from banks because they (PHCN) can now show them cash flow"

Many consumers living in the satellite towns felt cheated by such a recommendation. A consumer echoed:

"What is the difference between the urban and rural settlements? Is this project for the citizens as a whole or for a particular class of people? I don't think there is any project in this country that has favoured us, the poor people" (Consumer C)

The initial plan during the project's initiation was for an open bidding process that would allow local firms to participate in the project for the design, supply, implementation and maintenance of the new system. However, in the later stages, the ENL consortium became the preferred choice. It was reported that both firms colluded and bribed top government and project officials in order to secure the contract. Project officials failed to sell bid documents to local contractors or found trivial reasons to disqualify them. One local contractor, who was unable to secure the contract, said:

"It's very unfortunate that local contractors are not given the chance to participate and grow, instead of providing a transparent environment for everyone, it is all about who bids the highest bribe"

5.10.1.   System Design and Implementation
5.10.1.1.   Between 2006 and 2009

Following the approval by FEC, ENL started to develop a database for electricity management with a record of each consumer who would also be supplied with a prepaid meter showing how much electricity the customer was consuming. ENL also developed a website that allowed consumers to view their account, apply for a new electricity supply and also pay their electricity bills. Other channels for paying their bills included using the mobile payment system or attending the PHCN office in person. Within a few months, the system design took shape and was demonstrated to higher officials. ENL received inspiration and support from the immediate higher authorities, who also suggested some modifications. The project was further improved to enable mobile payment, so that consumers could simply pay their electricity bills using their mobile phones. After all the modifications had been made, the final prototype of the system was presented to the Minister of Power and other higher authorities; they were very pleased with it. Based on the positive evaluation, a five-year memorandum of understanding (MOU) was signed between the federal government and PHCN, and the Ministry of Finance passed a one-year budget for the project with an agreement that, every year, funds would be remitted to ENL.

As per the MOU, a pilot would be covered in two phases in four states, namely Lagos, Abuja, Jos and Port Harcourt, with each stretching over 10 months, followed by the next cohort and a period of joint consolidation. The hardware supply was the responsibility of ENL, who also had the responsibility for providing services regarding software customisation and support, capacity-building and implementation support. 70 per cent of the cost went on hardware and software, with the rest on capacity-building. After signing the MOU, the first task of ENL was to create a team of IT specialists and electricians who would be responsible for building the capabilities of PHCN staff and providing all kinds of implementation support and *'hand-holding'.* It was planned to run the existing manual systems alongside CEMS to avoid any unforeseen incidents during the transitional period. The manual system would then be phased out. The first phase of the pilot project was successfully in progress and was expected to expand across the country gradually. However, the story did not end well. Suddenly, in February 2009, the CEMS project was suspended. A top PHCN official disclosed that the project had been suspended due to the slow pace of its implementation and the need for another contractor:

"FG suspended the project to source for other contractors because we believe ENL alone cannot handle the project" (PHCN staff B)

5.10.1.2.   From 2009 to the Present

Although PHCN disclosed that the CEMS project was initially suspended in order to source another contractor because of the magnitude of the project, further investigations revealed that the project, which is regarded as a *"rich business"*, was suspended in order to allow some top officials to determine the people involved. According to a PHCN official:

…Because of the money involved in the project and conflicting interest, some management staffs connived and tried to push ENL away. With their political powers and connections they lobbied and secured the contract to continue the implementation of the system"

In September, 2009, the suspension was lifted and a new contractor called MOMAS systems was engaged at a cost twice that of the ENL contract. Many consumers were left uninformed about the suspension of the project in 2009. The suspension resulted in delays and unavailability of the prepaid systems for consumers, as shown in this quote:

"I made all applications online and I have been provided with electricity but I am still yet to receive the prepaid systems for the past 5 months….at the moment I am on estimated billing that doesn't tally with my consumption" (Consumer E)

Furthermore, a dispute occurred between the ENL consortium and the new contractor. ENL had refused to share the project infrastructure with MOMAS on the basis that PHCN had unlawfully terminated their contract and PHCN owed it money for the previous system maintenance and upgrade it had provided. According to a member of staff of ENL:

"After we signed the contract agreement, we were paid a first instalment with the agreement that subsequent payments will be paid. But when the time came in for the remaining payments, PHCN didn't pay. We wrote official letters to them with no response. At least with the inclusion of MOMAS in the project now, we now know that those top PHCN officials were the ones embezzling our funds and frustrating our payments because they wanted MOMAS in"

The denial of payment disrupted the implementation project at that time because, as months passed, ENL resources were depleted and they couldn't pay staff salaries and continue with the installation and supply of equipment. Further, ENL had denied MOMAS access to the building where the main server is located, thus delaying full implementation of the system in other areas. It was reported that MOMAS even tried to bribe ENL staff in order to integrate their database:

"We found out one day that our own staff was paid to add MOMAS prepaid systems to our database. Our prepaid numbers start with 0418, so we found out and deleted them" (ENL staff A)

 At the end of 2009, without any interventions from the government and PHCN, MOMAS decided to purchase an alternative system. According to a PHCN official:

"The Ogas (top officials) are silent about this issue because they are benefiting from the dispute. Because of this issue, the project was suspended and many consumers couldn't get the prepaid system so they continued using the analogue and estimated billing which is where most of these our bosses make extra money. The bribes that are collected by junior staff are also remitted to them"

At the time of writing, a number of consumers were already using MOMAS prepaid systems. But the dispute with ENL has meant that consumers with MOMAS prepaid systems can only vend at PHCN vending centres set up by MOMAS while consumers with ENL prepaid systems can only vend at PHCN vending centres set up by ENL. According to a consumer who owns a prepaid system supplied by MOMAS:

"Every time I want to recharge, I have to drive for about 30mins to PHCN office at Gwarinpa… This is wrong, consumers should be able to recharge at any PHCN office anywhere"

Further, the online payment system is available only for consumers with ENL systems. Many consumers also complained about inequalities in the new system. A consumer comments:

"Why are the consumers with ENL system given upper choices such as mobile payments…are they different from the consumers with MOMAS system?"

However, many consumers with MOMAS systems complained of its low quality. According to a MOMAS staff member, many of the top management staff contracted the work of supplying computer equipment and prepaid systems to their friends and relatives:

"Many of these ogas (top officials) have given their friends the contract of CEMS. A lot of them do not have any idea about computers or the kind of prepaid systems we need. They have supplied computers and equipment that are not compatible with the Nigeria environment and that is why we are today having a lot of complaints from consumers about prepaid systems or computer equipment blowing up"

He further stated that, on several occasions, some of these people who had been given the work were even collecting the money without executing the job. According to a community leader, several delegations have visited the PHCN authorities in their local area to complain about the absence of the system; no meaningful response has been forthcoming. One community leader stated:

"All the authorities do is make promises upon promises that never come true; we are used to getting false promises in Nigeria"

After a long wait without any investigation into why the systems weren't implemented in those communities, the World Bank came to the aid of the communities by implementing the new system and supplying the prepaid billing systems for free. However, consumers are still charged US$314 to have the prepaid system installed in their homes, although they are supposed to receive it free of charge. With regard to this issue, a PHCN official revealed that:

"It is actually illegal to charge for the prepaid system but with the shortage of funds we are experiencing, we need to raise money so that we could pay the contractors to supply and implement the new system in other areas"

The first phase of the project has been implemented in major states around the country and is still on-going. About 2 million people have been registered electronically on CEMS and about 800,000 prepaid billing systems have been installed at the time of writing. The second phase of the project is still on-going at the time of writing but its progress has been hampered by the lack of funding.

5.10.2.   Consequences for the Local Community and Supporting Enterprises

Due to the high rate of unemployment in the country, PHCN were determined to find and train unemployed people as they felt it would be a very great incentive for Nigeria to create a pool of entrepreneurs who would contribute to strengthening the socio-economic development processes and help bridge the *"digital divide".* PHCN took out several advertisements highlighting job opportunities for IT graduates in the national dailies. There were great expectations across the country that the project would help in reducing the number of unemployed graduates. Local contractors were hired to supply computer equipment such as laptops, desktops, printers and other telecommunication appliances. Local casual workers were employed to support PHCN operations throughout the country. The ENL consortium hired and trained local electricians for the installation of the prepaid billing system in collaboration with the National Power Training Institute of Nigeria (NAPTIN). These electricians are usually roadside electricians who have no formal education but have acquired their skills through vocational training. The majority of the electricians employed were on temporary contracts; therefore they saw this job as a way of enhancing their curricula vitae. Some were even considering applying for the positions of permanent

staff after their contract was completed. Further, PHCN hired a fair percentage of women with the broader aim of contributing to women's empowerment. A majority of the staff trained to use the computerised sales system in issuing electricity vouchers were women. One of the female employees noted:

"After we were trained I then realised I had the interest to become more proficient in computer skills, at the moment I am enrolled for a short-term computer course every weekend"

The technical department was also expanded due to the new system, and graduates with IT backgrounds were employed in areas such as databases, networking, trouble-shooting and so on. According to a citizen who recently obtained employment:

"With the little time I have stayed there, I have acquired a lot of experience in terms of networking and databases, although we hardly have breaks because we need to be present all the time to maintain the servers"

However, other citizens were said to be unhappy with the conduct of the recruitment exercise for the project. Many citizens with the appropriate qualifications were unable to get the jobs because they had no inner connections who could secure the jobs for them. One graduate stated:

"With my first class in computer science and also a certification in Oracle I didn't get the job. One of my friends whose uncle is a senator didn't even follow the normal process but was immediately hired".

However, the employment benefits to be gained from the CEMS project were said to have been subverted by senators, ministers, members of the House of Representatives and other people described as stakeholders who submitted their own candidates for the recruitment process. Reputed for his high principles, the Managing Director of PHCN was said to have initially resisted the imposition of such a huge number of job seekers on him, only to succumb later to the weight of persistent pressure from the top public office holders.

5.10.3.   Consequences for PHCN, the Consumer and Electricity Consumption Patterns

PHCN promoted the system by sponsoring media campaigns and demonstrations of the system for the general public and the legislators and representatives in the National Assembly. These institutional efforts were intended to promote the adoption and usage of the system. Various other campaigns were used to create awareness through the use of media such as posters, billboards, radio and television. The media campaigns were successful in prompting citizens to exercise their right to access to electricity and have their houses registered on the national database. According to a consumer:

"we learnt that electricity is our right, and it was illegal to pay anyone or middleman for electricity supply without being registered to PHCN…at least now we know because a majority of us in this street were always paying one Uncle NEPA who we thought was a PHCN staff member for our electricity not knowing that he was a tout who had friends that were working in PHCN and that is how they were extorting money from us without the knowledge of PHCN"

Furthermore, the consumers noted that the introduction of the new system has encouraged them to use computers and the Internet, especially women who were home all day and responsible for using most of the electricity:

"Most of the time, I am the one at home and my husband is always away. I have had to learn how to purchase vouchers online. So now, all my husband does is keep his debit card with me"

The PHCN website has been very beneficial to the consumers as they do not have to incur increased transport costs visiting PHCN offices. Sometimes, these bills are overestimated and sent to the consumers. With the new system, consumers no longer feel cheated as they pay only for the energy they have consumed; thus they pay their bills regularly. Furthermore, consumers are now cautious about electricity wastage and try as much as possible to manage the little electricity they can afford. According to one consumer:

"With the introduction of this new system, I now use energy saving bulbs in order to save cost. This is not only good for me, but also for the environment…"

Consumers also revealed their newly-acquired valid knowledge through the practical experience gained from using the prepaid systems. For example, having received the prepaid systems for the first time, householders used trial-and-error methods to determine which appliance consumed the most electricity by plugging and unplugging electrical appliances, switching them on one by one and monitoring the system to see how quickly the units were used up. As a result, householders learnt new consumption patterns and ways of saving electricity. Also, the introduction of the new system has allowed consumers easy access to opening bank accounts. Showing proof of bill payment for address verification was a prerequisite for opening a bank account according to the new regulations of the Central Bank of Nigeria. In the past, consumers would have to wait a long time to receive their bills due to the poor postal service in the country. Now consumers can simply go online to print their bill statement. Prior to the introduction of the prepaid billing system, PHCN officials normally visited every consumer's house, reading their meter and sending them their bill.

Lastly, the new system has allowed PHCN to manage electricity theft. According to a PHCN official:

"We trail these electricity thieves by checking the rate at which they recharge their meter within a certain period using our computerised recharge data bank. If his/her prepaid meter is registered with our own office and we check our data recharge bank and discover that he/she recharges every month but at the moment has not recharged for about four to five months, we take note of that meter's address and send out a task force team to inspect the prepaid meter. Occasionally the task force team discovers that the consumer has been bypassing the meter by not consuming electricity through the meter but via a wire that is directly connected to an electricity pole outside the premises"

5.10.4.   Corruption and Usage Consequences

It was reported by interviewees that PHCN staff usually extort bribes from consumers before and after they make their applications online. The link between CEMS and enhancing transparency was underscored by one of the consumers, who echoed the new forms of bribery associated with the new system:

"After making the application online, you are supposed to show the confirmation at any PHCN office, but some of their (PHCN) staff are still requesting bribes in order to have your

application fully approved or else it can take years due to amount of applications in the queue"

The majority of consumers further expressed disappointment at the failure of PHCN to install the prepaid system after they had applied for the facility. Observation during the fieldwork of this study reveals that a good number of PHCN offices do not have the new system in stock. It was reported that a truck full of the new prepaid systems destined for a particular community was diverted and supplied to the constituency of a high-ranking politician. A PHCN official noted that:

"Many politicians are battling to have the new system supplied to their constituencies they represent in order to garner the support of their people and win elections"

Also, some PHCN officials are reluctant to install the prepaid system because it has blocked one of the lucrative avenues of making illegal money. If consumers wish to have the prepaid system installed in their homes, they need to pay a large bribe to get the new meter; otherwise, they will have to continue with the analogue system. A consumer echoed that:

"With the new system, they (PHCN officials) can no longer threaten us with estimated bills or disconnection. This reality has become so uncomfortable for them and that's why they are behaving this way"

Another consumer voiced his frustration, stating:

"Can MTN (a telecom company) deny consumers their SIM cards? So why is it different with PHCN? We are really suffering a lot from PHCN and their epileptic power supply. For a cordial relationship to exist between PHCN and us, the new system should be made available to consumers"

Furthermore, many consumers noted that the new system did not favour the majority of the poor who have no access to computers or the Internet; rather, it was a way of exploiting them, as shown by the quotation below:

"Many of us, the poor, can't use the computer. In my area, I don't have a computer and internet access. The only café we have is very slow and hardly functions. I asked a staff member what I should do and he said it's not a problem. He said I should give him some

money, my house address and I should come back tomorrow…I think CEMS is just a new form of extorting money from the poor" [Consumer F]

Many PHCN officials have personal laptops with internet connections and were charging consumers who had no access to computers a certain amount of money to have their applications registered online. The same situation applies in cases where defective prepaid systems serving consumers need to be replaced. Although such equipment is supposed to be obtained from PHCN warehouses and provided to consumers free of charge, officials claim that they are unavailable. PHCN officials always take advantage of the desperation of consumers, who need electricity supplies for personal or business use, to extort money from them. One of the consumers asserted:

"I called PHCN officials to report a fault with my prepaid and the response they gave me was that a replacement was currently unavailable. I called one of the electricians aside and tipped him off and that was the end of the story"

Poor welfare packages and poverty are two factors involved in PHCN officials' attempts to make the acquisition of the new system difficult. According to one of the PHCN staff:

"With the little pay we receive, and given that the new system would deny us money, we have to look for other avenues of making money to cater for our families"

 When asked about this issue, a PHCN official indicated that many of PHCN's staff members have been working for 10 years and are yet to be confirmed as permanent members of staff. They are frustrated with the meagre pay they receive and look for other avenues to make money. He emphasised the need for the federal government to improve civil servants' remunerations and also create more public awareness about the dangers of corruption.

Further to the discussion related to bribery, a top PHCN official noted that most of the people collecting bribes from consumers were not genuine PHCN staff. He pointed out that:

"The major issue facing PHCN is the problem of impostors; a lot of people have taken advantage of PHCN's ineffective monitoring mechanism by falsely claiming to be PHCN staff. So some consumers just show up into any PHCN office to report their case to anyone. They do not try to find out if they are genuine PHCN workers or not and many fall victim"

Some PHCN officials connive with consumers to tamper with the prepaid system by programming it in such a way that it stops reading electricity consumption or does so in a very slow way. This is done in return for a huge payment; nevertheless, consumers either pay far less than what they should have paid for an accurate billing or, sometimes, nothing at all. A top PHCN official had something to say about this:

"You train a set of people (ad hoc workers) about this system in order to help them, but they pay you back by abusing the same system. Most of these electricians are collecting a lot of money to bypass this system and their clients are mostly large organisations that consume a lot of electricity. And to be frank, it is impossible to effectively monitor all these organisations"

Many consumers had mixed feelings about the bypassing of the system. One consumer noted:

"This is wrong, actually a PHCN electrician actually asked me if I wanted but I declined. It is very unfair to other consumers that pay for their electricity consumption. PHCN needs to really cleanse itself of corruption because its own staff are the ones informing consumers about the bypass"

Another consumer noted:

"I would bypass the system if I had the money, PHCN has ripped consumers off so much so its payback time for them"

In addition, the new system has allowed information to be easily accessible to decision-makers. Many PHCN officials favour their families and friends in order to speed up their applications; otherwise they are regarded as enemies of society. An interviewee commented:

"Jamaan ka, su ne arzikin ka", meaning [your wealth is measured by the amount of people you have helped]" (Consumer G)

Such actions are regarded as MAN KNOW MAN in Nigeria. Many of PHCN's staff obtained their jobs with the help of politicians and top government functionaries, so they are

expected to reciprocate whenever the politicians ask for help. The majority of our interviewees admitted that they have received some form of help from friends or colleagues working at PHCN or the ministries. In Nigeria, such practices are considered normal and it is believed that certain classes of people such as traditional rulers deserve favours, as echoed in this statement:

"If the emir of Kano applies today, we need to process it today because he is our king and we respect him a lot" [PHCN official]

The concept of MAN KNOW MAN has been very unfavourable to other consumers who do not have contacts in the government or PHCN. One consumer noted:

"I cannot get my application approved for my shop because I don't know any big man"

5.10.5.   Corruption and Infrastructural Consequences

There are many instances when the main server develops a fault and, as a result of this, many consumers are unable to use the online web application, purchase prepaid vouchers or load electricity units onto their billing system. Thus many will have to remain without electricity until the server is restored. Consumers normally lodge complaints with their local PHCN office. The malfunctioning of equipment such as the CEMS server is a major worry to the community, given PHCN's attitude of delaying replacement or repairs if no source of support is forthcoming from the management. In some cases, they delay repairs if no form of inducement is offered by the consumer. According to an IT official in PHCN, most of the funds allocated by the government for the maintenance and support of CEMS are usually embezzled. He stated:

"Every month the government allocates a particular amount of money for the maintenance of these systems, but the Ogas [top officials] usually eat them. Ok, you see, the server is the central point. The database and everything is there, all service centres are connected to the server. The server is supposed to be working 24 hours. Can you believe there is no standby generator when there is no electricity? Also the inverters are not working properly and that is the reason why sometimes consumers go to purchase vouchers and they are told that the network is bad. Every time, there has to be an IT person in the server room because when electricity goes off we have to go and switch on the generator manually and then switch on the server again. This has been happening for a year now." (IT official A)

Furthermore, the online and mobile payment system was suspended due to irregularities committed by PHCN officials. A PHCN official stated:

"Some people who had access to the mobile recharge bank were selling the PINS [personal identification number] to consumers before PHCN printed them out for consumers to buy. So many consumers were buying these recharge cards not knowing they had already been used. Even PHCN did not know"

Consumers were never informed about this and many fell victim to this fraud when purchasing prepaid vouchers. One of the consumers echoed his disappointment:

"I bought the voucher and tried to recharge it on the prepaid system but it wasn't working. I complained but they told me I was lying. It wasn't until many others complained that they tried to check it…and up till now they have not refunded us"

Some consumers took their complaints to the newly created PHCN anti-corruption unit. The anti-corruption unit (ATU) was charged with cracking down on corruption and making those practising it accountable for any offence committed. However, no investigations had been undertaken at the time of writing. Many consumers noted that the inefficiency of the anti-corruption unit in investigating cases made it practically impossible for consumers to hold PHCN staff members accountable since the same corrupt officials were the ones in charge of the unit. Other consumers declined to complain to the police and the anti-corruption unit because they have no trust in them. The same situation applies to the online payment system:

"The online recharge tokens that were to be used were not programmed on the server because the server was completely down. But some people got those tokens and sold them to a vendor who automatically uploaded them to the website. So many consumers were actually buying electricity tokens that were not working" (PHCN staff C)

A PHCN official confirmed that many consumers are yet to be refunded and believes that a cabal is benefiting in corrupt ways from the introduction of the CEMS. He also acknowledges the lack of will to deal with corruption; rather, computerisation was only introduced to make people feel PHCN was trying hard to tackle corruption:

"The government and PHCN are not sincere in tackling corruption. It's impossible, all the ogas are beneficiaries of corruption and you don't expected them to cut off the hand that feeds them"

There were also apparent issues of staff shortages and a lack of training for PHCN staff, resulting in delays in replacement and repairs, as illustrated in this quote:

"After the implementation of CEMS in 2006, we received just one day's training because there were not sufficient funds to organise several workshops. Recently, the consultants that installed the system organised a training workshop for the IT staff in South Africa, but some of the managers hijacked it; rather than allowing the staff to go, they used it as an opportunity to travel with their family" (IT staff B)

The IT staff admitted having to learn about the new system on their own by reading the manuals. A government official expressed the view that corruption in the public sector is a way of life and many believe that, if they don't exploit the opportunity when it arrives, they will never get such an opportunity again.

CHAPTER SIX – CASE-STUDY ANALYSIS

"Conducting data analysis is like drinking a fine wine. It is important to swirl and sniff the wine, to unpack the complex bouquet and to appreciate the experience. Gulping the wine doesn't work"

-Daniel. B. Wright

6. Introduction

The case-study conducted in this research (CEMS project) will be analysed in this chapter. The relationship between ICT and development has been analysed from different perspectives. At the macro-level, there are econometric studies that have attempted to illustrate the relationship between ICT, economic growth and economic indicators. At the micro-level, there are various studies which have used different frameworks, many of them focusing on statistics such as number of users, reflecting an individualist or consumerist model of society (Menou & Taylor, 2006). For the purpose of this thesis, which takes a human development approach, the focus of the analysis is on individuals (micro-level). As presented in chapter four, the analysis of the case-study was conducted following the principles of thematic analysis where the researcher discovered themes that were used to give an insightful interpretation of participants' accounts. Three separate but related themes emerged from the analysis of the case-study. One theme focused on the drivers seen to be influencing the initiation of ICT4D intervention. The second theme that emerged from the data was more related to the potential contributions of an ICT-enabled initiative to socio-economic development. The final theme that emerged focused on the conditions that enable or hinder citizens in terms of benefiting from the developmental potentials of the ICT-enabled initiative.

Some of these themes found in the data are similar to those identified in ICT4D literature, although the case-study analysis provides a more critical contextual understanding of the themes in a developing-country context. The intention is to discuss clearly the underlying power relations that lead to the initiation and implementation of ICT4D interventions in developing countries and how these power relations may lead to certain development outcomes for ordinary citizens. The next three sections discuss the three separate themes that emerged from the case-study analysis.

6.1.   Drivers of the Adoption of CEMS in the Nigeria Context

This section briefly describes the various agendas behind the adoption of CEMS. The different themes that emerged relating to these agendas are categorised as modernisation, political value and wealth incentive.

6.1.1. Modernisation

According to the findings of this study, one of the major reasons for the initiation and implementation of CEMS was to comply with the World Bank's neoliberal framework which is assumed to help the government improve the functioning of the public sector with the use of ICTs by improving upon an existing level of service delivery. More importantly, privatisation and good governance are promoted as key drivers of ICTs in developing countries in general. Not surprisingly, as illustrated in the case, it was a critical reason for the federal government's initiation of the CEMS project. The government believes in the World Bank's imperative that ICT interventions should be part of its broader power sector reform if it is to achieve success. Further, it was assumed by the federal government that, by complying with the World Bank directives, it would be able to create a favourable impression for the sake of the beneficiaries. The detailed findings of the study show that the Nigerian government is dependent on the World Bank's funding; thus, it could not reject the World Bank's directives despite previous failed privatisation programs in the public sector.

 As in many other developing countries, the CEMS project was initiated in order to maintain a cordial relationship between the government and World Bank, hence allowing Nigeria to remain in the World Bank's 'good books' among the countries receiving aid. For example, the Kenyan government has been commended by the World Bank for its continued devolution of government with promises of a long-standing relationship and financial support for making necessary reforms that will improve the lives of the citizens (All Africa, 2012). Further, Nigeria's economy is experiencing a financial crisis and the country has debts of millions of US dollars, meaning that the government had no option but to initiate the CEMS project in order to secure funding from the World Bank which would be needed to support not only the privatisation programs but also other suspended projects. Such an approach has been used previously by the federal government in the financial sector to attract World Bank funding. For example, in 2009 Nigeria faced serious financial crises and

was given a sum of $500 million dollars in the form of budgetary support as a result of undertaking policy reforms as requested by the Bank (World Bank, 2012).

6.1.2. Political Value

ICT projects such as CEMS usually have high *"political value"*, especially in terms of holding or gaining political power. Usually, the ministers and politicians who are members of the ruling party dominate the policy arena. They have their own personal criteria apart from those of the World Bank, and these guide the approval of projects in general. Findings of the study show that the CEMS project was actually approved by the ministers through the constitutional power bestowed on them in order to show off the project to their constituencies as a way of gaining cheap political relevance and popularity, especially for those planning to seek political office in the future. It is reported that all politicians who find themselves in the seat of power know that corruption is the major issue affecting consumers' access to electricity; however, rather than tackling this problem, they leave the sector in an even worse state than they found it and, around election time, they start initiating projects and using them as a campaign tool, telling Nigerians that, as soon as their government is returned to power, it will totally revamp the electricity sector in little or no time and will work with stakeholders in the sector to ensure that Nigerians receive an efficient electricity service delivery (Vanguard, 2009).

The detailed findings further show that leading politicians in parliament and their allies, who have the potential to hold powerful and strategic positions when the CEMS project is initiated, bribed top-level politicians and bureaucrats due to the economic and political benefits of the project. Such positions include the ability to decide to which areas, and to which groups, the benefits will go.

6.1.3. Wealth Incentives

It is interesting to note that lucrative projects such as CEMS present opportunities for bureaucrats and politicians to gain personal benefits. Top PHCN officials pushed for the implementation of CEMS due to the vast amount of funding that would be allocated; this is an easy way of stealing and embezzling public funds, as has occurred in previous failed power sector reforms. The case-study findings show that top PHCN officials used their financial and administrative power to lobby ministers by promising them a fair percentage

of implementation in their respective constituencies and bribing them to approve the project, a venture in which they actually succeeded. During the implementation of CEMS across the country, there were press reports indicating the misappropriation of up to US$18 million dollars meant for the implementation of CEMS across the country. Some other top PHCN officials have driven the implementation of CEMS in order to have the opportunity of gaining petty contracts, such as supplying computers, by establishing their own businesses and awarding contracts to themselves, immediate relatives and friends. Similarly, from the findings presented, top PHCN officials have simply become *partners to contractors* that actually run the business. The top PHCN officials usually receive a certain percentage of the profits in return for doing little more than ensuring that their preferred contractor wins the contract each time a development project comes up for tender in PHCN.

6.2.   Potential Contribution of CEMS to Socio-economic Development of Nigeria

This section discusses the developmental potential of CEMS for human development. The potential contributions of CEMS to development are broadly categorised into economic, good governance, political and educational potential.

6.2.1. Expected Economic Contributions

This subsection analyses the potential contributions the CEMS project could provide that would be of economic benefit to consumers. The expected contributions include easy access to opening bank accounts and employment opportunities.

6.2.1.1.   Easy Access to Opening Bank Accounts

One way in which CEMS is expected to provide economic benefits to consumers is through its ability to provide real-time and up-to-date electricity bills to consumers which can be used in commercial transactions which in turn will expand the country's financial sector. With CEMS, consumers now have easy access via the Internet to check and print out their electricity bills. In Nigerian banks, a convincing means of identification is required in order to open and operate an account. The electricity bill is expected to facilitate easy access to opening bank accounts because the identity and address of the person can be authenticated using the electricity bill. Findings of the case-study reveal that many consumers easily printed their bills from the Internet in order to open and operate bank accounts.

Now, consumers no longer have to wait for a long period to receive their bills due to the poor operation of the Nigerian postal service which is often hampered by poor road conditions (National Mirror, 2012). The easy access to bills has seen an increase in the rate at which bank accounts are being opened, which is a criterion for access to consumer credit such as bank loans; this has also given consumers the opportunity to save their money in a secure environment. However, it should be noted that the majority of consumers enjoying these benefits are usually those who already had CEMS deployed in their areas and were already using the system; hence, those without access to CEMS are unlikely to fully benefit from these expected contributions from CEMS.

6.2.1.2.   Employment Opportunities

The introduction of the new system involves a public-private partnership with PHCN registration and vending centres located across the country; hence it should generate income and employment opportunities for the citizens. The case-study indicated that Nigerian citizens benefited from the project in the form of temporary employment contracts and wages in return for supporting PHCN operations during the course of system implementation. Ad hoc staff, comprising local citizens, were engaged to support operations in the 36 states of the Federation. Gaining this employment provided further benefits to local citizens in terms of enhancing their curricula vitae, applying for better jobs in the future, and enrolling on short-term computer courses. However, it is not expected that everyone will benefit from this employment opportunity since, in Nigeria, powerful stakeholders including ministers, senators, House of Representatives members and other top public officials usually subvert the recruitment process of public institutions by submitting names of the prospective candidates (Punch Newspaper, 2010).

Consequently, the candidates of powerful public officials obtained the jobs to support the operations of CEMS without fulfilling the due process formalities such as aptitude tests and interviews. Furthermore, the findings of the study show that consumers were further excluded from participating in the bidding process of the CEMS project, which would have provided employment to small entrepreneurs, as top PHCN officials had already chosen the contractor who would be in charge of the project.

6.2.2. Expected Contributions to Good Governance

This section analyses the potential contributions of the CEMS project to good governance, accountability and transparency. The expected contributions include reduction in the harassment and extortion of citizens, electricity theft control, reduction in embezzlement of funds, holding public officials accountable and improving the relationship between the government and citizens

6.2.2.1.   Reduction in the Harassment and Extortion of Citizens

Many consumers applied for the prepaid system believing that it would eliminate estimated billing and prevent harassment and extortion by PHCN officials. From this perspective, citizens wanted transparency and the ability to avoid harsh treatment in their dealings with PHCN authorities. According to the case-study findings, CEMS has helped to liberate the consumers from the burden of overestimated billings. The prepaid billing meter was designed in such a way that consumers can see the amount of electricity they have consumed and thus ostensibly develop enough confidence in the system to start paying their bills, monitoring their consumption and modifying their behaviour.

The study further shows that consumers are now free from the hassles of bribery and extortion during the connection and disconnection periods. Now, consumers are no longer threatened with disconnection and extortion as the new system automatically stops the flow of electricity if a consumer uses up his/her electricity units. This situation is evidently due to the abolition of cash transactions and the reduction in extensive human dealings.

On the other hand, the findings of the study show that, while the system has blocked some avenues for extorting money from consumers, corrupt PHCN officials have found other avenues to continue extorting money from the citizens. The findings illustrate that consumers are not totally free from harassment and extortion as corrupt PHCN officials are persistently reluctant to process citizens' applications or provide or replace their prepaid meters unless inducements are forthcoming.

6.2.2.2.   Electricity Theft Control

CEMS is expected to expand the consumer's freedom by controlling the theft of electricity. The supply-side actors believe that PHCN's anti-corruption units will be able to confirm consumers' identities and trace those offenders tapping electricity without paying. From a

policy perspective, electricity theft control will allow genuine consumers to receive a high-quality electricity supply and not feel cheated by electricity thieves. In the findings of the case-study, the new system has not totally solved electricity theft by default but it has provided PHCN with a means of managing theft by analysing the consumption and purchasing patterns of customers, and site visits are performed if any irregularities are detected. On the other hand, the study indicates that corrupt PHCN officials who have direct access to the system were helping consumers abuse the system in return for a huge bribe by programming the prepaid meter in such a way that the true electricity consumption is not recorded.

6.2.2.3.   Reduction in Embezzlement of Funds

It is expected that CEMS will reduce the misappropriation of electricity revenue by corrupt public officials. The first measure put in place by CEMS to remove this iniquity was to eliminate cash transactions and introduce payment channels such as web payments, mobile payments and the use of banks. The case-study findings reveal that consumers now have a real opportunity to pay their bills without hassle from corrupt PHCN officials. There has been an increase in the annual electricity income from about $62 million per annum before CEMS to an average of about $71.3 million per annum between 2006 and November 2011 following the introduction of CEMS. Thus, in general, it can be argued that there has been an increase in revenue due to a reduction in embezzlement and the automation of the payment system. On the other hand, the findings of the study show that embezzlement was not completely eradicated as many top PHCN officials were able to divert large sums of money allocated for the maintenance of CEMS, as previously discussed.

6.2.2.4.   Holding Public Officials Accountable

The administrators of CEMS recognise that fighting corruption in the electricity sector cannot be achieved solely via the use of technology. Thus, they have created an anti-corruption unit and sought the assistance of the police in investigating cases of corruption in electricity matters and the monitoring of activities of electricity criminals. The case-study findings reveal that, even though CEMS has provided some form of transparency, many consumers are unable to hold PHCN officials accountable even after reporting cases of irregularities they may have detected to the ATU and other anti-corruption bodies. For example, many consumers complained that the prepaid vouchers they bought from PHCN

had already been used. Even though it was discovered that some PHCN officials had defrauded the consumers, neither the police, nor ATU, nor even EFCC have carried out any serious investigations to prosecute the culprits. Meanwhile, other consumers do not even report their cases because they do not trust the ATU, believing that the same corrupt PHCN officials are the ones in charge of the anti-corruption units, while the police force has been reported to be the second most corrupt institution after PHCN.

6.2.2.5.   Improving the Relationship between the Government and Citizens

The government expects that the introduction of the new system will demonstrate to the consumers that PHCN is capable of providing an efficient and transparent delivery of services. This in turn will change the consumer's attitude to the government by increasing a sense of trust and reciprocity between consumers and PHCN, thus improving the motivation of staff and the image of PHCN. However, from the findings of this case-study, the relationship doesn't seem to be improving, as an increasing number of cases of corrupt practices by PHCN officials have been reported. For example, PHCN staff were reluctant to install the prepaid system in consumers' homes unless an inducement was forthcoming.

6.2.3. Expected Contribution to Political Liberties

This section analyses the potential contributions of the CEMS project to political liberties. The expected contributions include the citizen's ability to participate in public affairs.

6.2.3.1.   Participating in Public Affairs

During the initiation of the project, the World Bank emphasised the participation of demand-side actors as a key to the success of the project. From a policy perspective, participation will enable citizens to feel a sense of ownership in the project. In this regard, the emphasis is on the ability to engage in public affairs, to monitor government expenditures and to make public officials accountable. The findings of this case-study show that the decision to initiate CEMS was made without citizens' consent. It was a top-down decision and elected representatives failed to reflect the interest or desire of the community they were meant to represent. Recently, a serving lawmaker argued that most of the lawmakers cannot serve the interest of the nation because of how they emerged as lawmakers. He stated *"these people whose names were simply written and submitted as winners will always dance to the tunes of their godfathers rather than serve the national interest"* (Leadership, 2012). The majority of consumers only accepted the project after its

initiation because they were led to believe that the project would enhance transparency and provide access to electricity.

6.2.4. Expected Contribution to Education
This section analyses the potential contributions of the CEMS project to education. The expected contributions include the opportunities citizens have to increase their knowledge.

6.2.4.1.   Opportunities for Learning
From an educational perspective, the CEMS project is expected to have several positive outcomes for learning. The findings of the case-study reveal that consumers have now learnt new ways of saving electricity and money, thus contributing to a sustainable environment and living better lives. From a personal perspective, the new job experiences that the citizens were obtaining from the employment opportunities was of great benefit since citizens were able to expand their own knowledge and improve themselves as individuals. Others felt that working with the new system had made them more competitive in the market since using the system had encouraged them to register for short-term computing courses, hence enhancing their knowledge and employment prospects.

6.3.   Conditions that Enable or Hinder Citizens in Benefiting from the Developmental Potentials of the ICT-enabled Initiative
Based on the thematic analysis, this section discusses the various contextual conditions that could both enable or restrict the ability of citizens to transform CEMS into development outcomes. These themes are discussed below:

6.3.1. Infrastructure
Consumers raised several concerns about the infrastructure required to use the new system. A prerequisite for consumer choice was access to technology. Access to computers and the Internet was often concentrated in urban areas; although access is gradually reaching the rural areas, the majority of the poor do not have the skills to use this new system. Consumers who lack access to computers in their areas or have only limited access have to rely on their own ability to afford a computer and Internet access or go to an Internet café. However, low bandwidth and low information literacy have had an effect on their use of the system. Alternatively, because of access issues in the rural areas, many consumers prefer to visit PHCN offices and bribe the officials who have direct access to the system in order to enhance their chosen capabilities. Further, their ability to pay bribes to

PHCN officials depends on their financial power. Due to the lack of access in the rural areas, many consumers felt that the new system had been imposed upon them.

6.3.2. **Weak** Governance and Poor Planning

Many consumers, after applying for the prepaid systems, were not provided with the system due to its unavailability; this was the result of weak governance compounded by poor logistical planning and management. The situation was exacerbated by the embezzlement of the limited funds allocated for the project, resulting in an inability to pay the suppliers to provide the new systems and also an inability to pay the salaries of the workers responsible for the installation of the system in consumers' homes. Furthermore, no prepaid systems were supplied to consumers after registration because PHCN and ENL were locked in a dispute over payment which resulted in the suspension of the project. Poor governance in Nigeria means that disputes like the one between PHCN and ENL take years to resolve. For example, in 2003 the Nigeria government suspended the contract of a company that was supposed to serve as a consultant in the privatisation reform for alleged fraud. PHCN refused to pay the remainder of the full contract and the company sued PHCN, claiming to have a valid contract with the power company worth the sum of N150 billion ($ 923,623,000). As of 2011, the case was still pending in court (PM News Nigeria, 2011).

During the 9-month project suspension, many consumers continued to apply for the new system with the expectation of obtaining the prepaid system, only to be disappointed to hear that the new system was unavailable. A lack of accountability means that no official statement has yet been issued about the suspension of the project, so consumers were unaware when they registered that they had no chance of receiving their prepaid system in the near future. However, due to the persistence of consumers and civil bodies, the project suspension was lifted and a new contractor, MOMAS, was introduced to deal with the country's demands.

6.3.3. Lack of Participation

From the case-study findings, not only were the consumers not involved in the project initiation and design stage but information of public interest, e.g. information about the suspension of the project, was also systematically kept from public knowledge, even though consumers were capable of being engaged in accessing and using electricity services via

CEMS, hence participating at one level. This further denied the consumers the opportunity to monitor government activities within the project. In the case of CEMS, the lack of participation in the project no doubt resulted in mistrust between the citizens and the government, with some citizens questioning the main motive for the project.

6.3.4. Lack of Political Will

The study shows that there is a considerable lack of support and political will to tackle corruption in the electricity sector because various public actors, i. e., politicians and top civil officials, are benefiting from corruption through embezzlement, fraud and nepotism. It is believed that a system such as CEMS was only introduced to give a false impression that PHCN was trying to enhance transparency. In PHCN, many top government officials have enriched themselves and helped others enormously; hence, any junior official with such an opportunity will also want to enrich him/herself, as corruption is perceived to be a way of life and the opportunity to indulge in it comes once in a lifetime. For example, in the study there were reported cases of embezzlement of funds meant for purchasing new equipment and maintaining existing ones.

6.3.5. Lack of Motivation and Welfare Package

The poor welfare package of PHCN junior workers, as well as the frequent late payments of salaries, demoralised the junior workers. Many of the junior staff in PHCN have been working for over 10 years but are yet to be confirmed as permanent staff. The poor welfare conditions contribute to the widespread corruption in PHCN. This adversely affects their standard of living, health, and work productivity. Hence, they seek other means of catering for themselves and their families by extorting bribes, thus depriving consumers of the potential benefits of the system.

6.3.6. Weak Anti-corruption Bodies

Opportunities exist for corruption due to inefficient anti-corruption bodies and government processes. Many reported cases of fraud, bribery and other corrupt practices that were presented by consumers to the ATU, police force and the EFCC on electricity matters were never investigated. As noted earlier, some of the corrupt staff are also members of the ATU; furthermore, the EFCC and the police force are amongst the most corrupt institutions in Nigeria, so nothing serious is expected to emerge from any complaints. The inability of the anti-corruption units, police force and the ATU to investigate the complaints brought to

them has denied citizens the power to hold public officials accountable for any irregularities detected by the system.

6.3.7. Lack of Awareness about the Dangers of Corruption

The case-study findings show a lack of awareness of the dangers of corruption in society. Hence, some PHCN officials and consumers have accepted this vice as a normal activity and do not even realise that they are carrying out a corrupt practice when abusing the system. For example, PHCN officials and consumers see nepotism as a norm and cultural tradition. Many of them have taken the opportunity of using the new system to help friends and colleagues in their applications for electricity – otherwise, they are regarded as enemies of society. Others have helped people of higher classes in society in order to extend or show their loyalty. Although many people value this form of nepotism, it has had adverse impacts on those consumers who do not have contacts in PHCN, thus depriving them of better access to electricity. The lack of awareness of this social issue is affecting the transparent usage of the system.

6.3.8. Cooperation Issues

It was reported that ENL made deliberate efforts to prevent MOMAS from operating and accessing the data centre due to the outstanding payment that they are yet to receive and also to maintain control over the project. Staff felt that the top management team did little to deal with the situation because their interests had been compromised through corruption. Since MOMAS had no access to the data centre, they implemented an alternative data centre. The consumers with ENL prepaid systems can use the online and mobile payment systems while consumers with MOMAS prepaid systems can only use the online web system. Also, having two alternative systems means that consumers with ENL systems can only recharge at ENL vending points while consumers with MOMAS prepaid systems can only recharge at MOMAS vending points. Some participants were of the opinion that powerful vested interests continue to manipulate the situation, resulting in the lack of an integrated data centre that should serve all consumers irrespective of which prepaid system they own.

6.3.9. Corruption

Development in this case is dependent on people's ability to enjoy better access to electricity. However, corruption seems to be a significant constraint on such opportunities. Based on the analysis of the case-study, corrupt behaviour usually emerged during the interactions between political, bureaucratic and private actors, and occurs in different phases of the project. The follow section presents an analysis of corruption in the design, implementation and usage phase of the CEMS system.

6.3.9.1.   Design Phase

This section presents an analysis of the corrupt practices occurring during the interactions between different actors in the initiation and design stage of the CEMS project. The interactions are further categorised into public-public *(involves only public actors)* and public-private *(involves only public and private actors)* as presented below.

6.3.9.1.1.   Public and Public

From the case-study findings, the first corrupt interchanges are those between the PHCN officials and the politicians and ministers. Because of the financial strings attached to the project, PHCN officials lobbied politicians and ministers for project approval by promising them that their constituencies would be given the highest priority during system implementation, thus boosting their chances of winning elections by showcasing the project as an example of their efforts to improve their communities. The corruption exchange in these interactions is not monetary but rather a favour which is a non-material factor that is difficult to identify, although there were reported cases of bribery in monetary terms. These actions damage the democratic system in that consumers' lack of participation in the project resulted in consumers not trusting their political representatives anymore and even questioning their motives in accepting the project without community consultation.

6.3.9.1.2.   Public and Private

This type of corrupt interaction takes place between private and public actors. Various banks lobbied politicians to allow the project to be implemented with priority given to the cities and urban areas so as to allow convenient cash transactions with PHCN with the promise of giving supply-side actors loans whenever they needed them. This action deprived consumers in the satellite and rural areas of equitable access to the new system.

Further, the two private contractors in the project, ENL and MOMAS, lobbied and bribed government and PHCN officials. Hence, there was no bidding process for the project as the two companies had become the preferred choices in return for a percentage of the profits and a guarantee that the officials concerned would have some influence on the decision-making process. These actions further deprived other contractors of the ability to participate in the economic activities of the country.

6.3.9.2.   Implementation Phase

This section presents an analysis of the corrupt practices occurring during the interactions between different actors in the implementation stage of CEMS project. The interactions are further categorised into public-public *(involves only public actors)* and public-consumer *(involves only public actors and consumers)* as presented below.

6.3.9.2.1.   Public and Public

The interactions between the public actors in this case-study were usually non-monetary; rather, they involved the exchange of favours. In terms of the implementation of the system, for example, PHCN officials actually fulfilled their promise to divert the implementation of the new system from a particular community to that of a serving politician in order to boost his chances of being re-elected in the 2011 elections.

6.3.9.2.2.   Public-Consumer

In the interactions between public and consumer, PHCN were illegally requiring consumers to pay for the prepaid system in order to have it installed in their homes. From a policy perspective, this practice runs counter to the *"free of charge"* nature of CEMS. Also, nepotism seems to be playing a huge part in the introduction of the new system. There was a public and consumer interaction where PHCN officials awarded the jobs of computer and prepaid system suppliers to members of family and friends. Many of those contracted to do these jobs had no prior experience of supplying computers; thus, many of the systems supplied were of poor quality and became faulty due to their incompatibility with the Nigerian environment.

6.3.9.3.   Usage Phase

This section presents an analysis of the corrupt practices that occurred during the interactions between different actors in the usage stage of CEMS project. The interactions are further categorised into public-public *(involves only public actors)* and public-consumer *(involves only public actors and consumers)* as presented below.

6.3.9.3.1.   Public and Public

From the findings of the case-study, top PHCN officials colluded with one another to embezzle funds allocated for the maintenance and sustainability of the system. The lack of funding due to embezzlement had adverse effects on the training and payment of IT staff and on system sustainability. This is turn affected consumers' ability to use the system, thus impeding the developmental potentials of the system. Furthermore, some PHCN officials colluded with one another to steal the PINs (personal identification numbers) for the online and mobile prepaid vouchers for personal benefit. Hence, many unwitting consumers were buying prepaid vouchers that had already been used. The actions deprived the consumers of a transparent access to electricity as promised by the new system.

6.3.9.3.2.   Public and Consumer

Many consumers complained that PHCN officials were requesting bribes before the consumers' applications for electricity supply had been fully approved. Others did not receive prepaid systems after applying for the facility. Sometimes the new system couldn't be provided to consumers due to its unavailability, or as a result of corrupt practices. Consumers referred to cases where PHCN officials with access to the prepaid storage centres either withheld the new system with the hope of extorting money from consumers or failed to deal with consumers' complaints about the new system unless inducements were forthcoming. This action had an adverse effect on the relationship between PHCN officials and consumers. With regard to nepotism, PHCN officials have taken advantage of the new system to help their families and friends with regard to electricity matters. For example, many PHCN officials were reported to be speeding up the electricity applications of friends and family relations. On some occasions, consumers have approached their friends and colleagues working in PHCN. Thus, this is a two-way interaction that deprives other consumers, who do not have those contacts, of equitable access to electricity. Further, PHCN officials extort a large number of bribes from consumers to bypass the new

prepaid system. On some occasions, consumers intentionally request PHCN to bypass the system by offering them bribes. This act was valued by some consumers because they believed that, in the past, PHCN had swindled them of substantial amounts of money and this was one way of paying them back, although others disagreed and saw it as illegal. Ultimately, however, many consumers wouldn't have known about this illegal act without PHCN officials informing them.

Drivers of CEMS project in Nigeria	Phases of CEMS Project Design and Implementation	Expected Contribution of CEMS Project to Development	Constraining Condition	Indications	Stakeholders Involved in Corruption Interactions
Modernisation Political Value Wealth Incentives	Project Initiation and Design	Participation Good Governance Economic Opportunities	Lacks of user participation Corruption Top down fashion of policy implementation	Dictation of policies by donor agencies Only supply side stakeholders involved in the project Capital Intensive Project Speedy approval of projects without due process Nepotism and selection of preferred contractors Bribery for appointments into project committees Bribery of decision makers to influence policy priorities	Public Actors: Top PHCN officials, Politicians Private Actors: Banks, Contractors
	Project Implementation	Education Opportunities Economic Opportunities	Sub-standard supply Lack of watch dog committee Poor workers welfare Corruption Inefficient contractors Lack of awareness on corruption Weak Infrastructure Contractors conflict Electricity	The supply of systems not meeting standards Failure to complete work Bribery by contractors to influence contract bid Under payment of workers Embezzlement of funds allocated for supporting infrastructures such as manpower, electricity and telecommunication infrastructures Politicians and top PHCN officials favouring one community over another in the implementation of the system Favouring friends and individuals for job employment due to the expansion of the IT department Poor telecommunication coverage, hence affecting the installation of network servers to support the systems Shortage of manpower for the implementation of the system	Public Actors: Top PHCN officials, Politicians Private Actors: Contractors Consumers

| | System Usage | Good Governance
Education Opportunities | Lack of skills
Corruption
Poor infrastructure
Poor workers welfare
Corruption | Illegal connections: fraudulent meter readings with prepaid systems
Prepaid Screen not showing electricity credits or consumptions, prepaid not accepting tokens
Consumers lack access and skills to make applications online. Furthermore, consumers are faced with network issues
Consumers need to pay a cost to PHCN officials for replacement and repairs of prepaid systems
Hijacking of training programs abroad by top PHCN officials
Stealing of funds meant for maintain computer infrastructures and hiring more staff
Electricity will be constant with the new system which is not the case.
Community members collecting money from consumers for systems that were not even faulty
PHCN doesn't visit consumers to check the systems
Consumers are made to pay for the replacement of old meters with the new prepaid systems.
Consumers cannot recharge their systems
Preferential treatment to friends when making applications for electricity
Consumers would have to wait a long way to get their applications processed
Hijacking prepaid vouchers (mobile/website) and selling them to consumers without being programmed and activated on the main server | Public actors: PHCN officials, electricians

Consumers |

Table 6 – 1 Summary of Case Study Analysis

CHAPTER SEVEN – DISCUSSION

"If there is anything in the universe that can't stand discussion, let it crack"

- Wendell Phillips

7. Introduction

In the previous chapter, a case-study analysis was presented to understand the drivers of ICT4D interventions in developing countries and their expected contributions to human development. Consequently, the purpose of this chapter is to discuss and examine the implications of the case analysis for three interrelated issues which are linked to the theory discussed earlier in chapter three: (1) the relationship between agency and policy-making; (2) the relationship between ICT and capabilities; (3) the conversion factors that enable or restrict citizens' ability to transform ICTs into capabilities. The summary of the discussion is shown in table 7 - 1.

7.1.   Policy-Making and Agency in ICT4D

The case analysis suggests that different drivers significantly influence the uptake of ICT4D interventions in developing countries. These drivers operate at two levels: (1) international; (2) local level. The following section discusses the initiation of ICT4D at these two levels, the power relations at play and their consequent implications for individual capabilities.

7.1.1. International domination of ICT4D

The case-study analysis suggests that the primary reason for the initiation and implementation of CEMS was the emergence of privatisation in the electricity sector (World Bank, 2004); ICT4D literature identified the same major factor driving the adoption of ICTs in developing countries. From this perspective, the economic aspect tends to be emphasised. This was particularly evident in the case of CEMS, which paid attention to revenue generation through the installation of prepaid meters at the homes of consumers. Similarly, while the World Bank has continued to exhort its aid beneficiaries such as Nigeria to focus on enhancing transparency and providing better access to electricity through the use of CEMS inscribed in its privatisation policy, there may still be the issue of donor dependency, especially with respect to the fact that the previous privatisation programs in the Nigerian power sector have failed due to a considerable amount of high-level corruption among public officials.

The World Bank never investigated these cases; rather, the World Bank is still exerting pressure on the Nigerian government to continue with the privatisation of the electricity sector, a process complemented by the uptake of ICT interventions. This highlights the relationship of dependency between the economic interests of donor agencies and developing countries, which has been denounced in previous literature (Wade, 2004). Had the federal government failed to satisfy the conditions set by the World Bank in implementing the CEMS project, the World Bank would have withdrawn further funding of the Nigerian government. Thompson (2004) employs Foucault's conceptualisation of Bentham's panopticon (1979) to view such conditions set by powerful donor agencies as a way of using their powerful status to place *"recipients of 'development' under the 'expert' scrutiny of ICT-enabled developmental metrics to which they themselves may not have agreed: for example, the detailed monitoring of adherence to IMF structural adjustment programmes"* (pg. 104).

Thus, the FG strategy of implementing CEMS proved to be more sensitive to the wishes of the World Bank, hence allowing external agents to pinpoint the needs of the target community and proffer solutions that might restrain the beneficiaries' self-determination and to a degree reinforce or create the relationship of domination (Andrade and Urquhart, 2012). With reference to Lukes's concept of power, it could be said that this was a situation where the World Bank (a) exercised power over its beneficiaries, in this case Nigeria, and (b) used its financial powers to direct the Nigerian government to comply with its policies and to implement ICTs in order to promote the powerful donors' good governance agenda. Furthermore, such exercising of power to determine an information society when applied to developing countries thrives on the dependency theory and neocolonialism evaluated by, for instance, Adam and Myers (2003). The manner in which ICT interventions are being implemented in developing countries by powerful institutions is potentially reminiscent of colonial propaganda and the ability of empires to convince their populaces that domination is the means of salvation (Hyder, 2005). Adam and Myers' (2003) study on the implementation of IS in the Maldives' customs service argues that powerful economic, social and cultural differences were affecting the development of the system. They noted that these neocolonial and post-colonial influences included the Maldives' continued dependence on external sources of funding, and the software supplier (an agency of the

United Nations) mandating how the second version of the software should be implemented. Further, the Maldives' customs service had to change its work practices and procedures and there was even a requirement for a change in the country's law in order to harmonise their procedures with those recommended by the World Customs Organisation and the United Nations. Going back to the discussion on agency, it can be said that developing countries such as Nigeria and the Maldives are passive recipients of ICT4D interventions and are thus being deprived of their agency freedom to be active subjects in control of their own destiny. Furthermore, the initiation and design of ICT4D policies under the watchdog of these powerful donor agencies tend to be top-down in nature (Heeks, 2005; ADB, 2003), hence excluding citizens from participating and further disconnecting them from engaging in democratic practices of public policy-making.

This relates to an exercise of power mirroring Lukes's two-dimensional power of non-decision-making. According to Lukes, power is exercised in *'setting the agenda'* for decision-making, and excluding people from it. Based on the case-study analysis, it could be said that donor agencies not only exercise their power directly on the country itself, but also exercise it indirectly on the citizens, using their top-down policy approach. Indeed, this vertical approach reduced the human development benefit that the country might have gained by allowing citizens' participation, hence illustrating the disruptive relationship between ICT and civil society, in terms of disempowering the citizens (Andrade and Urquhart, 2012). This was particularly evident in the CEMS project where citizens were not only isolated from participating in the design of the CEMS project, which would have helped them make decisions that better reflect, and hence most positively affect, their values and priorities, but were also forced to accept the project in an attempt to bring about transparency in the electricity sector.

It was the supply-side actors who dominated this project design arena. Many of the citizens only heard about the CEMS project in the media and accepted it because they were led to believe by the government that the system would ultimately eradicate corruption in the electricity sector. Such isolation constitutes social exclusion (Zheng and Walsham, 2008). As Sen (2000, pg. 38) commented: *"exclusion from the process of governance and political participation is indeed an impoverishment of human lives, no matter what our per capita*

income may be". Using Lukes's analysis of power, it could be argued that power is operating here in the sense that, even after excluding the citizens from participation, the federal government (a) was able to successfully manipulate the wants of the citizens (b) by demonstrating to them that the CEMS project was the only option and in the best interest of Nigerians. As the case also illustrated, however, the lack of participation also had an implication for other agencies of citizens. For example, as a result of citizens' lack of participation, the ability of citizens to monitor the activities of supply-side actors, have access to project documentation and information, and ultimately choose which aspects of development they wanted was further curtailed. This finding supports Zheng and Walsham (2008) who argue that a lack of citizens' participation can also lead to other deprivations, thereby limiting our living opportunities. Hence, the lack of participation can be perceived as a social exclusion which is "*constitutively a part* of capability deprivation as well as *instrumentally a cause* of diverse capability failures" (Sen, 2000; pg. 5).

In the case of CEMS, where most of the information about the project was kept away from the public, it was easy for corrupt bureaucrats and top PHCN officials to involve themselves in corrupt practices such as embezzlement, choosing of contractors for the project, deciding on which constituencies would benefit from the project and so on. One could say there is a strong relationship between participation and transparency, mirroring the views of Sen (1999): *"the society operates on some basic presumption of trust. Transparency guarantees deal with the need for openness that people can expect: the freedom to deal with one another under guarantees of disclosure and lucidity"* (pg. 39). Instrumentally, even though participation was one of the top items on the agenda during privatisation policy discussions and initiation of the system, it is evident from the case-study analysis that this does not guarantee that the excluded will be heard since ICT4D users are far removed from the main decision centres of political authority (Andrade and Urquhart, 2012). In general, ICT4D interventions are driven by powerful donor agencies that have power over their beneficiaries to become the controllers and arbitrators of the type of ICT4D intervention to be provided and the methods of its production and distribution (Andrade and Urquhart, 2012).

Such domination and the exercise of *"power over"* by donor agencies have implications for agency at two levels: the international and the local level. At the international level, it deprives the country itself of the agency of choosing what kind of development it wants; secondly, the nature of implementation of these donor interventions restricts the agencies of the citizens from voicing their concerns with regard to the interventions. In sum, both the country itself and its citizens are merely passive beneficiaries of ICT4D interventions.

7.1.2. National Domination of ICT4D

As the case also illustrated, however, the pursuit of the implementation of ICT is powered by pressures not only at the international level but also at the national level where there appears to be the phenomenon of vested interest. The issue of vested interest has been identified in ICT4D literature (Sahay and Puri, 2008; Imran and Gregor, 2011). However, in the case-study analysis, this study goes further to categorise vested interest into two areas: *personal and political interest*. In the case of personal interest, the huge amount of money involved in the project contributed to a high level of vested interests among groups involved with electricity-related corruption, who thought they could exploit and abuse the complicated, bureaucratic system by awarding themselves lucrative contracts. These groups largely consist of politicians and PHCN officials spanning all levels, as well as influential private individuals, many of whom are politically very powerful. For example, contractors bribed top PHCN officials and politicians to make sure the bidding concessions for the project went in favour of their companies.

Also, it was reported in the case-study analysis that top PHCN officials, who saw CEMS as a project in which they could easily embezzle funds, bribed members of the FEC to approve the project by promising them a fair percentage of the implementation to their constituencies. Such action reflects Lukes's three-dimensional view of power. Lukes (1974) argues that *"the bias of the system is not sustained simply by series of individually chosen acts, but also, more importantly, by the socially structured and culturally patterned behaviour of groups, and practices of institutions, which may indeed be manifested by individual's inaction* (pg. 21-22). According to Lukes, power can be manifested in the form of preference-shaping where A can influence B in order to satisfy A's desire. In this case-study, this insidious form of power tends to have negative implications for individual agency. For

example, because ENL and MOMAS had already influenced the decisions of the top PHCN officials and politicians with regard to the bidding process of the project, this deprived other small local entrepreneurs of the freedom of participation in economic activities with regard to the project. It was not only personal interest that affected the drive for the initiation of the project but also political interest. Many of the politicians, especially those who were part of the FEC, hurriedly pushed for the approval of the project, with influence from top bureaucrats, in order to showcase the project as a developmental project in their constituencies, thus increasing their political popularity and chances of winning elections. The only connection between the politicians and the citizens is the formers' interest in ensuring that the project remains alive (Andrade and Urquhart, 2012).

The findings show that the culture is still biased towards making decisions on ICT4D interventions according to vested interests. The case analysis may therefore be seen to have illustrated that the initiation and implementation of CEMS was strongly influenced by the World Bank's modernisation policy and vested interest. This implies that potential users of ICT4D interventions are merely passive recipients of the potential benefits of innovation and are unable to become the authors of their own lives, thereby curtailing the individual agency. Despite protests by consumers about the power sector reform and its complementary projects such as CEMS, consumers lack the power or authority to stop the decision-makers from initiating the project. Hence, with the power of authority held by the ministers and politicians, they were able to exercise their power over the consumers by going ahead with the project without consumers' approval. Hence, the detailed findings show that, even though CEMS was designed and implemented to benefit the citizens of the country, one of the major drivers of such a project is the economic and political advantage it confers, and the major actors reaping the benefits of such a project are politicians, local bureaucrats and their allies.

In summary, development projects aimed at eradicating poverty are usually turned into rich personal resources. Usually, decisions regarding the process of design and implementation lie mainly in the hands of the donor agencies, politicians and, to a lesser extent, the public bureaucrats. Generally, demands for the benefits of participation in the initiation and design of the project come from the consumers themselves and are communicated through various

channels, the most common of which are the politicians. However, these demands are usually not met and do not necessarily represent the majority of the community. Instead, they may express the collective interest of elites or the politicians themselves. On the whole, the consumers or civil society are usually weak and have no effect on the dominance of supply-side actors in the design, initiation and implementation of CEMS.

7.2.   The Relationship between ICT and Capabilities

ICT4D interventions are expected to improve human wellbeing. In the case analysis, the study found the expected contributions of ICT to human development on four different levels: economic, good governance, political and education. The following section using the language of capability discusses these expected contributions in order to further our understanding of the relationship between ICT and human development.

7.2.1. Economic Capabilities

Firstly, the case-study reveals that CEMS has enhanced consumers' ability to gain access to bank accounts which in turn allows them access to bank loans and the ability to save their money. This is mainly because of the design of CEMS, which provides consumers with the opportunity to download their bills; these bills confirm their names and addresses which can be easily validated by the banks for authenticity when opening new bank accounts. Thus, the findings illustrate the instrumental role of ICT in alleviating poverty by providing citizens with access to the financial sector (De and Ratan, 2009). In the same vein, the case-study analysis shows mixed results with regard to citizens' freedom to generate income as a result of the introduction of CEMS. According to Heeks (2008), the generation of income in the community can play a vital role in reducing poverty and improving livelihoods. However, there is considerable evidence from the case-study findings that powerful PHCN officials blocked the bidding process with regard to the supply, implementation and maintenance of infrastructures needed for the successful operation of CEMS in order to allow them to choose their preferred contractor. On the other hand, the chosen contractor, ENL, subcontracted the jobs to smaller entrepreneurs and citizens, thus facilitating economic growth in rural communities by providing employment to citizens and offering opportunities for small-scale entrepreneurs through the supply of IT equipment and public-private partnerships (Tiwari, 2008, Madon 2004).

It was evident from the case-study analysis that local entrepreneurs were able to supply computer systems and networks, hence allowing them to generate local socio-economic activity and sustain their livelihoods. The case findings also identified the role of ICT in employment, another way of improving livelihoods that will result in the reduction of crimes committed by unemployed youths in society. The potential of ICT for this purpose has been recognised previously, especially with regard to telecenter projects which have provided opportunities through self-employment or formal employment (Bailey, 2009). Consistent with the common themes found in previous literature, the CEMS project became part of the socio-economic reality as it gave graduates and non-graduates the opportunity to enter the formal economy. The case showed that a majority of citizens were more concerned about how the CEMS project could contribute to giving them employment and to future improvements of their knowledge and employment prospects, thus showing a complementary relationship between the freedoms of economic opportunities and social opportunities (Sen, 1999). However, the case findings show that the employment opportunities were limited mainly to IT graduates, and very few graduates from other disciplines were employed.

To further investigate the relationship between CEMS and livelihood improvement through entrepreneurial activity and employment, although this was not the main purpose of CEMS, it can be noted that the success rate in gaining employment and involvement in entrepreneurial activity resulting from the CEMS project was not encouraging, as the majority of the successful individuals and entrepreneurs only managed to become involved in the project as a result of having contacts with those who were in powerful positions to influence the outcome of the recruitment and contract-awarding process. The finding suggests a vague awareness of a direct relationship between ICT and entrepreneurial activity and employment. Furthermore, while the findings may have shown that some citizens were employed and given small jobs by CEMS, it can be strongly argued that their economic agency was deprived.

7.2.2. Transparency Capabilities

Nussbaum (2003) identifies a mutual relationship between a transparent system and empowerment as an essential element of the CA and governance. The process of empowerment is supported by a transparent system, which in turn impacts on empowerment. Institutions play a key role in providing a transparent environment for which ICT can serve as an effective tool. As discussed in the literature, the role of institutions in combating corruption, financial irresponsibility and underhand dealing has been emphasised (Shihata, 2000). Even Sen (1999) himself talks about transparency guarantees, which are considered an important part of the five instrumental freedoms and are regarded as important for making processes and systems accountable. Having appropriate institutions to oversee the markets is fundamental to the instrumental freedoms related to economic facilities, as identified by Sen (1999). There is a close relationship between poverty reduction and governance, and ICT can play a key role in this domain via its link with information, which is a dominant element of transparency and accountability in governance (Bhatnagar, 2003). This was the case with CEMS, as there were a few encouraging signs of governance and transparency. For example, consumers now have the freedom to pay their bills without interference by corrupt officials, and CEMS has enhanced consumers' freedom to receive a high-quality electricity supply without feeling cheated by electricity thieves through its electricity theft control.

In spite of this, the findings of the study reveal that corruption is still able to thrive, due to the activities of corrupt PHCN personnel. Similarly, the findings of this study present a scenario in which consumers still lack the opportunity to hold PHCN accountable. Findings show that, despite the ability of CEMS to offer some form of transparency, consumers' complaints to the ATU, police and anti-corruption bodies about irregularities they have detected are never investigated, leaving the culprits to go scot-free. This finding substantiates Heeks's (1998) argument that ICTs merely serve as a reporting tool and cannot completely create accountability because they have no innate accountability properties. It seems that consumers are now better able to access electricity without having to bribe officials. This study argues that this is not completely true due to the hidden nature of bribery. For example, corrupt PHCN officials still secretly collect money from consumers before agreeing to install the prepaid system in their homes because the new system has

blocked the avenues for collecting bribes during manual connection and disconnection of electricity, which were present in the previous analogue system. The case-study findings show that many consumers refuse to pay bribes for two reasons. Firstly, some consumers felt it was morally wrong and unfair to pay bribes. Secondly, many lack the resources to pay bribes. Thus, corruption can also find its way into ICT4D projects (De, 2006). Furthermore, the impact of CEMS on nepotism and favouritism was uniquely different. The case-study findings show that there was an increase in the unfreedoms of nepotism and favouritism due to the easy access to information by PHCN officials using CEMS. Many consumers were more confined by these unfreedoms as they are assumed to be cultural practices. For example, it was normal for PHCN officials to entertain applications by family members and hasten the process in order to maintain that strong family bond. Thus, the findings supplement the literature, indicating that ICTs may have provided the opportunities for public officials to creatively continue their corrupt practices facilitated by both social and personal factors (Wescott, 2001; Heeks, 1998). Further, the findings confirm Bertot et al's (2010) conclusions on the lack of evidence to confirm the eradication of corruption using ICT. Citizens with the financial resources can secretly offer money to influence decisions by public servants on electricity matters.

7.2.3. Educational Capabilities

Finally, the analysis of this study shows the importance of knowledge and learning attached to CEMS. The study showed that many of the citizens who found employment as a result of the project gained a substantial amount of education with regard to computer applications, networking, databases and so on, which resulted in high self-esteem and confidence, hence illustrating the relationship between education and empowerment. Furthermore, some of the women employed to issue electricity vouchers using the computer valued the knowledge they had acquired as a result of using the system, thus encouraging them to enrol on short-term computer courses to further enhance their knowledge. The findings of the study mirror the capability approach view that education constitutes both instrumental and intrinsic values (Sen, 1999). The freedom that ensues from being educated can be seen as a step towards citizens being able to lead the lives they value and have reason to value. Furthermore, the findings illustrated that, as a result of the use of the prepaid meters, consumers have now learnt ways of saving energy, thus contributing to a healthy and

sustainable environment. This finding shows a positive link between health and education, hence corroborating the views of Dreze and Sen (1989) on the importance of education and how it influences an individual to convert other goods and services into human capabilities: *"through education one learns to convert, say income, to nutritional capabilities. In order to maximise these capabilities, it is necessary to be educated in basic nutrition".* (pg. 262)

7.3.   The Conversion Factors that Enable or Restrict Citizens in Terms of Transforming ICTs into Capabilities

From the study of the CEMS project, it has been discovered that the extent to which consumers can achieve their development capabilities and freedoms from the electricity administration services supported by CEMS is not completely dependent on computerisation. This empirically substantiates the arguments of Robeyns (2005) that the relationship between goods and capabilities of achieving beings and doings is influenced by what she described as conversion factors. The conversion factors in this case are personal, social, political and environmental.

7.3.1. Personal Factors

Many consumers complained that they lacked the knowledge and skills not only to use CEMS services but also to acquire information that will be essential to enhance their individual capabilities; instead they found it easier to bribe PHCN officials to perform these services in order to achieve their potential capabilities. A lack of skills and knowledge has been identified as the set of personal conversion factors hindering individuals from converting ICTs into potential capabilities (Zheng and Walsham, 2008; De, 2006). However, the case-study analysis showed that, while the citizens lack the skills and knowledge, they still found alternative ways to use the system, albeit unethically, by paying bribes to PHCN officials to achieve their capabilities.

7.3.2. Environmental Factors

The majority of consumers, especially those in the satellite and rural areas, complained that the lack of infrastructure in their areas meant that the CEMS project was being implemented more readily in urban areas, thus causing inequitable access to CEMS. This finding lends credence to the work of Pathak et al. (2007) who noted that the potential developmental benefits of ICTs may be limited in developing countries, not because of technology but due to their inability to reach the entire population as a result of

infrastructural challenges. The findings show that the CEMS project favoured those citizens living in the urban areas (Heeks, 2009), thus excluding citizens in the rural and satellite towns from the information society (Castells, 1996). Thus, poor infrastructure constitutes an environmental factor which leads to consumers being deprived of the capability to exploit information to advance their developmental goals.

7.3.3. Social Factors

Socio-cultural issues tend to affect the conversion of CEMS into potential capabilities by consumers. These points lead to social and economic considerations: over 60% of PHCN officials are temporary project workers who earn about N18000 (US$110) per month. A middle-level civil servant working at PHCN on salary grade 9 earns about N70000 (US$430) per month, which includes both basic salary and other allowances such as housing and food. As casual staff, the temporary project workers are not entitled to allowances such as pensions, medical care, and transport and housing allowances. The argument is that the majority of the staff members are not empowered by the system to resist the temptation of corruption. The findings of this study show that disempowered staff and corruption are two interrelated conversion factors that deprive consumers of transparent access to electricity services. Another issue that tends to affect the conversion of CEMS into potential capabilities is that of information-sharing by the contractors. It is widely accepted that, without the coordination and cooperation of the different actors involved, ICT4D interventions will fall short of a proper design and implementation (Karikari et al., 2003). Achieving the cooperation of actors is very difficult in the case of CEMS, where different actors are pursuing different vested interests. In the case of the contractors, ENL were unwilling to share the same vending server with MOMAS because they thought MOMAS had been encouraged by top PHCN officials to push them out of the business. In this case, both contractors had independent servers, implying that consumers with MOMAS prepaid meters could not purchase prepaid vouchers from ENL vending points and vice versa.

This finding can be referred to as institutional jealousy, as identified by Silva (2007), where actors tend to withhold information and neglect cooperation with other actors, which is a key impediment to the design, implementation and use of ICT4D systems. It is argued that this issue has to do with power struggles. It is a power issue, given that each actor does not

see any incentive for sharing information (Davenport, 1992). Moreover, it was found that top PHCN officials were reluctant to facilitate cooperation between these two contractors because the dispute led to the suspension of the project. This meant that some consumers had to go back to the use of the manual systems, which opened the door to corrupt practices by PHCN officials. Similarly, the disciplinary procedure to enforce actors' compliance with information-sharing seems to be lacking (Dandeker, 1990). Hence, the challenge for project sponsors will be to encourage cooperation among the various actors regardless of their interest and their belief that they can do without one another (Lukes, 1974). This may seem a challenging task, considering the fact that institutional jealousy, vested interests and practices of non-cooperation, as previously discussed, have been in place for decades in developing countries (Silva, 2007).

Another conversion factor is lack of awareness about the dangers posed by corruption to the wellbeing of the people. Citizens are not greatly concerned about high-level corruption but are more visibly and directly affected by the corruption at the cutting-edge level of administration which they experience daily. The Nigerian concept of *"Chua Chua",* which refers to cutting corners, is another reason for the public's tolerance of corruption. The elaborate and red tape-ridden systems leading to massive delays in action by public institutions accustom the common citizens to the belief that paying bribes as *"speed money"* is part of the system. For example, the study shows that many consumers considered paying bribes instead of going through the step-by-step process of gaining access to electricity. The study further highlights weak anti-corruption bodies as a conversion factor that results in the deprivation of citizens' capabilities. The initiatives taken by PHCN to establish a complementary anti-corruption and transparency unit in line with CEMS have largely been pushed by the World Bank and implemented mostly to deal with low-level and administrative forms of corruption. It is noteworthy that no politicians or bureaucrats have been punished for corruption crimes despite all the complaints made by consumers in regard to the usage of the system.

The fact that no political or administrative figure has been charged and investigated despite the corrupt practices that marred the previous power sector reform and the adequacy of the law to do so demonstrates that the determination to fight corruption and bear the

political risk and cost of doing so is lacking within the CEMS project. This finding corroborates studies in the literature indicating that anti-corruption bodies are weak in developing countries (Coldham, 1995) and efforts made by governments to tackle corruption are fruitless since citizens' demands that corrupt bureaucrats and politicians be investigated cannot be enforced by legal and political sanctions (Johnston, 1997).

7.3.4. Political factor

Furthermore, there is a severe lack of political will to tackle corruption at the apex levels in ICT4D policy-making in Nigeria. First of all, as seen from the case findings, the members of the FEC, politicians and top PHCN officials are protected by and thrive under the administrative authority bestowed on them. There are significant conflicts of interest at the top level of decision-making with regard to the system, which implies that the national good, which includes the restriction of corruption in the electricity sector, is undermined by other, pecuniary interests of powerful actors in Nigeria. In terms of power incentives, it seems that the powerful politicians are willing to go to any lengths to secure their hold on power. As the case indicated, the CEMS project was strongly approved because the politicians wanted to use it as a tool for winning elections. In terms of wealth incentives, the pecuniary interests of the powerful actors and private business interests are well taken care of through the politicians' hold on political power. For instance, top PHCN officials block bidding processes in order to issue contracts to their preferred companies. Also, politicians and top PHCN officials have relationships with businesses that often secure government contracts, guarantees and favours. In a policy-making environment that lacks transparency, with an emphasis on personal and private interest over national interest, it is unlikely that any political will to tackle corruption will emerge from the supply-side actors (Tran, 2010).

However, the study shows that the lack of political will resides not only in the supply-side actors but also in the demand-side actors as the case analysis indicates that some consumers are willing to bribe PHCN officials to hasten their applications while others go as far as bypassing the prepaid meters so that their electricity consumption is not recorded on the system. Thus, the lack of political will is highly related to corruption and can also be referred to as a social conversion factor that hinders the conversion of CEMS into potential capabilities. Better access to electricity requires other conversion factors such as consumers'

participation. However, the isolation of consumers and denial of access to project documentation from the initiation and design of the system deprived the citizens of the ability to voice or express their concerns, thus leading to social exclusion (Zheng and Walsham, 2008). So, the lack of consumer participation is a factor contributing to capability deprivation. Finally, the World Bank's dominant conceptualisation of corruption as the abuse of public office for private gain sees public bureaucrats and officials in developing countries as corrupt and responsible for the failure of ICTs in those countries. Hence, during ICT4D policy implementation, top-down reform paths put the agents (i.e. politicians) at the centre and focus on preventing corruption practised by sub-agents (i.e. bureaucrats) (Tran, 2010).

This study argues that this approach is inadequate during ICT4D initiation and design as it requires capable leadership which rarely exists in developing countries; also, citizens are insufficiently involved and receive inadequate resources to participate in the fight against corruption. This bias creates a bottleneck in the relationship between citizens and the government, as illustrated in this case. Furthermore, top politicians and bureaucrats are rarely interested in being transparent in the absence of pressure and monitoring by citizens (Tran, 2010). The human capability approach presented in this study advocates the correction of this bias by calling for more investment and focus on the capabilities of citizens (Sen, 1999). Two significant capabilities that have been identified as crucial in the fight against corruption but lacking in this case-study and in most developing countries are, firstly, the opportunities granted to citizens to have access to the stock of information about policy interventions and, secondly, citizens' opportunities to hold decision-makers accountable to the law for any inconsistencies reported. As Tran (2010) notes, enhancing the capabilities of the citizens means empowering them to demand and achieve a transparent and accountable government.

Furthermore, this study argues that the World Bank's conceptualisation of corruption, which focuses only on public bureaucrats as being corrupt, is an incomplete view of corruption and supports the claim of Sahay and Puri (2008) that what gives corruption a voice is the *"network of corruption"* that takes shape, and its structural and process characteristics. Furthermore, this study goes on to show that the network of corruption is present at three

levels of ICT4D projects: the design, implementation and usage stages. Viewed from this perspective, the findings of this study show that international donor agencies are equally to blame as the top PHCN officials for promoting corrupt practices. For example, the analysis section shows that, despite the corrupt practices that have engulfed previous privatisation programs, the World Bank has remained silent on the matter and has continued to encourage such policies. Further, these networks include, in this case, technology vendors, banks and top bureaucrats who often find patronage through ministers and politicians in charge of decision-making at the apex level.
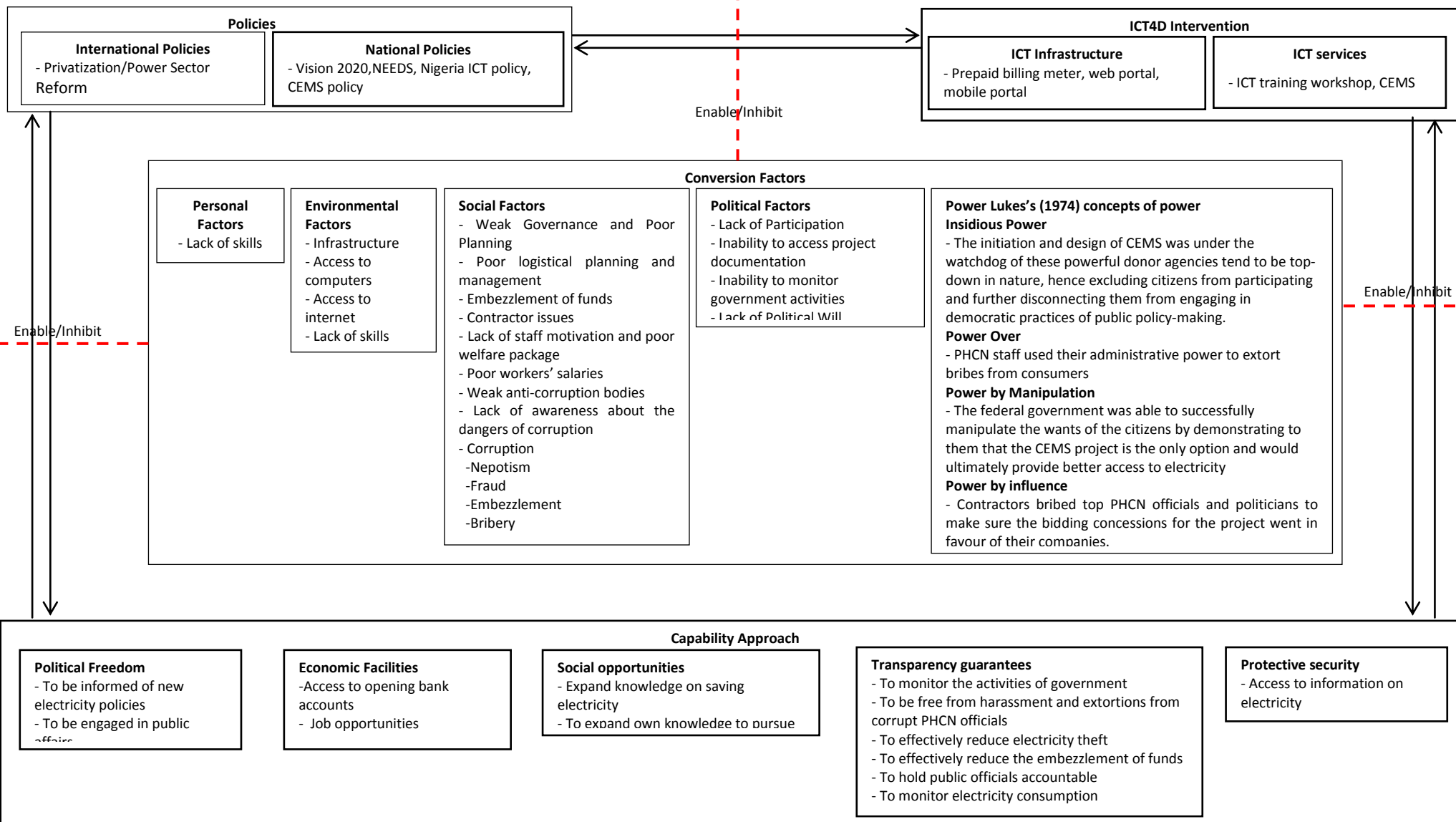
Agent	Commodities	Potential Capabilities	Conversion Factors	Lukes's concept of Power
Consumers	**CEMS Resources** • Policy Making Discussion Forum • Web-portal • Mobile portal • Prepaid Billing System	**Economic** • Access to opening bank accounts • Job opportunities **Accountability and Transparency** • To monitor the activities of government • To be free from harassment and extortions from corrupt PHCN officials • To effectively reduce electricity theft • To effectively reduce the embezzlement of funds • To hold public officials accountable • To monitor electricity consumption **Political Liberties** • To be informed of new electricity policies • To be engaged in public affairs **Educational Capabilities** • Expand knowledge on saving electricity • To expand own knowledge to pursue own interest	**Personal Factors** Lack of skills **Environmental Factors** Infrastructure • Access to computers • Access to internet • Lack of skills • Low broadband **Social Factors** Weak Governance and Poor Planning • Poor logistical planning and management • Embezzlement of funds • Contractor issues Lack of staff motivation and poor welfare package • Poor workers' salaries Weak anti-corruption bodies Lack of awareness about the dangers of corruption Corruption • Nepotism • Fraud • Embezzlement • Bribery **Political Factors** Lack of Participation • Inability to access project documentation • Inability to monitor government activities Lack of Political Will	**Insidious Power** The initiation and design of ICT4D policies under the watchdog of these powerful donor agencies tend to be top-down in nature, hence excluding citizens from participating and further disconnecting them from engaging in democratic practices of public policy-making. **Power Over** The World Bank, top government and PHCN officials used their administrative power to determine the needs of the citizens by implementing the CEMS system Powerful politicians and top PHCN officials used their political and administrative positions to influence the outcome of the recruitment and contract-awarding process PHCN staff used their administrative power to extort bribes from consumers **Power by Manipulation** The federal government (a) was able to successfully manipulate the wants of the citizens (b) by demonstrating to them that the CEMS project is the only option and would ultimately provide better access to electricity **Power by influence** Contractors bribed top PHCN officials and politicians to make sure the bidding concessions for the project went in favour of their companies.

Table 7 – 1 Summary of the Discussion

7.4. A Proposed Conceptual Framework

The analysis and discussion presented above identifies the complex linkage between ICTs and development. In this context, ICT is an enabling technology deployed to deliver human centered development such as the enhancement of transparency. Using the phenomenological analysis of the introduction of an ICT4D intervention in Nigeria, the author proposes an analytical framework (see Figure 7-1) that describes the way in which power relationships influences the process of implementing ICT4D intervention and its subsequent impact on individual capabilities. By developing the framework, the author generalises from empirical statements (as inputs to generalizing) to theoretical statements (as outputs of generalizing) (Lee and Baskerville, 2003; Qureshi et al., 2009). The proposed framework uses the complementary strength of Lukes's (1974) dimensions of power together with the capability approach in order to address the capability approach's inability to analyse the role of social power in perpetuating or causing inequalities in the individual's freedom to achieve. In general terms, the framework draws upon theory from development and organisation studies, which has been identified by Heeks (2006) as disciplinary foundations of ICT4D. It also contributes to the assessment of motivations for adoption and social consequences of ICT in modern life.

According to Bass et al. (2013), there exists a gap in relation to the social context that enables people to take full advantage of ICT resources in improving their lives. Hence, the utility of this framework has been illustrated by drawing on an empirical case study of the implementation of the Computerised Electricity Management System in Nigeria. The diagrammatic form of the conceptual framework uses arrows to show the relationships between policy making process, ICTs and capabilities. The dashed line in the framework shows the influence of context (conversion factors) on the relationship between the elements of the framework. It should be noted that these relationships are not simple-cause-effects relationships but rather inter-relationships that are influenced by wide range of contextual factors. In the next section, the author demonstrates the relationships between the elements of the framework's using examples from the analysis presented earlier.

Policies

International Policies
- Privatization/Power Sector Reform

National Policies
- Vision 2020,NEEDS, Nigeria ICT policy, CEMS policy

Enable/Inhibit

ICT4D Intervention

ICT Infrastructure
- Prepaid billing meter, web portal, mobile portal

ICT services
- ICT training workshop, CEMS

Conversion Factors

Personal Factors
- Lack of skills

Environmental Factors
- Infrastructure
- Access to computers
- Access to internet
- Lack of skills

Social Factors
- Weak Governance and Poor Planning
- Poor logistical planning and management
- Embezzlement of funds
- Contractor issues
- Lack of staff motivation and poor welfare package
- Poor workers' salaries
- Weak anti-corruption bodies
- Lack of awareness about the dangers of corruption
- Corruption
 -Nepotism
 -Fraud
 -Embezzlement
 -Bribery

Political Factors
- Lack of Participation
- Inability to access project documentation
- Inability to monitor government activities
- Lack of Political Will

Power Lukes's (1974) concepts of power
Insidious Power
- The initiation and design of CEMS was under the watchdog of these powerful donor agencies tend to be top-down in nature, hence excluding citizens from participating and further disconnecting them from engaging in democratic practices of public policy-making.
Power Over
- PHCN staff used their administrative power to extort bribes from consumers
Power by Manipulation
- The federal government was able to successfully manipulate the wants of the citizens by demonstrating to them that the CEMS project is the only option and would ultimately provide better access to electricity
Power by influence
- Contractors bribed top PHCN officials and politicians to make sure the bidding concessions for the project went in favour of their companies.

Enable/Inhibit

Enable/Inhibit

Capability Approach

Political Freedom
- To be informed of new electricity policies
- To be engaged in public affairs

Economic Facilities
-Access to opening bank accounts
- Job opportunities

Social opportunities
- Expand knowledge on saving electricity
- To expand own knowledge to pursue

Transparency guarantees
- To monitor the activities of government
- To be free from harassment and extortions from corrupt PHCN officials
- To effectively reduce electricity theft
- To effectively reduce the embezzlement of funds
- To hold public officials accountable
- To monitor electricity consumption

Protective security
- Access to information on electricity

7.4.1. Policies and ICT4D intervention

The relationship between policies and ICT4D is shown in the figure above. The introduction of policies can lead to the deployment of ICT4D interventions. For example, the privatisation reform *(international policy)* of the power sector in Nigeria resulted in the initiation of the CEMS project *(ICT4D intervention)*. Also, the introductions of ICT4D can lead to the formulation of new policies. For example, the case analysis showed the introduction of CEMS *(ICT4D intervention)* resulted in the formulation of CEMS policies *(National Policy)* which contains all the information that guides the design and implementation of CEMS. However, conversion factors tend to influence the relationship between policies and ICT4D interventions. For example, the case study analysis showed that the availability of funding of $300 million for the power sector reform supported the full implementation of CEMS across the country.

7.4.2. Capabilities and ICT4D

ICTs can increase access to opportunities which can enable the aspiration leading to individuals with enhanced capabilities. For example, the introduction of CEMS *(ICT4D intervention)* provided opportunities such as job opportunities *(Capabilities)* where citizens were hired to support the implementation of CEMS across the country. Furthermore, practical skills acquisitions *(Capabilities)* through the formal learning and usage of CEMS encouraged citizens who were also staff of PHCN to enrol for short term computer courses in vocational computer schools *(ICT4D intervention)*. On the other hand, the issue of power play *(conversion factor)* can undermine the conversion of the CEMS project into capabilities such as job employment. For example, using Lukes's (1974) concept of *"power over"*, the case analysis showed that powerful bureaucrats used their power of authority to secure jobs for friends and relations. Nepotism can be seen as a conversion factor that excludes individuals from opportunities to enhance capabilities.

7.4.3. Capabilities and Policy Making

The relationship between capabilities and policy making is shown in the diagram above. A democratic policy making process can increase access to opportunities such as transparency by providing information to project beneficiaries about the goal and scope of the project formulation and on the other hand allowing project beneficiaries to voice their opinions and effect changes to project policies. Improved participation and information access helps

ensure that officials are held accountable for their actions, hence leading to reduced corruption. However, conversion factors tend to influence the relationship between policy making and capabilities. For example, using Lukes's (1974) concept of *"insidious power"*, the case analysis showed that powerful politicians and top PHCN officials used their power of authority to side-line project beneficiaries from participating during the project design and formulation for private interest *i.e. the ability to decide which areas should be covered during project implementation, deciding which contractors should be chosen to support the implementation of the project etc.*

The diagram above contributes a novel analytical framework that draws upon the Lukes's (1974) three dimensions of power together with the capability approach in ICT4D projects. Its offers the first attempt to link the notion of power and the capability approach in the context of ICT4D. The novel approach taken uses the Luke's (1974) concepts of power to illustrate how social power can impede or enable individuals from taking the full advantage of ICTS from the process of its initiation, implementation and usage. The CEMS case study (summarised in Figure 7-1) shows the complex, multifaceted nature of ICT4D problem and how power relationships influence the conversion of ICT resources into capabilities. Using our anlysis from the case study, the proposed analytical framework has alowed us to explore the complex relationship between policy making process and ICT4D on the one hand, and also among the conversion factors and capabilities on the other. However, a practical limitation of the framework is the requirement to understand both the theory of power and the capabilities approach, each of wich has its own subtantial body of literature.

CHAPTER 8 - CONCLUSION

"A conclusion is the place where you get tired of thinking."

-Arthur Bloch

8. Introduction

The purpose of this research was to understand why ICT4D interventions are being initiated and subsequently whether and how these interventions are expected to contribute to development. Its motivation was to make sense of how it is possible for ICT4D interventions to be imposed and implemented for citizens to use. The study argues that the initiation and implementation of ICT4D can be better understood from a human development perspective. In doing so, the capability approach was adapted to the domain of ICT4D. This closing chapter summarises in the first section the contributions, both theoretical and practical, to the field of ICT4D. In the second section, the limitations of both the research methodology and framework are discussed. The final section summarises the areas for future research.

8.1. Contributions

This section focuses on the contributions of the thesis. The contributions are classified into two areas: theoretical and practical.

8.1.1. Theoretical Contributions

The theoretical contributions of this thesis can be divided into two categories. One is the operationalisation of Sen's capability approach and the other is the body of knowledge on ICT4D research. Despite the existence of a wide range of studies of ICT for development, the use of the capability approach as a theoretical lens to analyse the relationship between ICT and development is still in its infancy. The interpretation of Sen's capability approach in this study may also been seen as a theoretical contribution to the ICT4D field as it can be used to further the understanding of the relationship between ICT and development. Also, by emphasising personal, social and environmental factors, the framework makes a link between the context and processes of development. Further, despite the existence of a few studies that have applied the capability approach in the ICT4D domain as discussed in chapter three, these studies have rarely touched on the issue of power, with a few exceptions. This study progresses the operationalisation of the CA by encapsulating the central aspect of the approach and Lukes's (1974) concept of power in order to show how

the exercise of power impacts on individual capabilities. This is an innovative way of operationalising the capability approach by addressing its limitation in explaining the notion of power, thereby contributing to the field of IS using the capability approach and expanding the scope of theoretical analysis of contemporary ICT4D studies.

Although some researchers have focused on the contributions of ICT to human development in the developing-countries context (Madon, 2004; De, 2006; Zheng and Walsham, 2008), very little research has been conducted on ICT4D interventions in the context of sub-Saharan Africa (Mbarika et al., 2005; Thompson & Walsham, 2010) with a few exceptions (see Dasuki, Abbott and Kashefi, 2012; Maiye and McGrath, 2010). However, none of this research focusing on ICT4D in Africa has discussed the political and power factors that boost or impede the contribution of ICT to human development. For example, Dasuki, Abbott and Kashefi (2012) only looked at the impact of ICTs on development using Sen's five human freedoms. Although Maiye and McGrath (2010) assess the institutional arrangements put in place by ICT4D project sponsors to enable citizens to participate in developmental activities, they do not explicitly discuss the power relations among the institutional actors of the project under study and how they affected the opportunities of individuals to expand their freedoms. Thus, the findings of this study allowed us to enrich our understanding of the politics of ICT4D projects in sub-Saharan Africa and their influence on individual opportunities and freedom. Further, the study has also contributed to producing empirical knowledge surrounding the development impacts of a particular ICT project in Nigeria. This substantive contribution has filled gaps identified in chapter 2, namely the lack of focus on the development perspective of ICT4D interventions in Africa.

The level of analysis addressed in this study is also different from previous studies. The analysis of the study showed the importance of institutional actors and their political manoeuvres. That is why drawing upon Lukes's (1974) concept of power together with the capability approach framework helps explain why the beneficiaries of ICT4D interventions are being deprived of the freedom to participate in the policy-making process. This was illustrated by this study's examination of the initiation and implementation of CEMS. The study of this ICT4D project demonstrates that, when those in charge of the decision-making process hold powerful positions and have personal goals, the essential aspects of the

intervention are not in the interests of the demand-side actors but rather in the interests of the supply-side actors. Moreover, if the citizens lack the power or authority to influence the decision-making process, the system may be implemented without their endorsement, albeit forcibly. This may occur when the ICT4D intervention, as in the case with CEMS, is posited as a mandatory commodity for the acquisition of potential capabilities. In other words, an ICT4D intervention may become an obligatory commodity when it has to be converted to enhance individual capabilities. Therefore, this study goes some way to addressing Andrade and Urquhart's (2012) call for researchers to more critically examine the structure and intention of ICT4D projects. In the theoretical framework chapter, it was stated that the capability approach is an evaluative framework; thus it makes sense not only of the contribution of ICTs to development but also of their non-contribution. It accounted for the contribution and non-contribution of CEMS to human development. For example, the CEMS project contributed by providing some form of employment to the citizens; on the other hand, the study showed that there was an increase in nepotism as a result of the new project in that the majority of those employed had powerful connections to politicians and top PHCN bureaucrats who helped them by influencing the recruitment process.

In this sense, the study showed how the concepts of the framework, which are conversion factors, can be applied to identify and to understand the power factors that prevent citizens from achieving the development potentials inscribed in ICT4D interventions. As such, this study generates new knowledge and insights into the relationship between ICT and development using the capability approach, thereby improving the understanding of whether and how a particular ICT4D intervention can contribute to the ability of people to lead lives they value and have reason to value. In so doing, the work points out a possible dynamic and multidimensional study that could address Souter et al's (2005) concern about the lack of empirical evidence from detailed field research on the ways poorer communities can exploit the potentials of ICTs. The study also shows that the direct link between ICT and development is missing. The notion of development is problematic, as shown and discussed in the literature review section. Therefore, the study adopted a human development perspective as an approach to national development, thus contributing to Walsham et al. (2007) and Sein and Haridranath's (2004) call for researchers to be specific about the particular aspect of development being studied. It also goes some way to addressing

Avgerou's (2010) call for research to address the link between ICT and the socio-political context, thereby contributing to a better understanding of how ICTs can improve the livelihoods of poor and marginalised communities. The study has also contributed by showing how corruption plays a role at the different stages (design, implementation and usage) of ICT4D and its implication for the individual's opportunities. At the design stage, the study has examined how corrupt practices take place between public and public actors and also between public and private actors, thus depriving citizens of the opportunity to participate in the policy design of the new system. At the implementation and usage stages, the study has also shown how corrupt practices emerge from the interactions between public and public actors and between public actors and consumers, thus depriving consumers of opportunities to gain better access to electricity.

The study illustrates that each stage of an ICT4D process has corrupt practices emerging from the interactions between multiple actors from both the demand and supply sides, with implications for the lives of individuals and society in general. This substantial contribution answers Sahay and Puri's (2008) call for a more explicit consideration of corruption by researchers interested in building a richer contextual understanding of ICT project implementation in developing countries. Further, this addresses Walsham et al's (2007) call for researchers to examine the influence of, and interactions among, a wide range of institutional actors.

8.1.2. Practical Contribution

The capability approach also has implications for understanding the contributions of ICT to development, with an emphasis on the demand-side stakeholders (De, 2006; Madon, 2004). Such an approach can feed into a policy-setting process by facilitating the formulation of appropriate indicators for evaluation, thus improving policy interventions by keeping away from mistaken priorities. From both the CEMS field study and research conducted by other ICT4D researchers, it emerged that ICT4D initiatives are relevant for developing countries, thus deserving a significant role in development strategies. However, to contribute to development, it is necessary for government policies to move beyond the mere provision of technology to also concentrate on the cultural, institution, social and political aspects in ensuring the effective use of ICT resources, which should serve to improve people's

opportunity to better participate in social, political and economic activities. Further, it is significant to continuously engage in understanding the contribution of ICTs to development, in that experiences from other projects can be of great benefit to new and existing projects in terms of avoiding pitfalls, and they can also enhance cross-project learning. The capability approach as a framework generates information and knowledge that will contribute to policy-making via its effectiveness in providing an understanding of how ICTs contribute to the lives of the people, identifying related issues and devising mechanisms to overcome them. For example, analysing good governance allows us to evaluate the existing means of accountability and transparency in ICT4D projects, and how they are challenged by existing social structures. In that regard, this study contributes to the field of studies that stress the need to evaluate ICT initiatives from a development perspective (De, 2006, Madon, 2004).

Also, the ability of the capability approach framework to enable the gathering and merging of unstructured data through its focus on key concepts (institutions, conversion factors and capabilities) and their interrelationships makes it suitable for practical purposes. Such systematic generation of knowledge, focusing on impacts, outcomes, contribution and context, has not adequately informed debates on ICT policies. More knowledge about the relationship between ICT and capabilities can facilitate the efforts to expand and broaden the developmental benefits of ICT initiatives by moving beyond those who possess the capabilities and resources to reap the benefits of these technologies to the marginalised poor. Further insights into how ICT affects people's experiences in their daily lives can produce significant inputs in the formulation of adequate development strategies and policies. The capabilities approach framework can also be of significance benefit in studying unintended ICT4D, such as the general use of mobile phones.

8.2. Implications of the Research Approach

The main contribution of this thesis is its adaptation of the capability approach framework to study the relationship between ICTs and development. The study showed how it can shed light on the contextual conditions that enable or restrict citizens in taking full advantage of ICT resources for the furtherance of their own lives. The purpose of the case-study was to

show how the initiation and implementation of ICT4D interventions can be understood from a human development perspective. The thesis has also already provided a discussion on the implications of the study by selecting an interpretive approach and an in-depth case-study as a research technique, although the study cannot claim to generalise its findings to all recipients of ICT4D interventions. However, the findings of the study may be relevant to the study of ICT4D in developing countries. As presented in Chapter 4 (section 4.4.1), following the principles of Walsham (1995) for generalisation from interpretive case-studies, this research can claim to offer generalisation to theory, as it has proposed a theoretical framework that can guide future studies in the same area. Usually, question of what form of generalizing is achievable in interpretive research, is sometimes raised. Baskerville & Lee (1999) have addressed this question at length. They discuss four types of generalizing in IS research: (1) typification; (2) learning; (3) generalizability; and (4) falsification. Typification and generalizability are forms of inductive generalizing; these are reasoning processes that begin with observations or descriptions and their subsequent use to build theories. According to Lee and Baskerville, researchers can follow the conceptions of generalisability by Walsham (1995) by generalizing from empirical statements (as inputs to generalizing) to theoretical statements (as outputs of generalizing) (See Qureshi et al., 2009).

More specifically and similar to Qureshi et al. (2009), this study contributes a novel analytical framework that draws upon the Lukes's (1974) three dimensions of power together with the capability approach in ICT4D projects. Its offers the first attempt to link the notion of power and the capability approach in the context of ICT4D. The novel approach taken uses the Luke's (1974) concepts of power to illustrate how social power can impede or enable individuals from taking the full advantage of ICTS from the process of its initiation, implementation and usage. The CEMS case study (summarised in Figure 7-1) shows the complex, multifaceted nature of ICT4D problem and how power relationships influence the conversion of ICT resources into capabilities. Using our anlysis from the case study, the proposed analytical framework has allowed the author to explore the complex relationship between policy making process and ICT4D on the one hand, and also among the conversion factors and capabilities on the other. However, a practical limitation of the framework is the requirement to understand both the theory of power and the capabilities approach, each of wich has its own subtantial body of literature. Interpretive research

usually invites criticism of researcher bias. In this study, this argument was countered by using various sources of data.

8.3.   Adequacy of the Research Framework

The study might have been based on other theoretical frameworks but Sen's (1999) capability approach framework was chosen because of its thorough analysis and insightful critique of previous frameworks of development. In addition, the capability approach framework provides an integrated and detailed view of development that other frameworks lack. However, the challenge of applying Sen's framework is that he does not discuss how to apply the framework in evaluating development policies. Besides the lack of indication of how to link data and theory, as pointed out by Zheng and Stahl (2011), the study found three main issues in operationalising the framework, also identified by previous researchers, that could generate genuine criticism as discussed in chapter three: (1) its emphasis on the institutional dimensions of ICT4D interventions and its disregard of the decision-making process; (2) its emphasis on contextual factors rather than on processes; (3) its lack of emphasis on the conflicting nature of different strategies and aspiration of wellbeing and power relations. Regarding the first and second issues, one could answer that the emphasis on institutional dimensions of policy and contextual factors is precisely why the capability approach was used as a framework in this study. Although the study acknowledges that the capability approach is far from decision-making theories and rational choice, it is believed that the decisions made by agents are influenced by their institutional environment; that is what has been focused on in the case-study. Moreover, its emphasis on contextual factors makes the capability approach a useful instrument for linking process and context.

As discussed earlier, Zheng and Stahl (2011) discussed Sen's silence with regard to power relations in the capability approach. They suggest that, to overcome this limitation, the capability approach should be applied along with other theories such as critical theory. In this study, Lukes's (1974) concept of power was drawn upon in the context of the capability approach in order to make more sense of the political context and power relations. In the case of CEMS, by linking the power and political elements that contributed to the initiation and implementation of the project, the study pointed out the interests and manoeuvers of supply-side stakeholders, as well as the complete isolation of the intended beneficiaries of

the project, which deprived them of the freedom of being agents of their own lives. Hence, the author believes that, by drawing upon Lukes's concept of power in the capability approach, the former gains a political perspective while the latter obtains a strong descriptive tool that involves explaining the relationship between ICT and human development. The study also acknowledges the limitation of the capability approach in accounting for the agent's decision-making process. There is not much that can be done about this since the focus of the study is on the relationship between ICTs and development. It is believed, however, that focusing on the personal, social and environmental factors is a step towards understanding the processes of decision-making.

8.4.   Areas for Further Research

The capability approach was applied to understand the contribution of ICTs to development. The author believes that the field of ICT4D would benefit were more research to be conducted on how the framework might be applied to the areas such as methodologies for design of ICT4D interventions. This could be done on two levels. One is by assessing how current methodologies can account for empowerment of the marginalised poor. In this way, policy designers might understand how ICT4D interventions can be enhanced, particularly when those methodologies overlook the human development aspects such as participation and empowerment of ICT4D. The other level would be to research how elements of the capability approach can be adapted to become part of the techniques of the methodologies, especially for analysing the human development elements of ICT4D. To enhance existing methodologies for ICT4D interventions, the capability approach would need to improve its data techniques and presentation. The author acknowledges that this study has attempted to operationalise the capability approach using CEMS as a case-study; however this case-study cannot indicate how to use the concepts of the framework in evaluating ICT4D interventions. Hence, an interesting area of research would be to apply and further develop the framework in case-studies where the main topic is the evaluation and design of ICT4D interventions. The development of data representation techniques for the capability approach would help policy-makers to analyse the contextual factors that affect and are affected by ICT4D interventions. Once representation techniques have been devised, they can be integrated into ICT4D methodologies.

Increasingly, organisations in developed countries are opting not to develop their information systems in-house but to outsource those services to organisations in developing countries. The author believes that an interesting area of further research would be to apply the capability approach to study the relationship between outsourcing and human development. This research could be valuable to managers of organisations outsourcing these services. Applying the framework to outsourcing could help managers of these organisations to move beyond mere cost reduction and profit maximisation to understanding how such outsourced services can play a role in improving the livelihoods of the community through entrepreneurship. For example, to what extent might the increase in IT outsourcing result in more employment and increased economic activity in poorer communities? Further studies in the field of ICT4D should seek to build on the work of Madon (2004), evaluating the contribution of ICTs using the capability approach. While existing studies have not yet conclusively demonstrated that ICT4D projects have improved people's capabilities, functionings and freedoms, there is a need to identify context-specific approaches to how this might be achieved. Although this study may have made modest gains towards this end, arguably significant work still remains to be done if we want ICT4D applications to deliver their potential. Also, the study recommends further research of a longitudinal and historical nature investigating post-colonial and neocolonial influences of ICT4D in other developing countries.

This study concludes that the proposed framework drawn upon from Sen's (1999) capability approach and Lukes's (1974) concept of power can be used to understand the relationship between ICT and development. The study does not claim that the framework is the only framework that can be used to achieve this; nor does it wish all phenomena to be understood as human development issues. But the study has certainly shown that, by emphasising individuals' aspirations to wellbeing, it was able to describe the contextual conditions that enable or constrain individuals in transforming ICT4D interventions into valued activities that could improve their livelihoods. The author also believes that the there are opportunities to expand on this study through further empirical research to enable a more detailed taxonomy of the various elements of the framework that can be present in an ICT4D intervention. The framework needs to be further developed, especially methodologically in the representation of data techniques, if it is to be used as an

instrumental tool for designing ICT4D interventions. Other areas of future work would be for research to compare the framework with other established development frameworks such as the sustainable livelihood framework (Carney, 2002; Scoones, 1998).Finally, the author hopes that this work will be an important contribution to understanding the relationship between ICTs and development.

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APPENDIX

Approval for Empirical access

PHCN — Power Holding Company of Nigeria
Power Holding Company Of Nigeria Plc

Telephone: +234 – 073 - 456168
           +234 – 073 - 454088

Bukuru Business Unit,
Express Way,
Jos South – Plateau State

Ref: PHCN/295/BM/BK/002/ *193* /2010

Date: 25th June, 2010

Salihu Ibrahim-Dasuki
St John's Building,
Brunel University,
London,
United Kingdom.
UB8 3PH

Dear Salihu,

RE: REQUEST FOR ACCESS TO CONDUCT EMPIRICAL WORK

Your mail on the above subject refers.

We would like to thank you for your interest in conducting your empirical study around the Nigeria Electricity Prepaid Billing Meter and using PHCN as a case study.

Please be informed that the management of the commission has **Approved** your request and look forward to working with you. We hope the outcome of your PhD thesis would be beneficial to us all.

We wish you all the best in your academic endeavours; please accept the company's highest assurance.

On receipt of this letter you should report to the Business Manager, Bukuru Business office, Jos.

Please note that the management of PHCN does not in any way have financial dealings with students on Research projects.

Thanks.

Yours Faithfully,

Engr. Dalahol, P.D
Business Manager
Bukuru Business Unit,
Jos South.

Participant Information Sheet
Power Holding Company of Nigeria

Study: Investigating the Contributions of Information and Communication Technologies for Development (ICT4D) Interventions to Development using the Capability Approach: A Case Study of the Computerised Electricity Management System in Nigeria
Investigator: Salihu Ibrahim Dasuki
Email: salihu.ibrahim-dasuki@brunel.ac.uk

Introduction

This is an invitation to participate in a research study. Please read this information sheet to better understand the research purpose and what it entails. Please note that participation is voluntary and your consent should be given freely of your own accord. Also, even with prior consent given, you may withdraw at any stage without being required to provide any reason for doing so.

Information about the proposed study is provided below. Please do not hesitate to contact the above-named investigator for further discussion on any unclear issues

Purpose of the Study

Information and Communication Technologies have been introduced in the public sector in a bid to provide a better citizen service and operations. This research seeks to examine the impact of the computerised electricity management system on development issues. This research is being carried out in partial fulfilment of the requirements of the award of a PhD (Doctor of Philosophy) in Information Systems Management from Brunel University.

Participant Selection

A prerequisite of the selection of participants was stakeholder identification. This study requires the participation of people who have vested interests in the system. These include the business manager, the distribution manager, marketing manager, metering specialist and indigenous meter suppliers.

Voluntary Participation

Noting the earlier statement on voluntary participation, consent is indicated by signing a consent form. This, however, does not compel you in any way to continue to participate should you decide to change your mind at any time.

Benefits of Participating in the Study

The value of participating in this study cannot be explicitly expressed for each individual's case but it will provide an avenue to express your opinions. This may thus lead to identification of issues that provide rich insights and contribute significantly to development of further information systems in developing countries.

Risks

There are no apparent risks in participating in the study. The interviews will not take longer than one hour and will involve the investigator taking notes of things relevant to the study and may also be audio-taped. However, the interview will only be audio-taped with your prior consent. Also, a copy of the notes taken during the interview can be made available to you on request.

Complaints

If you have any problems or reservations about the conduct of your interview and do not wish to take up issues with the investigator, you may contact Dr Pamela Abbott who is supervising this research by email at Pamela.abbott@brunel.ac.uk

Confidentiality

Assurance of confidentiality of all that transpires during interviews is given by the investigator. This also applies to all respondents of questionnaires as they are not required to furnish names so that all information is anonymous. Also all the data gathered during the study will be used only for academic purposes including writing a thesis as required for the award of a PhD.

Post-Research Findings

On completion of the study, the report will also be made available to the participants; however, we will ensure that anonymity is preserved and that no individual comments are attributable.

If you have any concerns or complaints regarding the ethical aspects of this project please contact siscm.srec@brunel.ac.uk or Dr Laurence Brooks, Tel. No. 01895 266010

School of Information Systems, Computing and Mathematics
David Gilbert, Head of School, Professor of Computing
Jasna Kuljis, Head of Information Systems and Computing, Professor of Computing
Tony Rawlins, Head of Mathematical Sciences, Professor of Applied Mathematics

Brunel
UNIVERSITY
WEST LONDON

The Management,
Power Holding Company of Nigeria,
Plot 441 Zambezi Crescent,
Abuja,
Nigeria.

Brunel University, Uxbridge,
Middlesex, UB8 3PH, UK
Telephone +44 (0)1895 274000
Fax +44 (0)1895 251686
www.brunel.ac.uk/siscm

Dear Sir/Madam,

RE: REQUEST FOR ACCESS TO CONDUCT EMPIRICAL WORK

I am currently a PhD student under the supervision of Dr. Pamela Abbott in the School of Information
Systems and Mathematics at Brunel University West London, United Kingdom. I am conducting
research into the evaluation of the Nigeria Prepaid Electricity Billing Meter. The aim of this study is
to examine the impact of the prepaid billing meter on development issues. The answers given are very
important for the accuracy of this study. It will allow us and others in the power industry to further
understand the impact electricity billing system on development.

Your organisation (The Power Holding Corporation of Nigeria) has been selected. In order to progress
with this study, I will like to conduct interviews with some members of your organisation. They are
the Business manager, the distribution manager, marketing manager and metering specialist. Both
your personal and company details will remain anonymous and protected under the United Kingdom
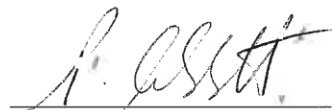Data Act of 1998.

If you are interested in receiving a report on the finding of this study, please just add your name and
email at the end of the attached consent form and return it to the project director, or if you prefer,
request the result of the study in a separate email. We will be glad to send you a copy when ready.

Thank you

Salihu Ibrahim Dasuki
PhD candidate/ Project Director
Department of Information System
& Computing
St. John's Building
Brunel University

Tel: +447554429445
Email: salihu.ibrahim-dasuki@brunel.ac.uk

Dr Pamela Abbott
Project Supervisor
Department of Information Systems
& Computing
St. John's Building
Brunel University

Tel: +44(0)1895 267334
Email: pamela.abbott@brunel.ac.uk

Consent Form
Power Holding Corporation of Nigeria

Title of study: Investigating the Contributions of Information and Communication Technologies for Development (ICT4D) Interventions to Development using the Capability Approach: A Case Study of the Computerised Electricity Management System in Nigeria

Name of Researcher: Salihu Ibrahim Dasuki

I confirm that I have read the researcher participant information sheet.   ☐

I have had an opportunity to ask questions and discuss this study.   ☐

I have been provided satisfactory answers to any query I asked.   ☐

I am aware that my participation is voluntarily and I can withdraw   ☐

anytime I so desire without giving reason.

I understand that this research is part of a thesis for a PhD program   ☐

 and therefore any information I provide can be disclosed to concerned

academic supervisors for review purposes

Tick all applicable

I agree to be interviewed   ☐

Be taped during interview   ☐

Provide response for a questionnaire   ☐

Name of Research Participant_____

Signature_____

Date_____

Interviews

Interview Protocol: Consumers
- Tell me about yourself?

- What is your education level?

- What is your occupation?

- Have you heard about the privatisation reform in the electricity sector? If yes, tell me what you know about it?

- Has your political representative briefed you about why the government is carrying out this reform?

- Do you think there will be improvements in the electricity sector as a result of the privatisation? If yes/no explain why?

- Have you heard about the Computerised electricity management system (CEMS) that is part of the privatisation reform? If yes, how did you hear about it?

- What are your thoughts on the privatisation reform and CEMS project in general?

- Do you think the CEMS project can reduce corruption and enhance better service delivery in accessing electricity? If Yes/No, explain?

- Do you think the introduction of CEMS can also contribute to improving your life and the life of others in the community? If so, how?

- If No, explain what other factors can contribute in achieving this developmental goal?

- Whether or not CEMS would be useful if implemented, can you suggest any changes that would make it more useful to you and other members of the community?

- Can you briefly discuss your participation in the CEMS project?

Use and views about CEMS

- Do you use CEMS services?

- If yes, how long have you been using it?

- What facilities of CEMS do you use?

- What do you use CEMS facilities and services for and why?

- Which of the facilities and services do you find the most useful and why?

- Can you briefly explain what kind of support you received from PHCN in terms of how to use the facilities and services provided as a result of CEMS?

- Can you describe the issues you encounter while using these facilities and services and how you have dealt with these issues?

- How would you compare the computerised system and the analogue meter, and which of them favours you the most?

- Briefly describe to me other ways that CEMS has affected you, your household or any other activities?

- In the past, consumers complained about high rates of disconnection, over-estimated billings, bribery and corruption by PHCN officials. But with the prepaid meter, consumers pay for only what they consume. Briefly explain whether the prepaid meter has tackled these issues and how this has increased the trust between you and PHCN?

- How has been your interaction with PHCN officials since the introduction of the new system?

- How relevant is CEMS for your day-to-day activities?

- Is there anything you were hoping to use the CEMS facilities or services for, but have not been able to? If so, what would you like to do and for what reason?

- Are you satisfied with what CEMS offers?

- If you have encountered any problems, have these affected your interest in using CEMS? How?

- Do you pay anything for requesting or using CEMS services? If yes, what do you pay for?

- If you are not using the CEMS services, why not?

- Can you suggest anything that would improve the CEMS facilities to better meet your aspirations and those of community members?

Participants' perceptions of the expected contributions of CEMS

- Can you describe how the CEMS project has affected your way of living, both positively and negatively?

- What is the most significant change you have noticed as a result of the introduction of CEMS?

- What are the major benefits of CEMS to consumers?

- What differences has the introduction of the new system made and what difference is it likely to make in the near future?

Can you describe how the CEMS has been beneficial to you in terms of education, electricity, health and so on?

 (Questions will be used as prompts if they have not already been addressed).

Education

- Education opportunities for citizens

- Digital literacy

Economic development opportunities

- Is there better access to credit?

- Is there better access to employment?

- Have local entrepreneurs been able to participate in the project?

Government, institutions, transparency and accountability

- Awareness of institutions and actors that are involved in the CEMS?

- Awareness of CEMS projects, activities of actors, and events?

- Awareness of government information and services?

- Can the citizens now voice their opinions and hold project actors accountable for the project?

- Has there been a general transparency and accountability in the electricity sectors since the initiation and usage of CEMS?

Empowerment

- Do the citizens have more control to make changes in the design, implementation or usage of CEMS services?

Summarising questions

- Has CEMS provided new useful knowledge? If so, how has this knowledge been used?

- Has CEMS enhanced your opportunities to do anything you did not realise you could do?

Interview Protocol: Top PHCN Bureaucrats

- Please can you explain what development means?

- What do you think the role of the government should be in development?

- What do you think the role of the private sector should be in development?

- Do you think that the private sector should be more involved in "development" than it was before?

- Can you explain how developmental policies in this sector are being made and what institutions are in charge of making these policies?

- Can you briefly describe the measures that have been put in place to implement these policies?

- Kindly tell me how these institutions exist locally?

- Can you describe what opportunities exist for the poor to influence the policy directly or indirectly?

- What are your thoughts on the privatisation reform and CEMS project in general?

- Please can you explain how PHCN came up with the introduction of the pre-paid billing meter?

- Can you kindly explain through what policy the prepaid meter project was channelled?

- How does the technology work in field conditions?

- Can you please describe the possible advantages and disadvantages of the prepaid meter and why you think it is the best choice for consumers, especially the poor?

- Briefly explain how the implementation of CEMS has been going, which areas have been covered and how PHCN intends to expand to other areas?

- Can you please describe the kind of issues that have been reported during the installation and expansion of the CEMS project? How has PHCN dealt with these issues reported?

- Let's move on to the usage and maintenance of the prepaid billing. How has PHCN convinced the consumers to adopt this technology? Secondly, can you describe how PHCN has gone about maintaining CEMS?

- Can you briefly describe the kind of issues encountered during creation of awareness and the maintenance of the CEMS? How has PHCN dealt with these issues reported?

- Briefly describe how the public acceptance of this technology has been so far, and whether it has done well in particular areas and not in others? If so, why?

- How do you see consumers' participation in the prepaid meter project? Can you describe how PHCN has involved consumers in this project? Briefly explain the kind of issues that have been encountered during their participation and how they have been dealt with?

- Do you think ICT should be used to help development or do you think that is not a requirement?

- Can you kindly explain the kind of arrangements that have been put in place for consumers to benefit from the CEMS project in terms of salary and wages, education, health, electricity and so on?

- In the past, consumers described the PHCN as corruption-driven due to overestimated billing and high levels of disconnection and bribery. How has the CEMS project helped change this negative perception that has adversely affected the trust and relationship between PHCN and its consumers?

- It has been reported in the tabloids that PHCN are facing financial problems due to consumer debts and as a result they pay low wages to their workers and also owe them wage arrears. We saw cases where PHCN workers embark on strikes, leaving the country in darkness. Now that the CEMS project is in existence, can you describe to me the steps that are being taken by PHCN to make sure that such strikes do not happen again?

- Can you briefly explain what lessons from the Nigeria experience should be kept in mind while planning introduction of such technology in other developing countries?

- If you had to do it all over again, would you still suggest that the government implement this project and why?

Interview Protocol: Junior Bureaucrats

- How do you see the privatisation reform of the electricity sector?

- What do you think the role of government should be in this reform?

- Do you think the private sector should be more involved in the improvement of the electricity sector than it was before?

- Do you have representatives on the committee set up by the government with regard to the privatisation reform?

- Are you satisfied with the reform? If so how?

- What are your thoughts on the privatisation reform and the CEMS project in general?

- Have you heard about the CEMS project? If yes, tell me about it?

- Do you think the ICTs should be used in improving the electricity sector?

- Do you think the CEMS project represents "development"?

- Did the government provide enough training for the staff with regard to using the system to provide better services to consumers? If so, how?

- What have been the benefits of CEMS to staff?

- Has the introduction of the project truly enhanced transparency and accountability as indicated?

- What are the major obstacles affecting the CEMS project?

- How can these issues be dealt with?

- How do you think the CEMS project can be further improved to meet the needs of the consumers?

Interview Protocol: Contractors

- Tell me about your company.

- Are you a major contractor or subcontractor?

- Please explain the services you are offering with regard to the project?

- How were you able to secure the contract for the job?

- Did you participate in the bidding process for the project? If so, how?

- Why do you think the state is partnering local entrepreneurs rather than just implementing the project itself?

- What do you think the role of the private sector should be in development?

- Do you think the private sector is more or less efficient than the state in delivering services to the poor?

- Do you think that the private sector should d be more involved in development?

- What are your thoughts on the privatisation reform and CEMS project in general?

- Do you think the labour union will support the presence of private entrepreneurs like you in the project?

- Do you see the CEMS project as a good place to invest?

- What are some of the obstacles to investing in the CEMS project?

- Do you think ICT should be used to help development or do you think that is not a requirement?

- Do you think the CEMS project represents development or investment in a new market?

- What role does the state take in this project and what role does the private sector take?

- Are there any conflicts of interest between the state and the private sector?

- If there is something you want to change about CEMS project to better enhance service delivery and meet further developmental goals, what would you recommend?

School of Information Systems, Computing and Mathematics
David Gilbert, Head of School, Professor of Computing
Jasna Kuljis, Head of Information Systems and Computing, Professor of Computing
Tony Rawlins, Head of Mathematical Science, Professor of Mathematics

The use of e-learning to improve numeracy on Schools

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Date: 29th October 2010

STATEMENT OF ETHICS APPROVAL

Proposer: Salihu Ibrahim Dasuki

Title: **Evaluation of ICT development initiative: Case study of Nigeria**

The school's research ethics committee has considered the proposal recently submitted by you. Acting under delegated authority, the committee is satisfied that there is no objection on ethical grounds to the proposed study. Approval is given on the understanding that you will adhere to the terms agreed with participants and to inform the committee of any change of plans in relations to the information provided in the application form.

Yours sincerely,

Dr. Laurence Brooks, Chair of the Research Ethics Committee
SISCM