

UNIVERSITY OF GHANA

**TOWARDS A DECADE OF OPEN GOVERNMENT DATA IN AFRICA:
A FIT VIABILITY CASE ANALYSIS OF GHANA**

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DEGREE**



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DECLARATION

I do hereby declare that this work is the result of my own research and has not been presented by anyone for any academic award in this or any other university. All references used in this work have been fully acknowledged.

I, therefore, bear responsibility for any shortcomings.

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CERTIFICATION

I hereby certify that this thesis was supervised in accordance with procedures laid down by the University.

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DEDICATION

To my Mom: Mrs. Katumi Sidik

Lovely wife: Mrs. Nafisatu Suleiman

Pretty Daughter: Inaaya S. Bankuoru

and

Supervisor: Dr. Eric Afful-Dadzie

For your endless love, support and encouragement.

I shall forever remain grateful to you all.

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LIST OF ACRONYMS AND ABBREVIATIONS

AMA	Accra Metropolitan Assembly
CSO	Civil Society Organisation
CKAN	Comprehensive Knowledge Archive Network
DKAN	Drupal Open Data Content Platform
FVT	Fit Viability Theory
FOI	Freedom Of Information
GODA	Ghana Open Data Alliance
GODI	Ghana Open Data Initiative
ICT	Information Communication Technology
IT	Information Technology
MDA	Ministries Departments and Agency
MOFA	Ministry of Food and Agriculture
NAP	National Action Plan
NITA	National Information Technology Agency
NSC	National Steering Committee
OD	Open Data
ODC	Open Data Commons
ODI	Open Data Initiative
ODbL	Open Database License
OGD	Open Government Data
OGDI	Open Government Data Initiative
OGP	Open Government Partnership
OGPL	Open Government Platform

RTI	Rights To Information
SRID	Statistics Research and Information Directorate
TTF	Task-Technology Fit
TOE	Technology Organisation Environment
W3C	World Wide Web Consortium
WF	World Wide Web Foundation

ABSTRACT

Almost a decade ago in 2011, the Government of Ghana together with other countries in Africa, became a signatory to the Open Government Partnership (OGP) charter – a global initiative aimed at liberating government-controlled data for use, reuse and distribution by citizens and businesses. The project which harnesses modern information technology tools to promote transparency, fight corruption and empower citizens, has however stalled in many African countries including Ghana. For instance, a pre-audit of the Government of Ghana open data web portal and eight others across the continent shows a growing redundancy of the platform and therefore their intended goals.

With varied successes and prospects of Open Government Data (OGD) recorded worldwide, this study sets out to investigate the reasons behind the seeming idleness of OGD activities in Africa in order to determine strategies towards better outcomes. Ghana is used as the case study because it exhibits the relative resource poverty but a maturing democracy which has become notable in Africa. In particular, the study investigates the Task, Technology, Economic, IT infrastructure and Organizational fit viability as a measure of performance of Ghana's OGD implementation. To do this, the Ghana OGD project is compared with global OGD best practices and standards to ascertain whether the current structure of the Ghana Open Data Initiative (GODI) meets established international standards and is sustainable. The study builds on recent research in OGD by empirically determining the suitability and sustainability of a country's OGD set up.

Using a critical realism paradigm and a qualitative research approach, the study focuses on three key actors within the GODI ecosystem: the implementing body, data suppliers and data

users. In all, the study interviewed 6 persons, two each from the actors in the GODI ecosystem. The selection of the 6 interviewees was based on their level of involvement and the strategic role they play in the implementation of GODI. Findings suggest that while the current GODI is fit for the purpose for which it was established, it is however far from achieving its viability objectives. The study ascribed the following reasons for the lack of viability as a function of the low performance of GODI: (1) lack of synergy between stakeholders and relevant actors in the GODI ecosystem. This was largely due to the inability of the implementing body to engage relevant stakeholders whose activities centers on the use of government data. Besides, the implementing agency could not also bring to the fore of citizens the opportunities of the initiative; (2) lack of sustainable funding to the implementing body was prevalent. It was established that, the initiative was not given prominence in terms of budgetary allocation. Thus, the implementing body had to sustain the project from its own budgetary allocation from the Central Government; (3) lack of or poorly trained personnel for the project was also pervasive across its key actors. Again, the initiative was inundated with several technical challenges arising out of the lack of competences of data generators and staff of the implementing body. It can be inferred that, OGD was still evolving among developing economies and Ghana not excluded, the concept was still new and demanded an in-depth technical knowhow which was lacking; and (4) partial neglect of GODI as a result of the implementation of a new e-government project called eTransform. There was a failure to transfer the ideals of GODI to eTransform, thereby making GODI less sustainable.

Practically, the implications of this research is to provide a guide to OGD implementing agencies in developing economies to pay more attention to the legal, technical, environmental, structural and social dimensions which hinders the sustainability of OGDI. Again, the study also provides a theoretical model that extends the fit viability theory which goes beyond the

adoption and implementation to identifying the required task and environmental needs and assesses performance in OGD implementation. The study recommends the development and enactment of a comprehensible OGD policy guideline and strategy to mitigate the barriers besetting OGD initiatives in developing economies. There is a need to also integrate OGD with other primary e-government initiatives in order to enhance visibility. The lack of integration is likely to reduce commitment of governments as other initiatives get their attention. The study also proposes a conceptualized framework that extends the fit viability theory which can be useful in future OGD research.

CHAPTER ONE

INTRODUCTION

1.1. Background

The notion of open government data (OGD) though fairly new, traces its root and largely its objectives from the broader concept of open government (OG). That is, to seek transparency and greater rights of information access for all citizens under the banner of civil resistance movements (Tauberer, 2012). In 2009, a redefined form of OG was birthed by the United States of America (USA). Government and other western powers and placed in the care of the Open Government Partnership (OGP) group. Since then, the Open Government Partnership has seen tremendous growth in its membership. For instance, as of 2017, over 75 governments have signed onto the open government partnership initiative with the aim of making government data available and accessible to its citizens. Following this trend, a number of open government data initiatives (OGDI) have been launched in many different countries, cultures, and political systems while also rapidly expanding to sub-national and municipal levels (Kubler, Robert, Neumaier, Umbrich, & Le Traon, 2018).

Recent studies have documented the growth of open data initiatives across the globe, indicating a gradual interest not only at the central government level but across different local authorities (Zhao & Fan, 2018; Kubler et al., 2018; Klein, 2018; Afful-Dadzie & Afful-Dadzie, 2018; Open Government Partnership, 2017). For instance, as of 2017, there were about 290 local government authorities operating functional OGD web portals around the world (Klein, 2018; Afful-Dadzie & Afful-Dadzie, 2018; Open Government Partnership, 2017).

Open data (OD) refers to data that is available to the public to use, reuse and redistribute without limitation (Reiche & Hofig, 2013). On the other hand, OGD focuses on government-controlled data as a key enabler of governments' openness. As a variant of OD, OGD employs web portal technology to reinforce the view of making public data available for citizens to use without restrictions (Kučera, Chlapek, & Nečaský, 2013). In view of this development, OGD web portals have become the most visible signs OGD implementation. The OGD web portal makes it easy to find open data that can be used, re-used and distributed. Similar to web catalogues, the portal contains metadata records of datasets published across many subjects and disciplines. Uniquely, data on OGD web portals tend to be published in (1) machine-readable forms so as to allow for easy access and re-usability and (2) in their raw and not aggregated forms as to invoke integrity and trust in the contents. Furthermore, in combination with search functionalities, OGD web portals facilitate easy search of datasets of interest. Application Programming Interfaces (APIs) are also often available, offering direct and automated access to data for software applications. The flexibility offered by OGD web portals is meant to promote efficiency, transparency and accountability in governance as well as to facilitate economic growth by means of the creation of interactive data web repository and Mobile applications for citizens and the rest of the world (Ubaldi, 2013).

In recent times, the initiative has seen a rather struggling performance in terms of adoption and implementation across developing countries especially in Middle-east and Africa (Haftu, 2018; Ohemeng & Ofosu-Adarkwa, 2015). Open data web portals in Africa are becoming less active as compared to their counterparts in Europe and America (Ibrahim, Akinwande, & Ibrahim, 2016). For instance, the implementation of the Ghana Open Data Initiative (GODI) to date, has been described as a departure from world acclaimed OGD implementation standards (Afful-

Dadzie & Afful-Dadzie, 2017). In view of this, the study seeks to empirically assess the performance of GODI to ascertain its fit and viability into the future.

1.2. Research Problem

Existing studies have largely focused on the adoption and implementation of OGD but shed little light on the fit and viability requirement of OGD and whether institutional governments adhere to these requirements. That is to say, there is a general lack of assessment of the performance of open data initiatives across OGDs key critical success factors (Chatfield & Reddick, 2017; Fan & Zhao, 2017; Krishnamurthy & Awazu, 2016). Chatfield & Reddick (2017) also bemoaned the single stakeholder perspectives in OGD studies and lack assessment of key actors involved. It is on these premises that this study seeks to identify the task and technology fit requirement and how viable it is based on its *Economic factors, IT Infrastructure, Organizational and Stakeholder readiness*.

Extant research have also focused on issues such as: motivations and determinants of open government participation, challenges and concerns in OGD initiative (Zhao & Fan, 2018; Krishnan, Teo, & Lymm, 2017; Magalhaes & Roseira, 2017; Fan & Zhao, 2017; Zhu, 2017; Yang & Wu, 2016; Wang & Lo, 2016; Ahmadi-Zeleti et al., 2016). Nonetheless, assessment of these studies revealed that factors such as task requirement, environmental, economic and infrastructural feasibility of the OGDIs have not been adequately discussed by researchers. This has therefore led to the existence of several gaps in the current research.

Although OGD is relatively new in Africa, 14 out of 54 African countries have some form of functional OGD initiative. In spite of the relative progress made on the continent as far as OGD

is concerned, few studies have been conducted. The few studies on OGD in Africa have focused on issues such as: government openness, maturity and transparency, analysis of open data portals and services (Shao, 2018; Afful-Dadzie & Afful-Dadzie, 2017; Ibrahim, Akinwande, & Ibrahim, 2016; Geginat & Saltane, 2016; Ohemeng & Ofosu-Adarkwa, 2015). Ohemeng & Ofosu-Adarkwa (2015) focused on GODI and posited that Ghana's project focused too much on the supply side (government agencies) with little emphasis on the demand side (citizens) and lacks proper need assessment in its implementation strategy. Accordingly, Zuiderwijk, Shinde, & Janssen (2018) stated that future research should consider examining the antecedents and consequences of OGD initiatives (i.e., payoffs) by integrating a joint unified theoretical framework to address these gaps.

Further, Vetrò et al. (2016) bemoaned the lack of theorization in the evolving OGD research. That notwithstanding, resource-based theories (Zhao & Fan, 2018; Chatfield & Reddick, 2017; Lee, Ham, & Choi, 2016) and the Technology-Organization-Environment (TOE) theory (Krishnan, Teo, & Lymm, 2017; Wang & Lo, 2016; Yang & Wu, 2016) have dominated in the studies of OGD. These theories however, have had their individual criticism for discounting factors that hinge on the socio-technical fit (Dawes, Vidasova, & Parkhimovich, 2016), technical infrastructure (Rorissa & Demissie, 2010) and economic viability (Ahmadi Zeleti et al., 2016) of OGD initiative, paving way for a multi-stakeholder perspective of its viability. As a longitudinal measure to remedy the above gap, the Fit Viability theory (FVT) has been proposed to properly assess how task and technology fit requirements together with economic, IT infrastructure and organisational viability impact on the performance of open government data initiative.

In the light of several gaps identified in the existing OGD research, the following can be summarised as the leading gaps.

- i. Issue Gap: Myriads of studies in OGD have largely focused on the adoption and implementation to the neglect of the overall performance (Task-Technology Fit and Economic, Organisational and Infrastructural Viability) of OGD. Additionally, almost a decade after its implementation in Africa, OGD needs further appraisal after its inception.
- ii. Context Gap: Contextually, existing studies on OGD in Africa is relatively low. Europe, America and Asian context have dominated in OGD studies. Accordingly, this research conducts a longitudinal study into OGD in Africa with a focus on GODI.
- iii. Theory Gap: Relevant theories have been espoused to analyse the concept of OGD. Though FVT is widely applied in IS literature, the focus has largely been on technology adoption. This paper demonstrates another area that the FVT can be applied.

It can be deduced from the above that, OGD research across developing economies is still evolving. In that regard, there is the need for further studies in the emerging field because of the diverse possibilities it presents by researchers. Currently, a limited number of studies has focused on OGD in African and for that matter Ghana's OGD. It is therefore imperative to respond to this call leveraging on the FVT for more analysis on the phenomenon as enumerated in literature with the aim of contributing to the body of knowledge.

With regards to this study, fit refers to the extent to which the capabilities of OGD meeting the accepted requirements of the task. Viability on the other hand, refers to the extent to which the organisation and its critical success factors are ready for implementation. While the fit

requirement measure factors such as key technical and legal characteristics, the viability measures the general economic, human and technological resources which beset the implementation of the initiative.

1.3. Research Purpose

The main purpose of this study is to assess the implementation of OGD in Ghana almost a decade after its implementation in order to determine strategies towards better outcomes. The study seeks to evaluate how task and technology fit requirements together with economic, IT infrastructure and organisational viability has impacted the overall performance of GODI. The study focuses on the three key actors in the GODI ecosystem: Implementing Agency, Data Suppliers and Key Data Users (Demanders).

1.4. Research Objectives

The objectives of the study in relation to the purpose are to:

1. Determine the fit of the implementation of open government data in Ghana.
2. Determine the viability of the Ghana open data initiative since its inception.
3. Determine the level of performance of the Ghana open data initiative over the period.

1.5. Research Questions

The underpinning research questions to be addressed by this study are:

1. How fit is the implementation of government open data in Ghana?
2. How viable is the Ghana open data initiative since its inception?
3. What is the level of performance of the Ghana open data initiative over the period?

1.6. The Significance of the Research

The expected outcome of this study in respect of research is to seek and add to the body of knowledge by probing into the myriad of OGD. This is significant because scant literature exists concerning the assessment of OGD in developing economies.

In respect of practice, the study set to provide guidelines to enhancing decision making based on the findings in the implementation of OGD initiatives across developing economies.

In relation to policy, the findings from the fit and viability analysis of GODI would serve as a framework or blueprint to the government in the initiation and implementation of such innovations in Ghana.

1.7. Chapter Outline

Chapter one is the introduction to the study which covers the study background, research problem, purpose and objectives of the study, research questions, significance and how the research is organised.

Chapter two presents a general overview of relevant literature on the concept of OGD, its implementation in Africa, challenges and opportunities it presents to users. It further presents an analysis of OGD web portals and their functionalities across Africa.

Chapter three discusses the theoretical frameworks adopted for the study, the justification for the choice of the theory for the study and its limitations.

Chapter four discusses on the research methodology which further highlights on the research paradigm, strategy and sampling technique utilized. Again, data collection techniques and the data analysis approach used were also expounded in this chapter.

Chapter Five describes the case and the GODI implementation strategies.

Chapter Six is the research findings which elaborates on the presentation of findings from the case in-line with the FVT.

Chapter seven covers the data presentation, analysis and discussions of findings presented.

Finally, chapter eight presents the conclusion of the study. The section includes the chapter summary, recommendations, implications and limitations and also gives directions for future research

Study references and appendices follow.

CHAPTER TWO

LITERATURE REVIEW

2.1. Chapter Overview

The previous chapter discussed the overview of the study, background and problem statement. The purpose and significance of the study were also discussed. This chapter reviews pertinent literature on E-government, OD, and specifically OGD in its implementation and challenges. The chapter further reviews literature on OGD to reveal current knowledge gaps for future research. The chapter again discusses theories used in the OGD studies and finally identifies research gaps in literature and future research directions.

2.2. Overview of Concepts

The following sections give a broad overview of concepts that are related to this study. The concepts of e-government, OD and OGD have been defined. The section also discusses open data governance, Open Data roles and responsibilities as well as data publishing standards. As already suggested, OGD initiatives emerged only recently. As a result of this, OGD portals tend to be part of a larger e-government project. This section thus, present works related to e-government emphasizing on government data portals and their relevance, and then proceed with work related to OGD. Finally, the study presents general challenges besetting OGD implementation across the world.

2.2.1. E-Government

Governments across the globe are increasing their presence on the web through several technologies. Electronic government (e-government) defines the context to which government in a country establishes its presence on the internet (Krishnan et al., 2017). As a key public

sector ICT innovation, Fang (2002) indicated that e-government is the use of online-based applications to provide to citizens and businesses unlimited access to government-controlled businesses and services. The goal is to improve the quality of service and provide greater opportunities for citizens to participate in a democracy. Government presence online comes with a range of benefits. For instance, it brings about cost reduction and efficiency in government services, improves transparency and accountability and ensures national business competitiveness (Rorissa & Demissie, 2010). For these stated objectives, government across the world are investing massive amounts of resources to achieving them (Krishnan et al., 2017). That notwithstanding, the success of implementing an e-government initiative in a country is contingent upon the engagement of citizens as key actors in governance (Tan & Pan, 2003). Accordingly, the participatory principles of citizens in an e-government initiative is a key enabler for government (Chatwin & Arku, 2018). For instance, government ability to foster congenial and collaborative information sharing among disparate data users on its e-government platforms. Additionally, effective e-governant projects provide direction to the creation of an environment in which citizens can be more active and supportive of their governments (Porumbescu, 2016). It is for this reason that government across the globe establish open data portals to make data accessible to citizens (Ohemeng & Ofosu-Adarkwa, 2015). Thus improving on governments' willingness to use ICT towards enhancing the provision of quality information, effective communication for informed decision making (Vicente & Novo, 2014).

Moreover, developing economies like Africa has long adopted e-government in their quest to liberate and make public information available and accessible (Rorissa & Demissie, 2010). However, the current status of e-government services in developing economies and the opportunities they present to citizens and businesses are not well harnessed (Heeks, 2002).

Besides, scant literature has focused on e-government services in Africa. In recent times for instance, (Ofoeda, Boateng, & Asmah, 2018; Larkotey, Effah, & Boateng, 2017; Rorissa & Demissie, 2010) noted that, e-government portals in developing economies still need to be enhanced. In addition, earlier studies perceive Africa as a single, homogeneous, and monolithic entity (Heeks, 2002). However, Heeks (2002) concludes that this description is not accurate, because the impact of e-government is greater in the least developed economies, of which the majority are African countries. In recent past, the concept of e-government was limited to the presence of government products and services on an online portal. This concept, has however evolved with the advent of “open government” hence, OGD is now considered a subset of e-government (Jetzek et al., 2016).

2.3. Concept of Open Government Data

In order to give some context to the study, the following subsections provide several definitions related to open data, public data, government data and its related terminologies.

2.3.1. Open Data Defined

Digital revolution has given rise to rapid and seamless in the generation and accessibility of data. As a result, two key features of data are impacted: data accessibility, by making data readily available to users at any time and affordability, making the cost of reproduction and distribution of data economically feasible (Nilsen, 2010). For instance, the evolving phenomenon of “open themes” are gradually pushing governments to liberate data that were hitherto hidden in data repositories to citizens for use and further redistributed (Harrison, Pardo, & Cook, 2012). Openness makes especially digital data non-excludable and a public good for equitable distribution and shared alike (Ostrom & Hess, 2007). Therefore, data that is made

available to the public for use with limited restrictions can be referred to as open data (Reiche & Höfig, 2013).

The OpenDataHandbook (2012) defines OD as “data that can be freely used, reused and redistributed by anyone - subject only, at most, to the requirement to attribute and share-alike”. Vetrò et al. (2016) also indicated that, OD is any data available to the public subject to unlimited access without any inconveniences, discrimination or modifications for easy and redistribution. Additionally, OD should come at no cost to the user and must be available in a machine-readable format for easy interoperability in its licensing states (Ubaldi, 2013). Open data have generated a great deal of anticipation around the world with its unlimited possibilities to empowering businesses while spurring innovations among citizens (Jetzek et al., 2016).

2.3.2. Public Data Defined

Data made available for free to the general public is referred to as public data (Krishnamurthy & Awazu, 2016). However, Public data though free is not necessarily open. An extreme example of public data is government contractual or procurement document. This document though freely accessible, the effort required by citizens to locate and access it within the public agency can be daunting. However, if such document is digitalized and made available and accessible online in a standard format, then it becomes an open data (Ubaldi, 2013).

2.3.3. Open Government Data Defined

Open government data (OGD) is simply any government-controlled data that is made available to the public for use, reuse and subsequent distribution (Kučera et al., 2013). As a subset of Open Data, OGD data includes varied datasets such as government budget and spending,

population, census, geographical, parliament minutes, etc. OGD also includes data in repository indirectly controlled or possessed by the state institutions such as ministries, department, and agencies related to health, education, tax and sanitation. In line with the objectives of the broader OG, developing economies are demonstrating their commitment to opening government-controlled data by joining the Open Government Partnership (OGP) (Zuiderwijk et al., 2018).

2.3.4. Right To Information (RTI)

The United Nation General Assembly in 1946 enacted the freedom of information charter. The charter later in 1948 was strengthened through the Universal Declaration of Human Rights (Donnelly, 2013). The Right to information (RTI) law establishes the rights of citizens to relevant information on the activities of government (Ubaldi, 2013). The implementation of RTI laws has heightened access to government-controlled information over the past decades by civil resistance movements. This has increased the number of countries implementing the RTI across Eastern Europe, Asia, Latin America and most recently Africa and Middle East (Florini, 2007). The law provides access to government-held information without any discrimination subject to minimal restrictions. This gives citizens the opportunity to know what government is doing while promoting accountability and transparency towards the practice of good governance (Yannoukakou & Araka, 2014).

2.3.5. Difference Between RTI and OGD

The two movements RTI and OGD are closely related in terms of some underlying principles but differ in terms of their guiding principles and approach to liberate public data in the possession of public sector institutions to citizens (Ubaldi, 2013). Fundamentally, RTI activists

(mostly legal and media practitioners, transparency and accountability organisations) for instance drives their efforts towards the constitutional rights of the citizenry to demanding transparency and accountability from their governments. This civic right according to the RTI advocates is achieved through the RTI law which compels public agencies to make data available to citizens (Janssen, 2012). Notably, datasets sought for by this group are largely government revenue and budgetary allocations, documents on procurement and contractual agreements, reports and minutes of commissions, committees and relevant public sector agencies (Afful-Dadzie & Afful-Dadzie, 2017a; Agrawal, 2012). However, a closely look at the proponents of OGD (mostly private citizens, businesses, developer and civil society organisations) argues that in order for governments to achieve it transparency and accountability objective, spur innovations and drive economic growth for its citizens, conscious efforts must be made to make public data available to all citizens at no cost for them to use, reuse and distribute (Ubaldi, 2013; Janssen et al., 2012). In doing so, OGD requires governments to make its data available and accessible through the deployment of a web portal technology where all public data is published in multiple machine-readable formats. This technical dimension clearly distinguishes the guiding principles of OGD from RTI. Generally, while RTI crusaders rely on legal-based principles, OGD activists rely more on the technical possibilities of data and on the proprietary argument that government data belongs to the public taxpayers (Janssen, 2012). Spurring Innovation, promoting economic growth are some of the key objectives of the proponents of OGD. These objective however, are less important to RTI advocates (Yu & Robinson, 2012).

That notwithstanding, both movements are gradually growing closer: OGD emphasizes on the growing principles of the RTI movement of proactive disclosure as a means for all members

of society to enjoy the right to information and not just the individuals filing a request. Thus, more attention is being given to the efficiency argument of liberating public data, to purge governments from the burden of incessant requests for information and improve their information management acquisition and transmissions (Darbishire, 2010). By extension however, both movements have, throughout the course of their advocacy, encountered considerable obstacles from key public sector officials who are entrenched to the culture of holding on to data while alluding to arguments of secrecy and confidentiality impeding access to data and information. This concern seems to be raised by OGD on top of the accountability or reputation concerns associated with freedom of information (Krishnamurthy & Awazu, 2016).

2.3.6. Link Data

An important feature of web data portals is the ability to link it to other datasets on different platforms. Link data refers to the machine-readable data present on web platforms which are also linked to other external datasets (Bizer et al., 2009). Linking data on is one of the five-star web deployment schemes for open data development for connecting structured data on web platform during the development and publishing of data on the Web (Volz, Bizer, Gaedke, & Kobilarov, 2009). Linked data is increasingly becoming one of the best practice where varied documents are linked to other data. The evolution of the Web enables the exploration of new relationships between data and the ensuing development of new applications (Chatfield & Reddick, 2017).

2.4. Open Data Initiative

Developing economies are gradually embracing the open data agenda with the aim of creating a common platform for citizens, businesses and private individuals to access and utilize open data after the EU Directive 2003/98/EC. The initiative has evolved and growing into a strong movement highly patronized by the European Union (EU) member states and civil society (Schwegmann, 2012). On the contrary, OD is not the preserved of the developed economies. In recent years, OD has seen a tremendous increase in its adoption and implementation across developing countries in the Middle-East, Africa and Asia (Sabiti, 2017).

2.4.1. Open Government Partnership

The Open Government Partnership (OGP) is a global organisation with the intent of securing achievable commitments from governments (both at the national and subnational level) across the world towards promoting openness of governments. This commitment are geared towards liberating government controlled data to the citizens to fight corruption and promote transparency, harness new technologies and strengthening governance (Ubaldi, 2013). Activities of OGP member countries are superintended by a National Steering Committee (NCS). The NCS comprises representatives of government and civil society organisations whose activities are in line with OGP objectives. The Open Government Partnership was formally launched on September 20, 2011 on the back of a UN General Assembly meeting where Heads of State from 8 founding countries endorsed the Open Government Declaration. The partnership since its creation have received over 2,500 commitments from governments comprising more than 75 participating countries Open Government Partnership, 2017).

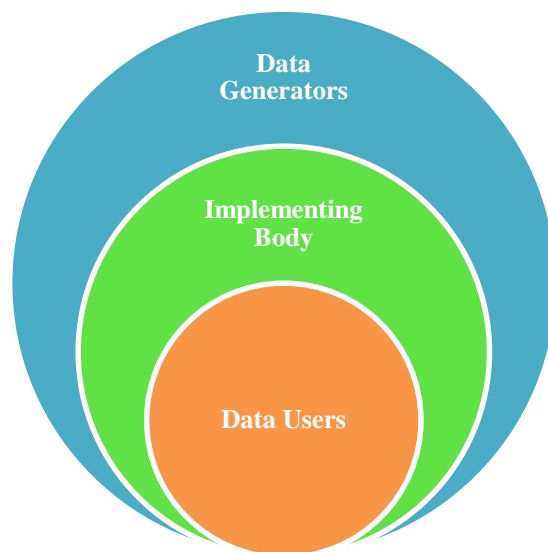
2.4.2. Open Government Data Ecosystem

Simply making data available to the public is not enough to make that data useful. Citizens are not necessarily interested in data: they are interested in services being built with the available data (Dawes et al., 2016). Therefore, an active network, "open government data ecosystem," is needed to facilitate the interaction and communication amongst all actors involved in the process of implementing an OGDI (Najafabadi & Luna-Reyes, 2017). The open government data ecosystem consists of different actors and data users with different needs, challenges, problems, expectations, roles and envisaged opportunities (Afful-Dadzie & Afful-Dadzie, 2017b). This presents a multilevel perspective to open data for which all actors can harness for their individual good. The strategy coordinates both internal and external actors comprising the implementing body, data generators and data users (stakeholders and interested parties) and drives their efforts towards developing and sustaining OGDI (Jetzek et al., 2016). Only then can these actors be convinced to generate and share data for re-use and distribution in order to realize innovation efforts and new products and improved services enumerated in the guiding principles of the OGP (Manolea & Cretu, 2013).

As it is shown in Figure 2.1, the network corresponds to the flow of generation, publication and utilization of data in the ecosystem, starts from the data generators in the public sector. Following citizens quest for data from government, the implementing body acting on behalf of government develops the platform to publish the datasets for easy access. These datasets already residing in governmental databases, are fed onto the platform developed by the implementing agency for data users to access and transform them into benefits when consumed by end-users in society (Najafabadi & Luna-Reyes, 2017). In the ecosystem perspective, the benefits generated out of the government data by data consumers reinforce OGD initiatives for more value creation (Ahmadi Zeleti et al., 2016). Thus, once the benefits of opening

government data are perceived by citizens and business, government will be pushed by the ecosystem to open more data. Therefore, the availability of valued data becomes more of a “core expectation” in the society, and government is pushed to increase the capacity and quality of generated datasets. Ultimately, this results in the efficiency and effectiveness of policies and procedures to open data in the public sector (Reggi & Dawes, 2016).

Figure 2.1: Open Government Data Ecosystem



Source: Author's Own construction

2.4.3. Open Data Standards

The tenet of joining the OGP stipulates that an independent expert must validate the commitments of government demonstrated in four critical areas. These key critical areas are economic transparency, access to information, asset disclosure and citizen engagement (Ubaldi, 2013). An eligible country is required to present a letter of intent signed by a cabinet representative indicating the countries willingness and agreement to the terms of the OGP declaration. Further, the would-be-member country has to establish an agency and a lead person to coordinate the activities and correspondences on behalf of the country (Linders, 2012).

2.4.4. Open Data Publication Criteria

The following requirements apply generally to open data and are adopted by OGP: Ministries Departments and Agencies (MDAs) must create a data inventory and update it at least annually on an ongoing basis. Ministries must establish plans for expanding public access to government data and report their progress consistently with the change management plans issued by the Open Government Program (Open Government Partnership, 2017). Open data plans must prioritize and expand data publication efforts on data that enables citizens and sectors to create value from government data. Again, data generators in MDAs must incorporate the principle of openness in their data generating activities (Dietrich et al., 2012). Only data that meets the requirements of the Open Data Approval Checklist, as issued by the Open Government Program, may be posted as open data. Furthermore, Open data must be published on the Open Data Portal “Data.Gov.” and subject to the Open Government License. Additionally, individuals must not be required to pay, register or identify themselves in order to access, use, adapt or distribute open data (Dietrich et al., 2012).

2.4.5. Open Government Data Requirements

A number of OD and OGD requirements have been authored over the years. Widely accepted of these are the World Bank OD Toolkit, the World Wide Web Consortium (W3C) web data standardization and the OD handbook. The OD Handbook for instance critically discusses the legal, social and technical aspects of OD and is widely used and most fit for the implementation of OGD (Dietrich et al., 2012). For instance, the handbook documents why and how to open up data, the requirements for data openness and the guiding principle for setting up an OGDI (Lee, Cyganiak, & Decker, 2014). The requirements in Table 2.1 summarizes the basic requirements to be considered in the assessment of open government data for inclusion in the

Open Data Web Portal. Thus, government data may be proposed as completely opened if it largely satisfies the requirements in Table 2.1.

Table 2.1: Open Data (Datasets) Requirements

Requirement	Characteristics
Complete	Data is provided in the most comprehensive manner possible.
Primary	Data is generated as collected at the source, with the finest possible level of granularity, not in aggregate or modified forms.
Timely	Data is made available as quickly as necessary to preserve the integrity and value it possesses.
Accessible	Data is available to the widest range of users for the widest range of purposes.
Machine-readable	Data is well structured to allow easy automated processing.
Access Is Non-Discriminatory	Data is available to anyone, without registration or cost.
Formats Are Non-Proprietary	Data is available in a format over which no entity has exclusive rights and control.
Reusable	Data is subject to minimal copyright, patent, trademark or trade secret regulation. Reasonable privacy, security and privilege restrictions may be allowed as governed by other statutes.

Source: Dietrich et al. (2012)

In making a determination if data is free from legal, contract or policy restrictions, and can be made available as open data, MDAs must act in conformity with the Open Data Approval Checklist issued by the Open Government Program (Kubler et al., 2018).

2.4.6. Open Data Metadata Requirements

The open data handbook documentation requires that all open data must be fully described using the Open Data Metadata Application Profile (ODMAP). The ODMAP documents the set of metadata properties and encoding schemes that must be used to describe resources on the Open Government Data Portal (Kubler et al., 2018). For instance, the ODMAP assists the platform developers, and the data generators in the MDAs to create and manage the data in the data warehouse to be populated onto the data portal. Additionally, it affords data users sufficient information to understand the strengths, weaknesses, analytical limitations, and security requirements of the data; as well as how to process the data (Janssen & Zuiderwijk, 2012). Again, all open data must be published in one of the following formats in Table 2.2 unless a specific exception is granted by the implementing agency.

Table 2.2: Open Data Metadata Requirements

Data Format	Abbreviation
Comma Separated Values	CSV
JavaScript Object Notation	JSON
Keyhole Markup Language	KML
Open Data Protocol	OData
Rich Site Summary	RSS
Shapefile	SHP
Web Feature Service	WFS
Web Map Service	WMS
Microsoft Excel Format	XLS, XLSX
Extensible Markup Language	XML

Source: Zuiderwijk et al. (2012)

2.5. Open Data in Africa

In spite of the high expectations of governments since the establishments of the OGP in 2011, there seems to be a growing redundancy in the implementation of OGDI in Africa (Kassen, 2014; Manolea & Cretu, 2013). As of 2016, 9 out of the 11 African countries that have signed the OGP declaration, have functioning open government data web portals (OGP, 2016). The nine African countries comprise of Ghana, Burkina Faso, Tunisia, Morocco, South Africa, Kenya, Nigeria, Sierra Leon and Tanzania. To understand the level of progress made in Africa, Table 2.3 provides an inventory of the current content and service on the open government data web portals. Table 2.3 summarizes features on the technical capacity (web content and functionalities), revealing features (standards) currently available and those missing across the various OGD country web portals.

The open data handbook documentation (Dietrich et al., 2012), the W3C benchmark for the publication of OGD (Bennett & Harvey, 2009) and the World Bank Open Data guidelines (Herzog, 2014), listed a number of requirements necessary for establishing an efficient OGD web portal. Several authors have relied on these guidelines in their studies to assess OGD portals across the world. For instance, Afful-Dadzie & Afful-Dadzie (2017b) used the W3C and the World Bank technical guide to assess the 7 OGD web portals in Africa for its content and functionalities. These standards emphasize on key features, contents and services of OGD web portal. Amongst them include, (1) publication of data in its raw and machine-readable form, (2) provision of metadata catalog, (3) Search functionalities and (4) access to data in multiple formats. Consistent with these standards and other OGD best practices, a cursory analysis of 9 African OGD web portals were carried out. The audit strategy for the analysis covered aspects of technical functionalities, services and content as shown in Table 2.3. The specifics included; total datasets published (as at December 2018), data format available,

access to data in multiple formats, meta-data catalog and profile, ability to search data, link to external sites, date of last published data, social media presence, visualization of data and ability to suggest datasets.

Pursuant to the guiding principles, the web content analysis was carried out on each country's web portal based on the adopted approach. Features such as social media plugins and presence, request and suggest datasets, search for data, links to external sites and total number of data sets published were visible on the home page. On the other hand, feature such as data catalog and profile and data format are only available on each published dataset. Table 2.3 presents the result of the audit of the 9 OGD web portals in Africa. Features or services available are assigned the symbol (√) while those not available are assigned the symbol (x). Tunisia had the highest number of datasets of different categories published followed by Kenya with 1,953 and 1,034 datasets respectively. However, Nigeria had the least number of published datasets as of December 2018. Ghana as at the same period had a total of 133 datasets published from different categories such as agriculture, health and energy. Across the portals, the commonest data format was CSV while other formats such as pdf, xls, xlsx were also visible. Regrettably, machine-readable and no-proprietary data format which is a key requirement for setting up OGD portal received little attention. While Kenya, Sierra Leone and Nigeria provided multiple data formats such as GeoJson, Json and xml, Ghana and Tanzania had only CSV data format present. Generally, datasets published were cataloged across the portals. Meanwhile, on the availability of current datasets, Ghana, South Africa, Morocco and Nigeria datasets were not current. This contravenes the open data handbooks which among other criteria emphasizes the publication of current datasets (Lee et al., 2014). Moreover, all countries had social media plugins on their web portals.

Table 2.3: Features of OGD Web Portals Across OGP Members in Africa

COUNTRY	TOTAL DATASET	DATA FORMAT AVAILABLE	ACCESS TO DATA IN MULTIPLE FORMAT	DCAT OD META-DATA PROFILE	ABILITY TO SEARCH DATA	LINKS TO EXTERNAL SITES	LAST PUBLISHED DATE	SOCIAL MEDIA PRESENCE	REQUEST FOR DATA	VISUALIZED DATA	SUGGEST DATASET
Ghana (http://data.gov.gh)	133	CSV	x	√	√	√	February, 2016	√	√	x	√
Kenya (http://icta-kenyaopendata.opendata.arcgis.com)	1034	GeoJSON, xml, HTML, JSon	√	√	√	√	October, 2018	√	√	√	√
South Africa (http://data.gov.za)	409	.doc, xlsx, CSV, PDF, PNG	x	√	x	√	October, 2015	√	√	x	x
Sierra Leone (http://opendatasl.gov.sl)	144	Pdf, CSV, xls, xlsx, png, xlb, Json	√	√	√	x	March, 2018	√	√	√	x
Tanzania (http://opendata.go.tz)	186	CSV	x	√	√	√	August, 2018	√	√	√	√
Tunisia (http://data.gov.tn)	1953	Pdf	x	x	√	√	February, 2018	√	√	√	x
Morocco (http://data.gov.ma/)	136	Xls, doc, xlsx, pdf	√	√	√	√	January, 2015	√	√	√	√
Burkina Faso (https://data.gov.bf)	375	CVS, xlsx, ods	√	√	√	√	February, 2018	√	√	√	√
Nigeria (https://opendata.com.ng)	34	HTML, Json, pdf, GeoJson, xml, CSV	x	√	√	√	February, 2014	√	√	x	x

Key: x - Functionality/Service Not Available
√ - Functionality/Service Available

Source: Author's own construction

2.6. Prospects and Challenges of OGD

2.6.1. Prospects of OGD

Janssen et al. (2012) in their study noted that OGD has the potential to create and generate more value than the selling of data sets. These benefits include (1) political and social, (2) economic, and (3) operational and technical benefits with the political and social benefits noted to be a significant category. For instance, government data on living standards of citizens, and their re-use, are key resources for social innovation and economic growth. Also, OGD provides new opportunities for governments to collaborate with citizens to evaluate public services by giving citizens access to data about those services. The economic value and the potentials gained from OGD have also been celebrated, and recently estimated as the equivalent of 3 trillion USD per annum globally (McKinsey, 2013). Again, businesses and entrepreneurs can leverage on OGD to better understand potential markets and build new data-driven products (Ubaldi, 2013). Technically, OGD has the potential to improve on economic growth and also contribute to public values (transparency and accountability through the re-use of data collected from the OGD portal (Jetzek, Avital, & Bjørn-Andersen, 2014).

Making government data open has the propensity to stimulate innovation, and promote economic growth, through effective use of public sector data. This is vital to the growth of the knowledge economy (Lee et al., 2016). Again, there is evidence to show that OGD has had a positive impact on Return on Investment (ROI) especially for businesses (Chatfield & Reddick, 2017). By opening public data, users can also validate and verify whether conclusions drawn from their data are correct and justified. Ohemeng & Ofosu-Adarkwa (2015) for instance indicated that OGD strengthens accountability, build trust, and improve citizen satisfaction through effective participatory governance. Further, another benefit of OGD is feedback from citizens after reuse of government product and services to be able to improve on it. Moreover,

liberating government data to citizens for effective utilization has the ability to tap into the collective intelligence of the public (Krishnamurthy & Awazu, 2016). Additionally, access to OGD in its genuine format and quality can generate better alternatives and help make better decisions than even the smartest people can do on their own (Gascó-Hernández, Martin, Reggi, Pyo, & Luna-Reyes, 2018).

2.6.2. Challenges of OGD

While open government data can potentially provide numerous benefits, its adoption and implementation have faced a number of challenges worldwide. Some of the challenges are privacy protection, confidentiality, data misuse and misinterpretation, legal issues, data quality, data completeness and many other concerns (Zuiderwijk & Janssen, 2014). A number of these challenges stated above come from the actors in the OGD ecosystem. For instance, in relation to the implementation agency, challenges such as the OGD task and technical complexities in the publication of data may be visible. Again, the reluctance of data generating agencies to release data to the implementing agency for publication also challenges OGD initiative. A critical challenge to the implementing agency is the quality of data generated by the data supply personnel in the MDAs. For most OGD implemented countries, data protection legislation restrict the liberation of public data (Janssen et al., 2012).

Another challenge is that public data are frequently offered in different formats, with missing catalog or metadata descriptions that clearly describe the data. Again, data is sometimes published in formats that are not machine-readable (Ubaldi, 2013). Data portal managers in some cases resolve this problem by presenting the data formally, semantically and combine data set and visualize the results in understandable representation. These challenges however, limits the reusability of data by users. However, the number of successful integrations has been

limited due to many challenges that can be political, social or technical (Algemili, 2016). In most cases, the stakeholders of open data including government agencies find themselves overwhelmed by the amount of unstructured data that makes the benefits of open data services in reasonable doubt (Dvir, 2018).

2.7. Review of Literature on Open Government Data

Reviews conducted during research enables the researcher to address unattended issues, fill in gaps in research, discover a basis for a research topic and also provide justification for the choice of a research approach (Boateng, 2016). Review of literature also enhances the identification of research problems that need to be addressed or studied on to provide solutions and as well provide a broad view on existing knowledge. Boateng (2014), used 5 phases to review literature. These five phases include (1) classification of the literature, (2) theories applied, (3) context of research and methodological approach, (4) focus or technology adopted and (5) research gaps, issues and challenges discussed. The following sections follow Boateng (2014) approach to a review of literature. The review consists of 12 selected articles shown in Table 2.4 in the area of OD and OGD.

Table 2.4: Article Distribution on Open Data and OGD

Article	Focus or purpose	Methodology & Country	Theory	Issues and Gaps associated with OGD research
Chatfield & Reddick (2017)	Analysis of open data portals	Mixed Australia	Resource-based theory	<ul style="list-style-type: none"> - Open data portals should be contingent with the task requirements of the ODI. - The technical viability of OGD needs to be assessed. - Multi-stakeholder involvement is key
Krishnamurthy & Awazu (2016)	Efficient use of OGD portals	Quantitative Cross-country analysis	Resource-Based Theory	<ul style="list-style-type: none"> - Citizens understanding of the OGD. - Set clear policy guidelines and need assessment.

Article	Focus or purpose	Methodology & Country	Theory	Issues and Gaps associated with OGD research
				- Periodic assessment of its feasibility.
Wang & Lo (2016)	Adoption of OGD among public agencies	Quantitative Taiwan	TOE	- The incentive of participation of public agencies - Risk-aversion of organizations participating in OGDI. - Public participation in the initiative.
Krishnan et al. (2017)	Factors that determine open government implementation	Quantitative Cross-country analysis	TOE	- Need for a longitudinal research - To determine the technical requirement of e-government adoption. - Government maturity level of e-government implementation.
Yang & Wu (2016)	The determinant of open data publications.	Quantitative Asia	TOE	- Perceived efforts and risk factors. - Privacy and security concerns - Feasibility of OGDI
Ahmadi Zeleti et al. (2016)	The economic benefit of OGD	Qualitative UK	Design science approach	- The economic feasibility of OGD needs to be examined. - Build business models to make an impact on startup businesses. - Need for a theoretical foundation for OGDI
Afful-Dadzie & Afful-Dadzie (2017a)	Comparative analysis of OGD and freedom of information.	Quantitative Cross-country OGD analysis	Text mining/ Topic modeling	- Disclosure, access and cost of open data themes. - The need for assessment of city-based OGD activities.
Ohemeng & Oforu-Adarkwa (2015)	Understanding the effectiveness of the GODI.	Qualitative Ghana	Resource-based	- Need to look at the demand side of the initiative - Citizens participation - Passage of the RTI bill.
Krishnamurthy & Awazu (2016)	Challenges and opportunities faced by Data.gov initiative.	Qualitative Cross-country OGDI	Grounded theory	- Lack of metrics to evaluate the cost and benefits of OGDI. - The need to look at the task requirement and capacity building

Article	Focus or purpose	Methodology & Country	Theory	Issues and Gaps associated with OGD research
				- Appraisal of OGDI over time
Afful-Dadzie & Afful-Dadzie (2017b)	The relative importance of OGD for media practitioners	Quantitative / Conjoint analysis	Open government preference model	- The need to look at the preference of data users.
Dawes et al. (2016)	The OGD ecosystems	Mixed Socio-technical systems theory	Open data resource	- To explore factors that affect the performance of OGDI. - Assessment of OGDI and technologies.
Shao (2018)	Barriers to OGD	Qualitative/ Tanzania	Open data resource	- To explore factors to assess national OGD. - Identify factors that promote the sustainability of national OGDI

Source: Author's Construction from Literature Review

2.7.1. Discussion of Issues and Gaps for Future Research in Open Data and OGD

The discussion on issues that arose from the review of literature on OGD identifies certain key areas in the study of OGDI that need to be addressed. The classification of studies conducted on OGD in Table 2.4 summarizes the various gaps, issues and challenges associated with the implementation of OGDI as well as open data web portals, related technologies and services. Many of the studies revealed that task requirement issues (Chatfield & Reddick, 2017; Krishnan et al., 2013) and availability of multi-stakeholder participation (Wang & Lo, 2016) to determine the data need of the public possess as barriers to the successful implementation of OGDI. Other studies also emphasized that increase in resource allocation and citizens interest and participation (Shao, 2018; Ohemeng & Oforu-Adarkwa, 2015; Afful-Dadzie & Afful-Dadzie, 2017b) are to successful open government participation (Fang, 2002). However, very few studies captured the privacy and security concerns that determine the performance of the implementation of OGDI. For instance, Yang & Wu (2016) and Wang & Lo (2016) focused

on some privacy and security concerns of OGD initiative. Again, scant research focused on the feasibilities of OGD such as its economic and technical value (Chatfield & Reddick, 2018; Ahmadi Zeleti et al., 2016; Krishnamurthy & Awazu, 2016) to determine the overall performance of OGDI. It is for this reason that Krishnamurthy & Awazu (2016) indicated the need for a metric to evaluate the cost and benefit of OGDI. The need, therefore, arises for further studies on the effective evaluation of the performance of OGDI across developing economies.

Additionally, review of literature on OGD revealed a gap in theory and framework. Largely, OGD papers reviewed adopted resource-based and Technology, Organizational and Environment (TOE) framework to study the adoption and acceptance of OGD (Shao, 2018; Afful-Dadzie & Afful-Dadzie, 2017b; Ohemeng & Ofosu-Adarkwa, 2015; Krishnan et al., 2013). Other studies also developed models and blueprints by integrating well-known models to study OGD. Ahmadi Zeleti et al. (2016) for instance used design science approach to develop a blueprint to aid in examining the progress made in OGD initiatives. A handful of researches also conceptualized knowledge in literature to explain the concept of OGD using the socio-technical theory (Dawes et al., 2016). Arguably, very few studies have considered the task requirement and the viability context of OGD with respect to the fit-viability theory as a suitable theoretical lens. There is, therefore, the need for a longitudinal study to focus on the task-technology and environmental fit of OGDIs. Additionally, its economic, infrastructural and organisational viability need to be explored. Thus, the assessment of fit and viability of the Ghana Open Data Initiative by applying the FVT as a theoretical foundation.

2.8. Chapter Summary

In summary, the purpose of this study is to explore the implementation of OGD in a developing economy and do a fit viability analysis of the GODI after its establishment. The chapter defined the concepts of e-government, open and public data and open government data. The study reviewed open government data initiative, standards and requirements of OGD and also open data portals in Africa. The review also revealed issues and challenges associated with the OGD. The review also provided direction for gaps in OGD research and justification for further research. The succeeding chapter presents an overview and discussion on the FVT as adopted as the theoretical foundation of this study. The FVT will therefore, be an appropriate theory for this study and will be discussed in detail in the next chapter.

CHAPTER THREE

RESEARCH FRAMEWORK

3.1. Chapter Overview

This chapter discusses the research framework after discussing pertinent and contemporary literature relating to e-government, open data and open government data in the previous chapter. The concept of fit-viability was first posited by Tjan (2001) for evaluating the organizational implementation of an internet initiative. The basis of fit and viability is that the performance of an organization can best be assessed whether it is fit for purpose and viable enough for the growth or sustainability. The Fit and Viability Theory (FVT) was adopted for this study because, the two constructs were deemed appropriate for assessing the performance of an organization that (1) has implemented a programme for close to a decade and (2) has so much performance expectation from the public regarding IT implementation. In fact, these factors among other organizational factors are critical to the successful implementation of an IT (Larosiliere & Carter, 2016). This chapter begins with an insight into the task-technology fit (TTF) theory and an elaborate overview of the FVT. This is followed by a theoretical foundation and detailed discussion of the FVT, justification of the use of the theory for the study, its limitations and finally a summary of the chapter.

3.2. The Theoretical Foundation of the Fit-Viability Theory

3.2.1. The Task-Technology Fit – An Overview

The Task-Technology Fit (TTF) theory is a formal construct which matches features of technology to the requirement of the task. In other words, the ability of IT to support a task (Goodhue & Thompson, 1995). In the broad TTF context, task is defined as an action carried out by individuals to turn inputs to outputs and thereby satisfy their information needs. Task

characteristics are those that a user might use IT to perform. According to TTF theory, IT is more likely to have a positive influence on individual performance if the characteristics of the IT meet the task requirements in the organization. In line with OGD goal, governments' aim is to make data available and accessible for re-use by citizens through an innovative technology (Ubaldi, 2013). The required processes involved and the specified characteristics can therefore, be considered as task characteristics for assessing the fit in the context of OGD.

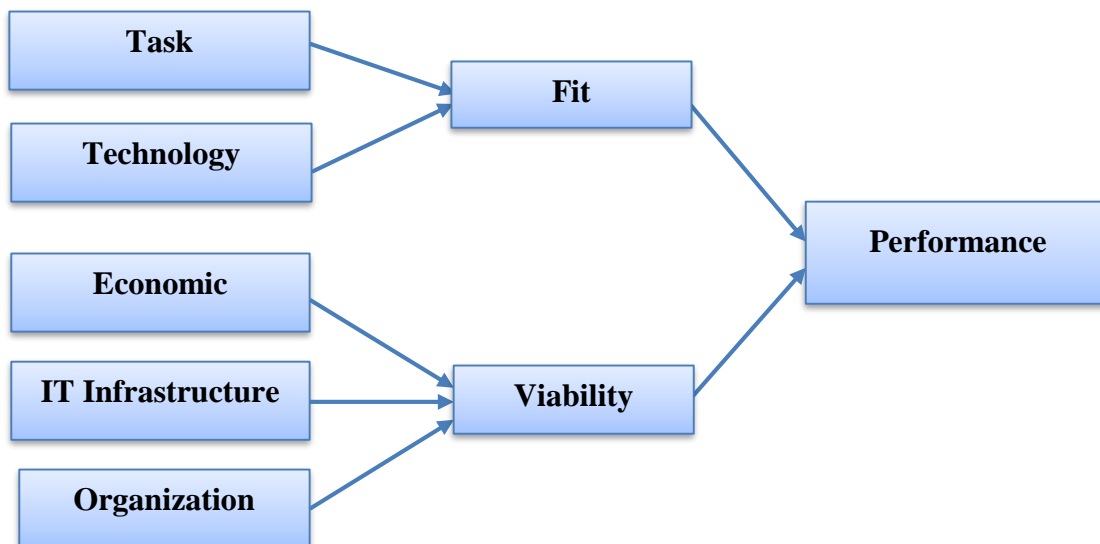
OGD portals have been implemented in many countries including Ghana to promote the right to information and create value for citizens (Jetzek et al., 2016). The government in this instance becomes the main actor (implementer) playing a critical role as a data provider. According to Ubaldi (2013), the role of the implementer is not to only public open datasets, but also to ensure the task characteristics and the associated technology create a user-friendly online portal, meets the data format criteria to foster re-use and make relevant data available through stakeholder consultation need consideration.

3.3. The Fit-Viability Theory

The successes or failures of the implementation of OGD in developing economies can be largely associated with several mitigating factors. Thus, identifying the success and enabling factors of OGD implementation is critical to developing a guideline for assessing the potential of any associated technology (Liang et al., 2007). The framework must address task requirement, technology and the environment in which the technology is implemented. In that regard, a two-dimensional matrix that uses fit and viability to evaluate internet resources can be applied to serve this purpose. Proposed by Tjan (2001), the FVT was originally used to evaluate organizational adoption of Internet resources. The model includes two dimensions. One is *fit* and the other is *viability*. Fit measures the extent to which new network applications

are consistent with the core competence, structure, value and culture of an organization. Viability measures the value-added potential of new network applications, requirements of human resource and financial capabilities. Tjan (2001) proposes four generic strategies based on levels of fit and viability: “invest, redesign, sell/spin out, and kill”. Prior to the proposition of the Fit viability theory, the task-technology fit (TTF) theory by Goodhue & Thompson (1995) was the dominant theory. Later, Liang & Wei (2004) provided the fit-viability framework which merges the theory of task-technology fit (TTF) with the general concept of organizational impact of information technology by adopting the strategic matrix of Tjan (2001). In the revised model, the fit dimension measures the extent to which the feature of a technology matches the needs of the task. The viability on the other hand, refers to the extent to which the infrastructure of the organization is ready for adopting the technology. The FVT as postulated by Tjan (2001) is made up of two-dimensional constructs with its respective variables. The two main independent constructs are fit and viability as represented the Figure 3.1.

Figure 3.1: Fit-Viability Theory



Source: Liang et al. (2007)

3.3.1. Task-Technology Fit Dimension

The task-technology fit dimension assesses how technology matches the task requirements of an entity or organisation (Larosiliere & Carter, 2016). In public organisations, some of the tasks for which technology can impact includes the supply of information, enhanced consultation, and government interaction with citizens in decision making process. To achieve the most out of a technology, a country should be able to establish a degree of convergence between the characteristics of government-related task and technology (Porumbescu, 2016). In view of OGD, the fit dimension of data openness must satisfy two important characteristics: *legally open and technically open* (Dietrich et al., 2012).

Legal dimension of the task characteristics requires that government data shall be considered open if it is made public in a way that complies with the principles of: (1) completeness, (2) Non-discriminatory, (3) Non-proprietary and (4) License-free. For instance, Government data is said to be complete if it is made available to all citizens without subjecting it to any restriction and security (Appiagyei-Atua, 2015). In line with the principles of legal openness, access to government data must be license-free (Ubaldi, 2013). Again, to achieve the objective of legal openness, data available on open government portals must be subjected to the required open data licenses. Open Data license explicitly explain the conditions under which government data may be used (Lee et al., 2014). Examples of OGD licensing include: Creative Commons (CC) License, Open Data Commons Database License (ODbL) and the Open Government License (OGL). The OGL for instance provides the mechanism for public sector data to be made accessible under the same terms with minimal restrictions on the use (Korn & Oppenheim, 2011). Additionally, Ubaldi (2013) indicated that data subject to the principle of openness, government data must be accessed free of charge. This is as a result of the fact that data generated emanate from “taxpayers’ money.” While the author concedes that public data

should be free of charge, she however, noted charges such as copies of data (photocopies, copies on discs) and other cost that are actually incurred in delivering the data to the user may come at a cost to the demander.

On the other hand, technically opened, means data must be published in electronic formats that are machine readable and non-proprietary, for easy access to reuse. Data must also be publicly available and accessible on a public data portal, without password or firewall restrictions. Technically, the open handbook recommends that implementers must ensure these tasks are followed: choice of datasets, making data available and making data discoverable (Gascó-Hernández et al., 2018). Thus, choosing the dataset(s) to make open is the first task in OGDI though the process in many cases may be challenging. That notwithstanding, the whole process of technically opening up data is iterative and the implementing agency can return to this task along the process (Zuiderwijk et al., 2012). Implementing agency must create the list of identifiable public datasets that could be made open to start with. Technically, the suitability of the datasets is relevant to the implementation of the OGDI though there is no requirement for creating a comprehensive list of suitable datasets. However, the main point to bear in mind is whether it is feasible to publish the data. This enforces the need for the implementer to consult data demanders for their preference of datasets. Again, OGD must be Available, preferably on a free download data portal. The data should be available as a complete, discoverable and well cataloged (Kučera et al., 2013). Thus, If the data is published on the portal under statute, the datasets should be available for download in multiple formats and well profiled. Moreover, a web API or similar service may also be very useful, but they are not a substitute for bulk access. Most importantly, data must be available in a machine-readable format. Thus, making sure that datasets allow for greatest re-use and redistribution. For instance, datasets published as PDF (Portable Document Format) and Xlsx documents, often

used for high quality printing. While these datasets can be read by humans, they are very hard for a computer to use. This greatly limits the usability of datasets. Other non-proprietary formats such as CSV, JSON and GeoJSON must be given more attention for larger interoperability of OGD. Further, it is better to give out raw data now than perfect data in six months' time. This explains the currentness of data for publication on the data portal (Krishnamurthy & Awazu, 2016).

To provide truly and legally and technically open data, there must be the right to reuse government data without any restrictions such as registration requirements, access fees and usage limitations, among others (Dietrich et al., 2012). Whether these legal or technical restrictions have been specifically put in place or are the accidental result of the choice of data format or software (i.e., usage limits or copyright restrictions), it is appropriate for OGD implementers to address and remove these legal barriers to access. The aim should be to provide broader, nondiscriminatory, free access to public data so that any citizens can access at any time without having to provide any justification for doing so (Gascó-Hernández et al., 2018).

While the task characteristics refer to the relevant task required, the technology characteristics refer to the information and communication technology needed for the implementation of OGD (Conradie & Choenni, 2014). Both task and technology characteristics must be satisfied to be able to achieve the objective of OGDI. In the current study, the fit dimension assesses the relevant legal, technical and environmental factors associated with actors in the GODI ecosystem (Implementer, data suppliers and data demanders). The legal task would include the assessment of GODI's implementation in respect of OGD legal requirement such as open government license, Data Protection Act (Act 843), national open government data policy. The

technical dimension would assess the technical requirements of OGD implementation including: technical competencies and publishing standards. Moreover, other environmental task requirements such as stakeholder engagements would also be assessed. All these requirements however, would be explored in line with the Fit dimension of the FVT (Liang et al., 2007).

3.3.2. Viability Dimension

The Viability dimension refers to the country's available resources that affect the progress of OGDI (Larosiliere & Carter, 2016). Viability measures the extent to which the available infrastructure enhances the adopted IT (Liang et al., 2014). These include economic, available IT infrastructure and organisational viability of the organisation.

First, the economic viability assesses the value creation, economic stability, and prosperity of users of the technology in the country. OGD has the ability to create both shared and economic value for both government and business if government open its data for reuse (Fauscette, 2009). Economic value of OGD refers to the creation of resources, inputs, processes or policies combined to generate improvements in the lives of data users. On the other hand, shared value of OGD, applies to the benefits derived by multiple stakeholders including government, businesses and individuals (Fauscette, 2009). Prior research by Jetzek et al. (2016) and Krishnan et al. (2013) have found that the investment into generating quality datasets by OGD implementing agencies can impact on the returns of governments investments and boost economic prospects. Thus, countries stand to gain if OGDI is given the needed attention financially. Again, improvements on existing infrastructure that supports OGD tools and services need attention (Afful-Dadzie & Afful-Dadzie, 2017b).

Second, the organizational factor assesses the country's overall readiness to utilize e-government advanced functions and features. A highly educated country will have the capacity to utilize OGDIs (Nwagwu, 2013). Thus, the structure and the organisational maturity of the implementing agency must also be assessed. Further, the assignment of roles and responsibility for each member within the management body must be done to ensure the sustainability of the initiative (Chatfield & Reddick, 2017).

Third, IT infrastructure viability assesses the country's overall information communication and technology infrastructure. The World Bank OD guide stipulates that OGD implementing countries must first assess the level of available IT infrastructure. Since OGD is IT driven, a country with a higher level of technology development would be able to support future OGD implementations and advancements. Past studies (Krishnan et al., 2017; Larosiliere & Carter, 2016) have found that the maturity of the country's level of technology development positively influenced the maturation of electronic government tools and services. In a recent OGD utilization study, (Afful-Dadzie & Afful-Dadzie, 2017b; Conradie & Choenni, 2014) found that the availability of quality human resources, technological infrastructure, and wealth were all significant factors that positively impacted OGD.

As suggested by Tjan (2001), Fit and viability are two main factors which affected the performance of technology adoption and implementation in organizations. Again, Liang et al. (2014) added that the theory is relevant when a researcher seeks to assess the performance of the implementation and use of technology. In view of the stated reasons, the FVT was relevant

for this study because it provides an understanding of the task-technology and economic viability of the OGDI across the globe.

3.4. Justification for the Choice of Theory for the Study

The Fit Viability Theory was originally developed by Tjan (2001). The theory was an extension of the Task-Technology Fit (TTF) theory by (Goodhue & Thompson, 1995). Liang et al. (2007) later revised the FVT to include fit dimension to measure the need for a task with the adopted technology. The FVT has emerged as the befitting theory for assessing the performance of an implemented technology (Tripathi & Nasina, 2017). The FVT is adopted for this study because its constructs provide an understanding of how to assess the performance of OGDI implementation based on the task-technology requirement and the viability of its economic, IT infrastructure and organizational readiness. Studies on OGD implementation have argued that government has to provide technical resources through best practices and the provision of the appropriate regulatory and legal regulations (Geginat & Saltane, 2016; Zuiderwijk & Janssen, 2014). Vicente & Novo (2014) mentioned that the FVT is useful for examining the technology fit and its consequential value in relation to its implementation and performance taking into accounts the environmental factors. Meanwhile, the FVT helps to investigate the technical and organizational factors that affect the implementation and challenges of OGDI (Zuiderwijk et al., 2012).

Tjan (2001) further explains that the FVT is relevant when a researcher seeks to explain how interactions and stakeholder participation are applied by the components of task characteristics which comprises of the legal and regulations, and the established process of participation for the purpose of creating value (Ubaldi, 2013). Though it is argued that organizational readiness

is not the only contributory factor (Zhu, 2017), several dependent factors determine its readiness which is linked to its resource availability and technical competencies (Yang & Wu, 2016). Indeed, the organizational structure constitutes myths that are sound, regulations, knowledge acquired through professionalism, education, IT infrastructure and technical skills (Tjan, 2001). Do data suppliers also have the technical competencies to process their data to meet the essentials of open data criteria? The technical competencies of all stakeholders (data suppliers and data users) besides the implementing body, need continuing assessment (Ibrahim et al., 2016). Tripathi & Nasina, (2017) emphasized the need for researches on the use of technology and information systems to adopt the FVT for appropriate performance appraisal. Additionally, the FVT help IS/IT researchers to understanding of complexities of value creation of the adopted technology (Zhu, 2017).

The FVT has been adopted in a number of researches and has aided in empirically examining the task-technology fit and viability of IT. Again, it also aide in establishing existing relationship between government decision to implement OGD and its accompanied innovations that are technologically based. This informed the choice of the FVT as an appropriate framework for this study. To operationalize this theory, each component of fit and viability would serve as exploratory guidelines for the study to assess factors affecting the implementation GODI.

3.5. Limitations of the Fit-Viability Theory

Although the FVT has been recognized to be essential for the study of factors affecting the performance of information systems and innovations (Liang et al., 2007), it is not devoid of some limitations. The use of the FVT in appraisal-oriented studies poses both theoretical and

methodological challenges. The theory has been employed in this study because there is a need for IS researchers to adopt it in prime areas such as studies on digital economy (Haftu, 2018). Again, the theory is dominated by studies in organizational actor models although there is the need to consider the empirical and theoretical shortcomings of the theory in situations where the factors can be misleading (Ansari, Shahzad, Fiss & Zajac, 2010). In the current study for instance, limitations of the FVT in line with literature review was identified. For instance, the inability of the theory to explain the processes involved in the identification of the need assessment of the projects through a multi-stakeholder approach (Hollingsworth, 2015). Chatfield & Reddick (2017) also noted that the role of civil society and inter-agency interactions, specifically the public agencies as key actors at different levels have been neglected by FVT. Most recent studies have regarded the FVT as a stopgap measure for assessing organizational readiness for the adoption of technology (Larosiliere & Carter, 2016). Moreover, despite confronting similar environmental pressures, organizations may respond differently, leading to different outcomes of the proposed changes (Vicente & Novo, 2014). As a result, many of such agencies are increasingly perceived as not fit for purpose rather than change agents (Sharon, Dawes & Helbig, 2010).

However, despite these limitations, the study employs the FVT because it has been rarely used in studies on the OGD. As an evolving innovation, the mitigating institutional environment which may affect its appraisal needs to be explored. This would help curb challenges that may arise in relation to social interaction with digitized systems. The FVT is relevant to explain how the fit dimension measures the extent to which the feature of a technology matches the needs of the task. While viability assesses the extent to which the infrastructure of the organization is ready for the implementing technology with emphasis on the general economic

feasibility, technical infrastructure, the social and political readiness of the citizens, government and implementing agency.

3.6. Chapter Summary

The chapter started with a discussion of the selected framework for the FVT. From this theory, a conceptual model of the study was adopted for the study. It should, however, be noted that the FVT was selected from a lot of IS theory models since it fit for the purpose of the study. Also, this model considered individual organizational factors instead of only government readiness. The chapter also showed empirical evidence of the extent to which the FVT has been used in prominent studies. Moreover, specific context analysis was reviewed under each classification of the two-dimensions (fit and viability) with the view of satisfying the research questions set out at the beginning of the study: what is the level of performance of the Ghana open data initiative over the period? In conclusion, the use of fit-viability dimension is also influenced by the level of technology fit requirement of open data initiatives.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1. Chapter Overview

The preceding chapter discussed the literature on FVT to ascertain its relevance as the choice of theoretical foundation for this study. This chapter presents the methodology for the study. It discusses the research paradigm, research design, data collection and analysis methods to be used.

4.2. Research Paradigm

In research, philosophical assumptions are based on the researcher's view or perception or reality (Mack, 2010; Turyasingura, 2011). Paradigm according to Kuhn (1970), is a "set of beliefs, values and techniques which is shared by members of a scientific community, and which acts as a guide or map, dictating the kinds of problems scientists should address and the types of explanations that are acceptable to them" (p. 15). Again, Neuman & Robson (2004) defined paradigms as "an integrated set of assumptions, beliefs, models of doing good and techniques for gathering and analyzing data". The philosophical assumptions are included in both scientific and social researches to shape the process. Generally, research paradigms consist of the following components: *Ontology, Epistemology and Methodology* (Lincoln, Lynham, & Guba, 2011). Ontology is the study of being (Crotty, 1998). Ontological assumptions are concerned with what constitutes reality, in other words, "*what is.*" Researchers need to take a philosophical position regarding their perceptions of how things really are and how things really work. On the other hand, epistemology is concerned with the nature and forms of knowledge (Cohen et al., 2007). Additionally, epistemological assumptions are concerned with how knowledge can be created, acquired and communicated, in other words,

what it means to know. Guba & Lincoln (2011) explain that epistemology asks the question, what is the nature of the relationship between the would-be knower and what can be known? That notwithstanding, epistemology is intimately related to ontology and methodology; as ontology involves the philosophy of reality and the view of how one perceives reality (Wahyuni, 2012) whether it is external or a construct of our mind (Jonker & Pennink, 2010). Methodology meanwhile identifies the particular practices used to attain knowledge of the reality (Wahyuni, 2012) that is, qualitative, quantitative or mixed methods. Every paradigm is based upon its own ontological and epistemological assumptions. Since all assumptions are conjecture, the philosophical underpinnings of each paradigm can never be empirically proven or disproven. Different paradigms inherently contain differing ontological and epistemological views; therefore, they have differing assumptions of reality and knowledge which underpin their particular research approach.

However, Myer & Avison (2002) discussed three major research paradigms namely: *positivist, interpretive and critical realist*. While the interpretivists are of the view that there are multiple realities Fisher (2010), the positivists hold a contrary view. In their view, positivism assumes there is a single concrete reality (Myers & Avison, 2002). Positivists go forth into the world impartially, discovering absolute knowledge about an objective reality. Thus, the researcher and the researched are independent entities. For instance, entities solely reside in objects, not in the conscience of the researcher, and it is the aim of the researcher to obtain this meaning. The critical realists, on the other hand, are of the view that there is elasticity in perception Fisher (2010), and that there are differences between reality and people's perception of reality (Bisman, 2002). The critical realist's goal is to unearth the observable and non-observable structures which are independent of the events they generate. According to Mingers (2004), critical realism aids an IS researcher to "get beneath the surface to understand and explain why

things are as they are, to hypothesize the structures and mechanisms that shape observable events”. Critical epistemology is an example of subjectivism which is based on real world phenomena and linked with societal ideology. For instance, Cohen et al. (2009) explained that “what counts as knowledge is determined by the social and positional power of the advocates of that knowledge.” The associated methodologies of critical realism research offer the researcher the opportunity to examine challenging phenomena of organisations in a holistic manner by providing more detailed causal explanations of the phenomena (Wynn & Williams, 2012).

Furthermore, critical realist research assumes that social reality is constituted and constructed by people and that despite the deliberate effort to change their social and economic circumstances, they are normally limited by social, cultural and political powers (Vicente & Novo, 2014). For instance, the implementation of GODI almost a decade now has been redundant largely due to organisation and technical challenges. These challenges however, can be associated with several social and political factors (Fan & Zhao, 2017). Since the study is aimed at exploring OGD by employing a fit viability analysis to assess the performance of the GODI, the critical realist paradigm was deemed appropriate for the study. Thus, the purpose of the critical realist is not to predict but to explain OGD through examining patterns of association and possible assessment of the GODI. Again, it is aimed at seeking insight into key participants in the GODI ecosystem rather than drawing on generalization based on statistical significance (Mingers, 2004). Thus far, in relation to the underpinning research purpose and objectives, the choice of the critical realism in this study will provide deeper understanding of GODI and assessment of its implementation since 2012.

4.3. Research Methodology

Research methodology can be defined as varying formats or methods employed in research (Crotty, 1998). Myers (1997) postulated three broadly used research methods as quantitative, qualitative and mixed methods. The quantitative approach is a highly structured research methodology that is used for testing objective theories by examining how variables of the phenomenon relate with one another (Creswell, 2013). It is normally used to answer questions about relationships among measured variables with the purpose of explaining, predicting and controlling phenomenon (Creswell, 2012). For instance, quantitative approach is suitable for studies where variables are clearly defined and the phenomenon, which could be very complex, can be broken down and quantified (Chen, 2011).

On the other hand, qualitative approach is a set of techniques designed with the aim of enabling researchers to obtain an understanding of the immediate socio-cultural surroundings within which people live (Myers, 1997). The qualitative approach is appropriate for exploring and understanding the meanings that individuals or groups give to phenomena as well as obtain details such as thoughts, feelings, processes, and emotions that participants of a research associate with a phenomenon which otherwise may be difficult to obtain by the other research methodologies (Creswell, 2012). Qualitative research for instance, is “typically used to answer questions about the complex nature of phenomena, often with the purpose of describing and understanding the phenomena from the participants’ point of view” (Leedy & Ormrod, 2010).

In view of the these, the study adopted the qualitative approach to investigate the technology underpinning OGD in Ghana and also understand how the task and technology, and economic, IT infrastructure and organisational factors shape the use of this innovation. The choice of a

qualitative approach was as a result of its ability to provide insight and gain answers to the “how” and “why” questions about phenomena that the researcher can either have control of or no control (Walsham, 2006). In addition, qualitative research encourages the investigation of a present-day phenomenon that is set within the context of real life and when the existing boundaries between them are not clearly stated (Orlikowski & Baroudi, 1991). From the critical realist view on qualitative research, researchers seek to unearth the foundations underlying realities of individual organisational phenomenon (Boateng, 2016). These factors influenced the choice of the qualitative approach to this study.

4.4. Research Strategy

The study adopted the qualitative approach and hence it is clear that a qualitative research strategy needed to be adopted. Research strategies in qualitative research include case study, phenomenology, ethnography and grounded theory. Phenomenology is a method used to uncover and understand “the constructs that people use in everyday life to make sense of their world” (Ritchie et al., 2013). Ethnography meanwhile, seeks to understand the social world of the people being studied by allowing the researcher to live in their community in order to produce a detailed description of the people, their culture and beliefs (Ritchie et al., 2013). Grounded theory provides the researcher with the opportunity to theorize from evidence that exists in data (Andrade, 2009).

Qualitative case study strategy on the other hand, is used to study complex data on phenomena gathered from varied sources to support the case (Baxter & Jack, 2008). For instance, the socio-cultural phenomena regarding a case can be studied to illuminate subjective realities. Case studies could also involve single or multiple cases. A single case study is suitable when the researcher wants to understand a unique case, whereas the multiple case studies allow the

researcher to understand the differences and similarities between cases as well as replicating findings across cases and to investigate a particular phenomenon in diverse settings (Yin, 2003). According to Yin (2003), the case study is a suitable method when the study seeks to answer “why” and “how” questions that the researcher has little or no control over.

The study adopted the critical realist case study research which involves critical reflections on current practices, assumptions and questions taken for granted and it critiques phenomena based on the theories of one or more critical theorists (Lee, 1989). Given the critical realist perspective of this study, the goal is to assess the fit-viability of GODI and examine the performance of the GODI over the periods of its implementation. The critical case study involving a single case was considered more appropriate for this study.

4.4.1. Choice of Case Study for the Research

This study analyses the performance of the OGD I with a focus on the task-technology fit and viability of the GODI. A case study research, is a preferred strategy to study when —how or —why questions are being posed, when the investigator has little or no control over events and when the focus is a contemporary phenomenon within a real-life context employing multiple methods of data collection to gather information from one or a few entities (people, groups, or organizations) (Yins, 2009). There is therefore, a strong case for the use of an exploratory case study method since this supports the objective set out for this research. The focus of this study was to explore the fit-viability of GODI.

4.4.2. Selecting the Case for the Study

The selection of an organization for research would require site selection based on the characteristics of the phenomena (Benbasat et al., 1987). This therefore, requires that only

current and topical issues are discussed. After the implementation of the Ghana Open Data Initiative (GODI), several questions have been asked regarding; the technical requirement and the viability of the initiative. Arguably, answers to these questions have not emerged yet. Hence, the selection of the GODI for the study would have global significance and can help provide meaningful answers to the research questions.

4.5. Sample Approach

Sampling is that part of statistical practice which is concerned with the selection of an unbiased or random subset of individual observations within a population of individuals. It is intended to yield some knowledge about the population of concern, especially for the purposes of making predictions based on the sample frame (Creswell, 2009). A sample is a small part of something intended as the representative of a whole. According to Creswell (2009), “sampling is that part of statistical practice concerned with the selection of an unbiased or random subset of individual observations within a population of individuals intended to yield some knowledge about the population of concern, especially for the purposes of making predictions based on the sample frame”. The study employed purposive sampling as propounded by Creswell (1994) as its sampling design. This technique is adopted based on confidentiality and anonymity of all the actors within the GODI ecosystem to be able to investigate to gain in-depth information. Again, to ensure adequate representation of all actors in the open government data ecosystem (Implementing agency, Data Suppliers and Key Data users). The study further selected two from each of the three actors. The selection of these actors was based on their level of engagement in the implementation of the GODI.

4.6. Data Collection Techniques

Qualitative researchers can gather data from sources including interviews, discussions, documents and observations (Walsham, 2006). Data collection is not simply gathering data for later analysis, but it is also tied to the research questions and perspective of the study (Chism et al., 2010). As a result, data for the research was collected from multiple sources including informal discussions, observations and semi-structured interviews. In line with critical realist perspective, these multiple sources of data would augment the triangulation of participants' perspectives and also provide a rigorous approach for collecting and analysing data. For the data generators, the study selected agencies who have sent their data for publications on the GODI portal. Again, key data users such as Software development firms who have had some level of engagement with NITA with respect to GODI implementation were also selected.

4.6.1. Interviews

The study made use of interviews both structured and semi-structured questions as a major source of data collection. A semi-structured interview guide is designed based on the research purpose, research questions and propositions developed from the study to conduct the interviews in order to identify the various concepts and themes related to the study (Boateng, 2016). This process was reviewed three times with the guidance of the researcher's supervisors making sure the right questions were asked (see Appendix A). Additionally, a pilot interview was conducted with one of the GODI actors to determine the validity of the questions. This led to the development of a suitable interview guide. The interview guided the interviewer to ask only questions that span from the constructs of the FVT used and also aided in examining other artifacts and documents. Guided by the FVT construct and relevant literature on OGD studies, the interview questions were structure under sessions such as legal, technical and environmental requirements (Janssen et al., 2012; Dietrich et al., 2012; Kučera et al., 2013),

value proposition, management and government structure (Ahmadi Zeleti et al., 2016; Fauscette, 2009; Gasco-hernandez & Gil-garcia, 2018), challenges and achievements (Xiao et al., 2012; Janssen et al., 2012) of the GODI. Additionally, the background of the data interviewees, global OGD and specific GODI objectives were also asked. Face-to-face interviews were mostly conducted with key participants who are involved in the implementation initiative (Boateng, 2016).

The first interview was with NITA where two managers of the GODI were interviewed. NITA is the implementing body responsible for building and managing the GODI web portal. Before then, the researcher had carried out an audit and cursory analysis of the existing GODI portal. This afforded the researcher the opportunity to ascertain whether the development process of portal and its content was in line with international OGD best practices. The researcher interviews one management person and another technical officer. This strategy was to unearth more information relating to administrative and technical. Besides, other supporting documents relating to the implementation of the initiative were also reviewed to ensure literal replication, thus, whether the document information considerably confirmed information earlier collected through the interview. Responses from interviewees were largely audio-recorded and alongside taking notes. Moreover, follow-up questions which initially were not stated in the interview guide but arose were also captured. Each interview, including both formal and informal last between 45 and 90 minutes.

Additionally, four other actors; two from the data generating agencies and key data users were interviewed. The researcher interviewed two public sector officers who were responsible for collecting and generating data in their respective agency. Again, two key software developers

were also interviewed. The objective was to find out their level of involvement, competencies and understanding of the initiative.

4.6.2. Documents and Archival Records

In order to achieve data triangulation, multiple methods including the use of documents and archival records to confirm the findings or data obtained from the interviews were used. The archival records of data used were organisational chart, reports, policy documents and web contents.

Table 4.1: Documents and Archival Records Examined

Document	Purpose
Organisational Chart	To ascertain the organisational structure of GODI
Reports/Policy Documents	To compare current practices with past practices. To assess project's past engagements with other relevant bodies and stakeholders.
Web contents	To assess additional information which was not collected during the field interview. E.g. detailed project information and other services.

Source: Author's Construction

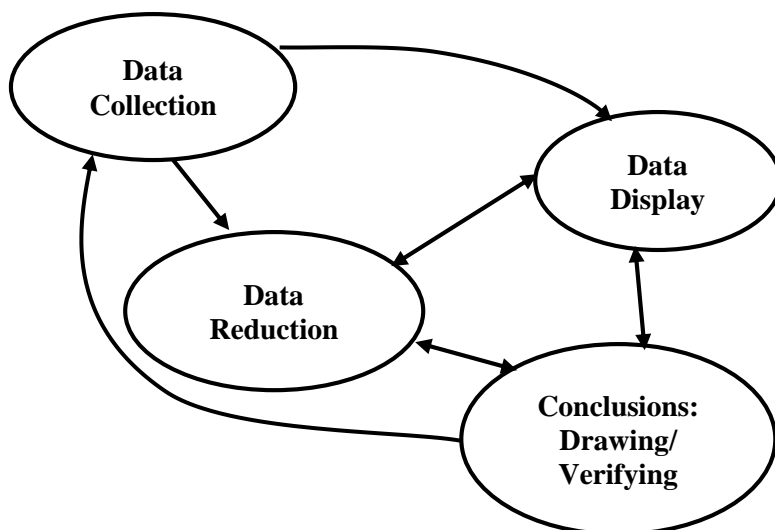
4.6.3. Data Analytical Approach

According to Miles & Huberman (1994), data analysis involves identifying lawful and stable relationships that exist among social phenomena, based on the link of regularities and sequences of these phenomena. Data analysis is a systematic and essentially taxonomic process of sorting and classifying data that has been collected (Green et al., 2007). With reference to the critical realist paradigm adopted for the study which seeks to deconstruct and understand

the structures and mechanisms underlying existing subjective realities, as well as the background of the study, research objectives, research questions and the various constructs of the theoretical foundation, the researcher analysed data collected at different levels. Themes such as task, viability, issues, challenges and resolution of challenges, cost, impact and performance were identified and the data organised according to these themes (Elbana, 2013).

Interviews and field notes that were taken and recorded during data collection were thoroughly analysed to identify emergent concepts and themes. This process aided the researcher to develop a clear connection between and among concepts and themes. Based on the constructs of the FVT and research questions, the identified emerging concepts form the case and these concepts and themes presented diverging views and assessment of the implementation of GODI. Accordingly, this study adopted the Miles and Huberman's (1994) transcendental realism technique which highlights three main components for analysis; data reduction, data display and drawing and verifying conclusions. The figure below shows the three components.

Figure 4.1: Miles and Huberman's Data Analysis Approach



Source: *Miles and Huberman (1994, p.12)*

4.6.4. Data Condensation

Miles and Huberman (2013) refer to data condensation as “the process of selecting, focusing, simplifying, abstracting, and or transforming the data that appear in the full corpus (body) of written-up field notes, interview transcripts, documents and other empirical materials”. Further, Boateng (2018) emphasizes data condensation begins when the research is at its initial phase and runs through the whole process of analysis. This process was characterized by two different stages namely early coding and memoing. In the early stage of data condensation, the researcher summarized the collected data so that the essence of the interview was rather presented and not the actual words from the interview or the discussion.

Coding followed after summarizing the collected data. Accordingly, data was categorized into meaningful sections and labels were assigned to each segment as well as combining codes into themes after descriptive codes as proposed by Miles and Huberman (2013). The descriptive codes were revised and re-categorized into sub-codes as more data from the field study was being analyzed. Finally, memos were created, thus, the ideas generated from the codes in the data were theorised to establish relationships among the codes. According to Boateng (2018), a memo is created when “data (a sentence, paragraph or few pages) finds links with theory and previous literature discussion”.

4.6.5. Data Display

As asserted by Miles and Huberman (2013) a “display is an organised, compressed assembly of information that allows conclusion drawing”. The data obtained were organized into tables, figures and diagrams to establish insights about the data. The summarised data aided in establishing themes and issues for future analysis (Boateng, 2018).

4.6.6. Conclusion Drawing and Verification

As contended by Miles and Huberman (2013), reducing and demonstrating data aid in drawing conclusions from the data. During the data condensation stage, early conclusions were identified, however, these conclusions had to be verified through pattern-matching of noted themes and checking for representativeness of the identified patterns among others. Conclusions were finally presented in the form of findings.

4.7. Ethical Considerations

Ethics was observed in the conduct of this study. Ethics are the codes and standards that the researcher must ensure in the course of the research (Fisher, 2010). Essentially, this protects research participants from any harm that may arise (Creswell, 2009). In this regard, an introductory letter was acquired from the Department of Operations and Management Information Systems to seek permission from the Head of the Department before the commencement of data collection. Secondly, the interview guide adopted for the collecting data clearly stated that participants are assured of their confidentiality and anonymity and that data collected was strictly for academic purposes only. The researcher also sought the consent of participants before recording any interview session while withholding names of participants throughout the study. The researcher also ensures that all these measures were put in place to guarantee the protection of all participants.

4.8. Chapter Summary

This chapter provided detailed information concerning the research method used to answer the research questions posed at the beginning of the study by taking into consideration the research paradigm, research method, sampling technique, data collection and analysis methods of this study. The critical realist paradigm was selected out of the other paradigms such as the

interpretivism and positivism discussed in the chapter. The dogma, principles, standards, and techniques of the critical realist paradigm fit well with the research method and techniques adopted by the researcher. The chapter further discussed the data collection methods adopted for the study and how data was analysed in the study. Ethical concerns that were considered and measures put in place to ensure the protection of participants were discussed in this chapter. The context of this study is therefore discussed in the next chapter which paves way for the analysis of the data gathered using the methodology discussed in this current chapter.

CHAPTER FIVE

CASE DESCRIPTION

5.1. Chapter Overview

The chapter before this one described the methodology for this study. It further presented the selected research paradigm and its influence on the research design and data collection methods. This chapter first presents an overview of Open Government data in Ghana to provide a foundation for the presentation of the case description findings. The chapter also focuses on the Ghana Open Data Initiative as the selected case for the study of its ecosystem and implementation strategy. This chapter seeks to set a foundation for the analysis of data collected on the GODI.

5.2. Open Government Data – An Overview

Earlier sections of the studies have indicated how a number of African countries are gradually opening up their government in pursuit of the commitments made after joining the OGP. Currently, 11 African countries are signatories of the partnership with 9 functioning data portals as indicated in the literature review.

The open government data Barometer report indicated that, as of 2015, Africa was still lagging behind other regions like US, Canada and Australia in the effective implementation of OGDI (Open Data Barometer, 2017). The annual barometer, analyse the performance of the African countries implementing OGDI. Again, the report analyses data quality, data assess and availability, the readiness of African governments to implement open government data practice and the potential to impact positively on the lives of citizens. Among the 115 countries assessed globally, no African country made it up to the top 30. For instance, Kenya was ranked among the top 40 while other seven African countries were in the bottom ten. However, Ghana was

ranked 67 among the 115 countries assessed. While some countries such as Kenya, Ghana, Tanzania, Burkina Faso have also improved, especially in implementation others still lag behind expectation (Open Data Barometer, 2017).

Across the open government platforms in Africa, several datasets are available for users. Below is a list of common datasets found on open government data web portals. These datasets comprise varied records and documents relevant to the principles of opening up governments to their citizens. The datasets include but not limited to parliamentary records, legislation, health, education and agriculture and governments contractual and procurements records and elections results. That notwithstanding, the collection of data in most African countries have been the preserved of the national bureau of statistics and kept in their data repositories limiting accessibility (Davis, 2014). Hence, making access to some of these data very daunting. However, to enhance transparency and spur innovations toward economic growth, African countries need to ensure that data gathering, processing and storage are well coordinated. Thus, enhancing the needed human and technical resource capabilities in the public sector while addressing the challenges (Conradie & Choenni, 2014).

Out of the over 75 participating OGP member countries, about 12 are from Africa. They include South Africa, Ghana, Kenya, Tanzania, Liberia, Nigeria, Sierra Leon, Cote D'Ivoire, Burkina Faso, Tunisia, Cape Verde and Malawi (OGP, 2016). Present, Ghana is one of the handful African countries with National Open data web portal where government agencies are required to make their data available for publication. Again, the data must accessible in a machine-readable form that civil society organisations, the developer community, research bodies, the media, businesses and private citizens could utilize (Ohemeng & Ofosu-Adarkwa, 2015).

5.3. The Case of Ghana Open Government Data Initiative

Before the end of 2011, His Excellency Prof. J.E Mills, the president of the Republic of Ghana at the time, signed Ghana onto the Open Government Partnership (OGP). The OGP is a worldwide Non-Governmental Organisation (NGO) which was set-up by the United States government with the ultimate aim of promoting global openness (OGP, 2016). OGP's intent is to solicit solid and genuine commitment from governments to advance transparency, citizens engagement, economic empowerment, spur innovations and advance technology to reinforce the governance of member countries. Accredited member countries of OGP are mandated to draft and submit an action plan for the execution of the set goals to making government data open for use, re-use and distribution. These commitments in the National Action Plan (NAP) by Member countries are expected to be renewed every two years' subject to an assessment by the global OGP steering committee (OGP, 2016). Ghana over the period has submitted three National Action Plans to the partnership with the recent submission in November 2017. Key among the 8 commitments in the National Action Plan include; Open Contracting and contract monitoring, Anti-corruption and transparency, Beneficial Ownership, Fiscal Transparency and accountability, Extractive sector transparency, Right to Information (RTI), Civic Participation and Accountability (Chatwin & Arku, 2018).

As of 2017, Ghana had made over 20 commitments in its National Action Plan. Notably among the commitments are Technology and innovation, RTI, Open Data and Civic Participation (OGP, 2017). Arguably, Open Data is a key component among all the commitments in the NAP. This is due to the fact that all the commitments made are geared toward making public data open. Thus, citizens can only participate in the governance through the liberation of government data to better inform them of what government is doing. This will ultimately result

in the attainment of the government objectives of being transparent and accountable to its citizens (Najafabadi & Luna-Reyes, 2017).

Pursuant to this, the Ghana Open Data Initiative (GODI) was launched with the primary goal of liberating and making government data open for citizens to use, re-use and distribute through the assistance of an interactive web-portal. GODI was to enhance the effectiveness of the Open Data web portal (data.gov.gh), where data from prime sectors of the economy such as health, education, energy and agriculture, serve varied data users. Recounting a historical background to the initiative, Technical Lead Officer of NITA (implementing body) states:

“I have been part of the journey of open data initiative in the country. The whole process started when Ghana saw the need to open up to the international body and subsequently, the then president John Evans Atta Mills signed on Ghana to be part of the open government partnership. Consequently, Ghana was mandated to open up its data to the public. The whole process of opening up data began in 2012 after Ghana was signed onto the partnership in 2011.”

The National Information Technology Agency (NITA) was tasked to lead the implementation of the initiative alongside the Ghana News Agency (GNA) and the Public Sector Reforms Secretariat (PSRS). Other supporting stakeholders were Ghana Statistical Service, Data Controllers, Research Institutions, Civil Society Organisations (CSOs), Ministries Departments and Agencies (MDAs). Emphasizing on what precipitated the need for Ghana to join the global OGP, the Coordinator of GODI stated that:

“Data is driving the economies of countries across the world and looking at the trend where the world was moving towards and Ghana not excluded, the only way we can achieve our developmental goals is opening our data to the public and the international

market for investment drive. We cannot afford to miss out this opportunity taking into cognizance the aim of making the general public participate in the governance process”

He added that:

“it is for these reasons that I think the President then signed on Ghana to the global Open Government Partnership”

Ghana has since 1992 persistently sought after continued political advancement and democratization. A liberal popularity-based constitution proclaimed in 1992 gives a structure to the general citizenry to subscribe to open government under “The Directive Principles of State Policy.” For this reason, Ghana, in recognizing the importance of information sought to give credence to the right to information in the drafting or enacting of its Bills of Rights to information (Appiagyei-atua, 2015). A situation which empowers citizens to obtain data/information either through their own accord or through legislations, data produced, retrieved, gathered or kept by or belonging to government. Government in this context refers to all Ministries, Departments and Agencies of the state who offer services to the citizenry.

Thus, Ghana's 1992 Constitution contains relevant provisions in recognition of privilege to data/information and additional steps that should be taken to advance the liberation of data/information. That notwithstanding, the Constitution extols the need for citizens to demand probity, accountability and transparency from government in the performance of their constitutionally mandated businesses through honesty and responsibility; and to the rule that "all powers of Government emanate from the Sovereign Will of the People." In spite of these constitutional provisions, access to government data in Ghana is relatively difficult. CSOs and private citizens are championing the passage of the RTI bill into law by the Parliament of Ghana

(Appiagyei-atua, 2015). The bill however, is still under consideration state. Ghana joined the global Open Data Initiative in 2011 with the aim of:

1. Promoting Transparency and Accountability
2. Fighting Corruption
3. Liberating Government Data through unlimited access
4. Citizens' participation and Accountability
5. Championing Technology and Innovation.

The country after signing on to the partnership, anticipated some expectations out of the yet to be implemented project. The Coordinator of GODI states:

“besides the notable objectives of open government data; thus, transparency and accountability, Ghana's expectation was also emanated from the fact that it wants to (1) open-up to the international community and (2) to elicit some feedback from citizens on its services delivered so it can improve on its services to enhance socio-economic development”

Indeed, some of these expectations were achieved by NITA in spite of the teething challenges the project faced. The Technical Officer of NITA asserts:

“Yes, we have achieved so many results even though there have been some ups and down along the line. First of all, before opening up data we faced a lot of challenges. Most of the public sector agencies think having data and putting it up there is enough. They actually do not know how data can be used and the value that can be derived from it until we engaged them one after the other explaining to them what open data is. And actually, explained to them what opening data mean and what we are trying to do. We succeeded in educating the participating agencies the main purpose of opening up data

to help government to speed up its development process which I think was one of the important achievements”

He added that:

“Ghana was one of the first countries alongside US and India to come out with an open data platform. So, we were working alongside US and India so I will say it an achievement and looking at the rest of Africa and Ghana taking a step in opening up its data. Subsequently, we had some other African countries visiting Ghana to learn from us. That alone was a great achievement.”

Apparently, Ghana was among the first African countries to champion opening government data through the initiative. On his part, the Coordinator was excited to say that:

“Several African countries come into the country to understudy our project because of the level of achievements we accomplished. Liberia was in the country, we had Rwanda, Ethiopia, and Sierra Léone also came. Again, we had some engagement with Kenya, Nigeria, and Burkina Faso. They all came to Ghana to learn from our project and they are doing well.”

5.3.1. Structure of GODI

Prior to the implementation of the initiative, an oversight body was set up to see to the implementation of GODI. The Coordinator indicated that:

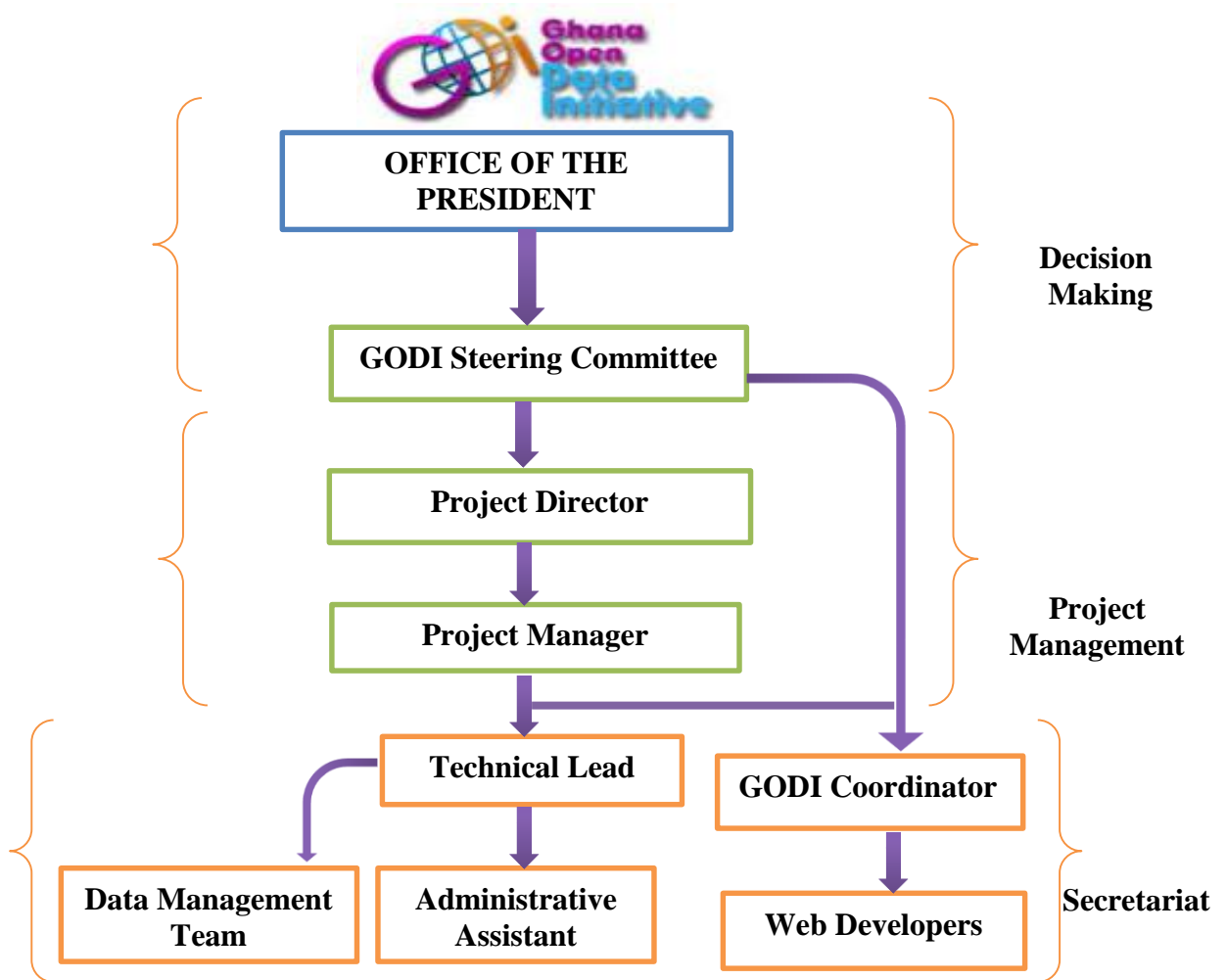
“The initiative was more of innovative and technology-driven and as a result, NITA then chaired by a Data scientist led by the Executive Director of NITA decided that we should go ahead”

The structure of GODI was segmented into three important hierarchies as shown in figure 5.1:

- The Executive Arm (Decision Making)
- The Project Management Team
- The Secretariat

The GODI Steering Committee was set up in August 2012 with the mandate to ensure a smooth implementation of the initiative. The committee was tasked with the responsibility to adhere to the standards and guiding principles of OGP towards the implementation of the initiative. The Executive arm of the committee included a representative of Cabinet (office of the President), Ministry of Communication and other CSOs. The role of the committee was to provide coordinating and facilitating leadership to effect the NAP commitments into concrete and achievable actions. Also, the Office of the Head of the Civil Service Commission is the National OGP coordinator and also chairs the NSC. The Coordinator's position was considered key in the open government data implementation strategy due to the collaborative role with all the MDAs across the country. The steering committee also included representatives each from NITA, CSOs, and Media groups. The Project team was to make sure the project was executed according to plan. The inclusion of a Project management Team was to ensure that key deliverables were achieved on time. Again, the project had a Secretariat, which included the Technical team, the Coordinating and Management staff of the initiative. Figure 5.2 presents the GODI Steering Committee.

Figure 5.1: The GODI's Organogram



Source: GODI (2012)

5.3.2. GODI Ecosystem

GODI had a multi-stakeholder ecosystem for which NITA depends on to be able to achieve the objective of the initiative. The GODI Coordinator asserts:

“Open Government Data initiative is more of a multi-stakeholder venture. You can’t do well without the involvement of all the stakeholders. It is like a chain, once one breaks away from the chain the entire system comes to a halt. We needed the support of all actors to make the process work seamless and for the sake of sustainability.”

As the lead implementing agency, NITA was responsible for coordinating the project implementation including the development of the portal, training, generation and publishing of data, and stakeholder engagement for the smooth implementation of the project. The current GODI ecosystem as shown in figure 5.3, included:

- NITA as the Implementing Agency
- MDAs as Government Data Generators
- The Developer Community as Key Data Users
- Civil Society Organisation also as Key Data User
- Private Citizens as Open Data participants and Users

NITA was the agency task with the responsibility to ensure the technology and innovation commitment of the OGD in the NAP was achieved. The innovation and technology commitments were to build a national open data web platform for citizens to have unlimited access to public data published on the portal. Data would have to be generated by the MDAs for onward quality assurances before publishing on the portal. Hence, the involvement of the MDAs as key in the GODI ecosystem. This process of generating data for publishing would have to emanate from several quarters before it is finally published on the data portal.

Figure 5.2: GODI Ecosystem



Source: Author's construction

5.3.3. GODI's Implementation Strategy

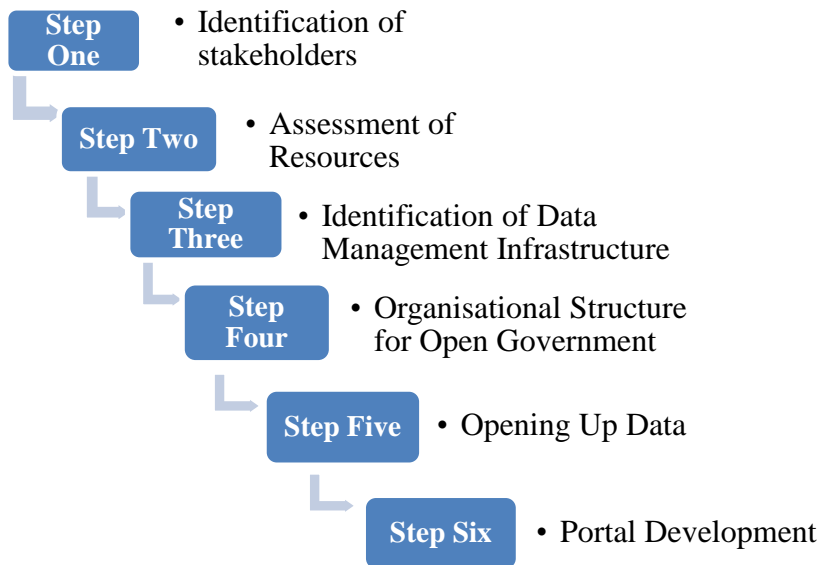
Open Government data is essentially critical to low-and middle-income developing economies like Ghana which largely depend on donor support on the grounds that: Political stability, good governance, transparency and accountability are some of the key fundamentals donor agencies and foreign investors depend on to fund or invest in the country for the socio-economic advancement of citizens (Chatwin & Arku, 2018; Yu & Robinson, 2012). Simple access to government-held information lessens dangers and transaction costs in the financial sector, along these lines diminishing hindrances to the economic development of citizens and the country at large. Citizens participation and investment in government activities have been generally low in developing nations, especially because of the absence of data and technology (Yu & Robinson, 2012).

Liberating government-held data is capable of attracting citizens and organisations to organize themselves into networks whose activities can enhance the socio-economic growth of the country (Afful-Dadzie & Afful-Dadzie, 2017a). Ghana's choice to make government data open was hinged on the fact that Open Government Data (OGD) initiatives far and wide across the globe have shown several advantages. Haven't realized these benefits, Ghana sought to explore the advantages of open government data which is anchored around three principal thematic areas: Transparency and Accountability, Enhanced public services, and Economic development. Along these focal areas, came with several international conferences, seminars and workshops on open data to demystify the concept of open datasets through training, research and development.

5.3.4. Approach to the Implementation of GODI

The following subsections discuss the various approaches that were employed before and during the implementation of the initiative. The section also discusses the various implementation plans adopted during the project. The section also linked the implementation plan to the observations made during the interview session with the various stakeholders of GODI. Figure 5.4 below shows the approach adopted for the implementation of GODI.

Figure 5.3: GODI implementation Approach



Source: Author's Construction

5.3.4.1. Identification of Stakeholders

Stakeholder involvement and input is an inalienable factor in the implementation of every project more especially at the planning stage (Fageha & Aibinu, 2013). Essentially, the motivation behind undertaken stakeholder consultation is to elicit sufficient information that is expected to recognise the tasks to be undertaken towards the end goal to prevent any defect in the execution of the project (Cano & Lidón, 2011). Thus, stakeholder involvement is needed to ascertain whether or not to proceed with the project or not.

Before the beginning of open government activity, it is prudent for government first to recognise every one of the stakeholders in a bid to explain and assign their roles and contribution to the project. Involving stakeholders in an open government initiative in the early stages is important towards successful implementation, more specifically data generators

within the public sector and key data users who are mostly from the diverse field; developers, researchers, CSOs and the media (Dawes et al., 2016; Rossi & Kinnari, 2014).

Before the implementation of GODI, a stakeholder consultation was held to sensitize all stakeholders involved in the project. When asked as to the level of stakeholder sensitization on the implementation of the project, the GODI IT team manager explained that:

“We engaged most of the MDAs especially those in Accra and some civil society groups like Media Foundation for West Africa, the SDGs secretariat, TransGov Ghana and a couple of them. We were trying to do our best. The plan was to engage all MDAs in all regions across the country but that was not possible because of funding. So, we were just concentrating on Accra. The initiative is such that everybody must be involved even the ordinary person on the street must get involved.”

Clearly, the Steering Committee (NSC) which was set up to oversee the project implementation was also under stressed and could not steer the affairs of the project supervision. The NSC, which comprised major stakeholders of the project implementation had challenges meeting because of financial support. Confirming the situation, the Project coordinator stated that:

“We could not coordinate the engagement of the stakeholders all because of several challenges. Most importantly financial assistance. It was our responsibility (NITA) to sensitize all the MDAs and sensitize all other stakeholders, but we could not. In addition, the CSOs who expressed so much interest in the initiative were at a point disappointed because we could not live up to expectation.”

The CSOs apparently were among the front runners of the initiative more so because, among them, those involved in community-related activities needed data from government that could assist them to undertake their activities. Again, those involved in the fight against corruption

and freedom of information saw the coming of GODI as a relieve. On the other hand, the developer most especially mobile Application developers who needed data most were also disappointed at the level of engagement.

5.3.4.2. Assessment of Resources

Prior to implementing an open government initiative, a readiness assessment must be carried out to appraise the existing resources of the country. These resources include but are not limited to physical infrastructure and technical resources. The assessment determines the current level of preparation, condition of existing infrastructure, strengths, weaknesses existing capacities to be able to recognise the shortcomings, assets, competencies and skill-sets required for open government implementation. The assessment report must also likewise clarify the competencies and capacities of all stakeholders most especially, the implementing agency and data generators (Ubaldi, 2013). The World Bank, for instance, developed some criteria for the assessment of governments towards their readiness to implement OGDIs namely:

Table 5.1: Criteria for OGD Assessment

Task Requirement	<ul style="list-style-type: none"> • Leadership and political will • Policy and Legal Framework • Stakeholder Engagement • Demand for Open government by Citizens
Technical Requirement	<ul style="list-style-type: none"> • Capacity building • Technical skills and Competencies • Infrastructural Capabilities
Organisational Requirement	<ul style="list-style-type: none"> • National Institutional structure and tasks • Financial capabilities • Data generated by Government agencies

Source: World Bank OGD Toolkit (2017)

Government of Ghana over the years has adopted several policies strategies geared towards accomplishing accountability, transparency and citizens' involvement in governance. Some

of which include Rights to service and National Good Governance Programmes (RSGGP, 2013), the National Anti-Corruption Plan (2012-2021) and the Ghana ICT for Accelerated Development Policy (Heeks, 2008). In 2010, the Web Foundation (WF) did a feasibility survey on Ghana's readiness to implement OGD. The report indicated the Government of Ghana was ready in terms of political will and physical infrastructure towards making government open to its citizens through the OGD (World Wide Web, 2011, pp. 3-4). Recounting the background to the feasibility assessment conducted by the WF, a GODI Project Coordinator stated that:

“Prior to Ghana signing on to the OGP, Sir Tim Berners-Lee, the founder of World Wide Web Foundation (WF) came to Ghana in 2009 and during his interactions managed to get Ghana as part of the survey that WF was going to do on open data readiness. So, there were three countries one from Eastern Europe one from southern America and one from Africa and Ghana happens to get the African slot”

Apparently, Ghana was among the foremost countries to be assessed by WF to commence OGD across the globe. The Government through the Office of the Vice President, consented to the goal of the OGD and was dedicated to advocating GODI's implementation at the cabinet level. The outcome of the report gave Ghana the opportunity to open its data through the OGP declaration. The GODI coordinator further disclosed that:

“The survey was carried out later so, in 2010 there was a readiness assessment report which gave indications that Ghana could actually do open data initiative. Based on that report we (NITA) engaged the WF to assist as start the initiative. WF was consulting for us but most of the work was done internally at NITA.”

In its appraisal of OGD readiness in the country, the WF inferred that Ghana exhibited a "convincing case regarding Open Government Data readiness" (World Wide Web, 2011, pp. 3-4).

5.3.4.3. Identification of the Data Management Infrastructure

As part of the implementation plan, NITA was to identify relevant public agencies that generate relevant data suitable for publication on the GODI web portal. Defining the data management infrastructure was relevant to successful implementation of GODI. The existing public sector data management structure was beset with several redundancies, incompleteness with several inaccuracies across similar public agencies (Andoh-Baidoo et al., 2012). Ghana has not had a more ICT centered infrastructure purposely for gathering and managing data for use, reuse and distribution. Over the years, the Ghana Statistical Service (GSS) has been the sole government agency responsible for collecting data from all other public agencies mainly for statistical and planning purpose (Statistical Service Law, PNDC Law 135).

As a requirement, a stock of all public sector data that will be accessible under the open government data project should be taken. This stock will identify the challenges in the existing data generating ecosystem within the public sector (Kučera, Chlapek, Kličmek, & Nečaský, 2015). Public agencies are supposed to have data asset register for which the data would be forwarded for onward publication on the web portal. Structures should likewise be set up in all public agencies to enhance their data generating capacities to be able to produce datasets in the appropriate format (Conradie & Choenni, 2014). This however, was not clearly defined in the case of GODI implementation strategy. It was revealed in the interview that because data generators were not adequately involved in the planning stage, they were not well equipped

to be part of the process. GODI management conceded that they could not harness the resource capabilities of the respective agencies due to lack of funds. The Technical Lead Officer opined:

“I must confess we were supposed to assess the data management infrastructure and advice government accordingly. But we could not all due to funding. Our objective was more towards building the portal than a proper assessment of the resource capabilities of the MDAs. In fact, we were complacent along the line because we had the blessing of the President. So, all we need is to get a letter from the office of the President indicating that we need these datasets and we were given. What we did was to invite them anytime we had programs then we use that as an opportunity to enlighten them on the project”

The definition and allocation of data management resources is key to the successful implementation of OGD as indicated by (Krishnamurthy & Awazu, 2016; Ubaldi, 2013). NITA however, due to lack of funding neither had any engagement with the public agencies on the technical requirements of the initiative nor provided them with any infrastructure to work with.

5.3.4.4. Organizational Structure for Open Government

Achieving a successful OGD implementation is dependent on the structure of the implementing body whose activities must be categorically spelt out in accordance with the objective of bringing all data onto one OGD portal (Harrison et al., 2012). Beside the Steering Committee of OGDI, the structure must have an operating body responsible for the daily functional and non-functional activities of the project. The World Bank, for instance, recommends the appointment of a Chief Information officer responsible for the coordination, controlling and monitoring of the project. Among the body must also be a data expert whose role is to canvass

support for stakeholder involvement in all OGD activities. The coordinator will coordinate every activity of the OGDI, including the technical, infrastructural and organisational support. GODI is currently controlled by a 5-member team from NITA with their roles and responsibilities shown in Table 5.2 below.

Table 5.2: GODI 5-Member team and their Responsibilities.

Member	Responsibilities
1. The Acting Director General of NITA	<ul style="list-style-type: none"> • Heads the Implementing Agency (i.e., NITA) • Reports to cabinet on matters arising from the GODI implementation
2. The Coordinator	<ul style="list-style-type: none"> • Responsible for the day to day running of GODI activities • In charge of all administrative duties concerning GODI • Receives reports from supporting agencies • Training of supporting agencies • Represents NITA on OGP Steering Committee
3. Technical Lead	<ul style="list-style-type: none"> • Responsible for portal development • Responsible for ensuring data management and integrity • Organizes technical workshops for data generators and other stakeholders
4. Administrative Officer	<ul style="list-style-type: none"> • Discharged duties assigned by the Coordinator • Receiving and issuing correspondence on behalf of the Project Director and Coordinator
5. Communication	<ul style="list-style-type: none"> • Responsible for educating the citizens on the initiative • Organizes media and press briefing • Organizes community and media outreach programmes

Source: Author's own Construction

The current 5-member team was undertaking these roles as an added responsibility without a permanent secretariat at the Ministry of Communication. Apparently, the management body couldn't execute much of its duties due to inadequate funding.

5.3.4.5. Opening Up Data

Opening up data describe the process of removing all the necessary barriers limiting availability and accessibility to data. The process of opening up data is generally perceived as one of the principle pathways towards the achievement of open government data objectives (Zhu, 2017). In this way, if the objectives expressed above is being depended on as one of the ways to make government open, the critical issue then relies on the means of open government data. Direction in such manner might be found in the Open Data handbook which proposes that some inquiries be make before government data can be opened:

- At what level is the government data being collected?
- Is the manner in which the data collected timely and systematic?
- In what form is the data processed and stored?
- Is the data in open, proprietary and machine-readable format?
- Are there data protection laws restricting public officers from making data available and accessible to citizens?
- What is the level of e-government strategies and activities in the country to support the OGD initiative?

These and other issues were raised during the implementation of GODI's strategy to make sure government braces itself of impending challenge and address them should they occur. Unfortunately, most of these critical issues were not addressed by management before and during the project execution hence the bottlenecks. In order not to lose public interest in GODI, there was the need to address all mitigating back-end issues towards its sustainability. Meanwhile, data emanating from the public sector must maintain the basic criteria of OGD thus, *legally and technically open, discoverable* in a *raw and bulk* formats (Mustapa & Hamid, 2017; Ubaldi, 2013). Data is legally open when it is available to demanders to use or reuse for

both private and commercial activities with no cost under limited restrictions. On the other hand, data is technically open when it is available and accessible in a raw and machine-readable format. Further, data must be discoverable such that it can be easily retrieved on any platform. These criteria ensure data hosted on the open data web portal is subjected to the required benchmarks for data catalogues.

5.3.4.6. Data Portal Development

The next step after opening up government data was the development of the portal. A data portal is an online data repository designed purposely for making data available and accessible to users. Data published on the web portal is normally arranged in a manner on a dashboard providing all the information about the data and its contents for user's discretion (Ubaldi, 2013). Data portals are the visible platforms for OGD initiatives since they provide a single location for making all government-controlled data available and accessible for use and reuse (Kučera et al., 2013). The GODI Technical Lead Officer explains how the development of the portal evolved:

“We consider so many things before coming out with the platform. I remember working with the India open data team we were looking at three aspects of it. The first was the website itself, the second was the data-store where you store the data and do the visualization and all that and the third is the social aspect of it. So, we used the platform until it got to a point when we were getting about 8000 visitors a month. Eventually, the platform crashed and we had to move to the current platform with the necessary resources which could withstand any external attack.”

Apparently, GODI platform had undergone several stages of development prior to its current state. The current platform was built through the support of the American and Indian partners.

Setting up a data portal is today not difficult because governments who wish to do this do not need to develop their portals from scratch as there are several open-source templates. These templates are developed for the purpose of OGD and have been adopted by many countries around the world. This provides complete solutions for the publishing and retrieval of data.

The GODI Coordinator recounted how Ghana was gifted the Open Government Platform (OGPL) by the American and Indian Government.

“The OGPL was initially given to us by the US in collaboration with the Indian government who have been frontrunners in OGD platform development. This was facilitated by the world bank. It wasn’t easy building on the platform because it was full of bugs. But we managed to develop the platform and finally deployed it in 2012.”

Eventually, Ghana’s portal was built from scratch with the help of the OGPL. However, the OGPL was changed to another open source platform; Comprehensive Knowledge Archive Network (CKAN) later in 2013. CKAN is a version of open data catalog used for the development of many open data portals across the globe. For GODI, moving to CKAN was an upgrade of the existing OGPL which according to the coordinator was more robust in the face of the technical challenges they were facing.

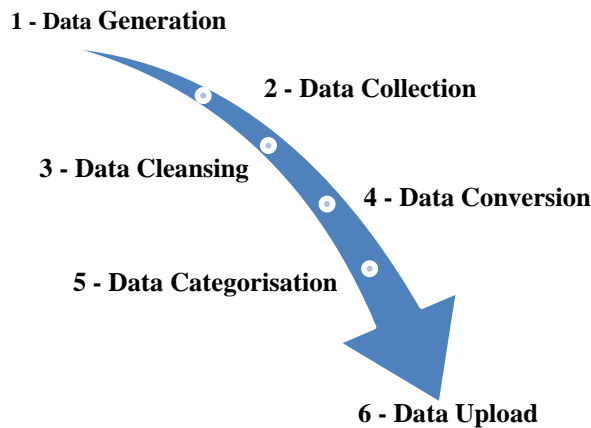
5.3.4.6.1. Activity Flow on how Data is Finally Published on the (GODI) Portal

NITA depends on the data generators in the respective public agencies for the supply of data to be published on the portal. The activity flow on how data is finally published on the portal is shown in Figure 5.5. In the case of GODI, data generation occurs in the course of the MDAs who are the primary repository of government data. Data generation activities are largely

coupled with data gathering, extraction and cleansing (Kassen, 2014). Again, they are also to make sure that data generated are of the required format and quality for easy reusability. However, MDAs were primarily gathering and processing of data for onward transfer to NITA while the process of ensuring that the required data format produce was ignored. Instead, data were generated without any regard for the data itself and its reusability. The Open Data Handbook Kučera et al. (2015) prescribe the mode of data transmission for easy publication. For instance, the integration of Application Programming Interface (API) on data portals for easy transfer of data. In the case of GODI however, NITA staff collect data directly from the respective MDAs on flash drives for onward transmission. Besides, the nature of data usually collected cannot be published directly hence further data cleansing. Moreover, NITA cleans the data and further convert them into the required machine-readable format. Before the data is finally published on the portal, NITA profiles the data and catalog the metadata in line with the W3C standard for publication. The process is summarised in the following steps below.

- Data Generators produce the dataset
- NITA collects data from the agencies
- Clean data to be published
- Convert the data to machine-readable format
- Arrange the data into datasets categories
- Upload the data

Figure 5.4: Activity Flow of how Data is Published on the GODI Portal



Source: Author's construction

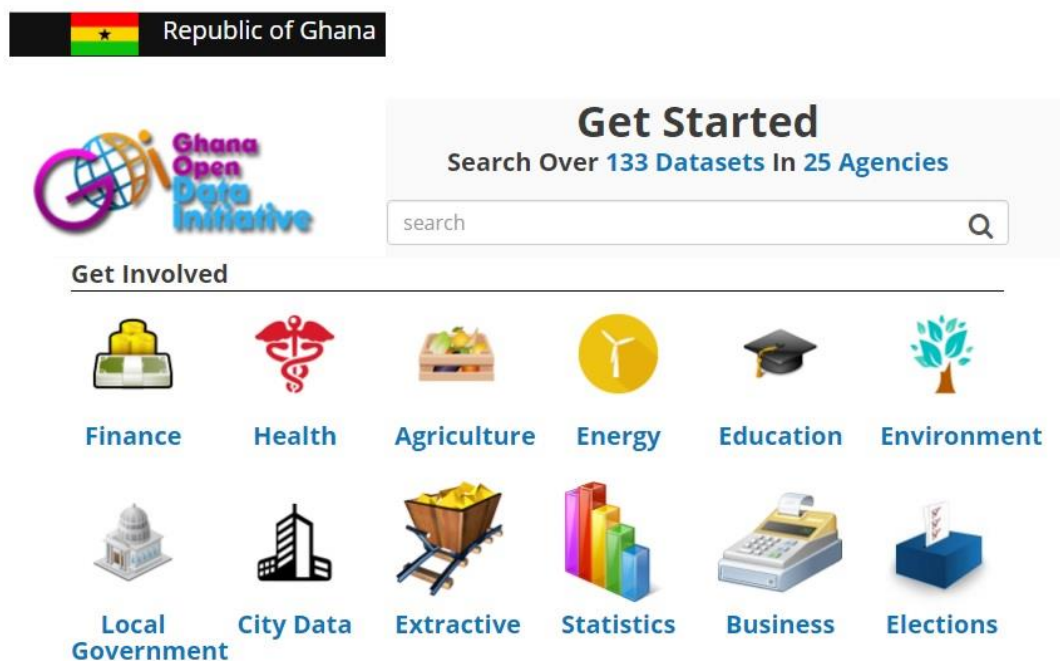
5.3.4.6.2. GODI Data Portal

The GODI data portal www.data.gov.gh/ as of December 2018, contained over 133 data sets that provide information ranging from revenue distribution data to data on the agriculture, economy, energy indicators and electricity generation. The policy objectives that informed the establishment of the portal include “fostering transparency in Government transactions and creating business opportunity for reuse of open government data” (www.data.gov.gh). It is also remarkable that the portal allows for feedback from users. Nonetheless, it has been suggested by the developer community and CSOs that there is a need to make the portal more active in Ghana; the point is crucial of course, as this will empower citizens, who are the mass users of government data to access information on online portals (World Wide Web, 2011, p. 5). Currently, fifteen (15) institutions (as at the time of the research) including Ministries, Departments and Agencies have had their names published on the data portal. They include Ministries of: Agriculture, Local Government, Health and, Agencies such as the electoral commission and the Ghana statistical service.

Besides that, data available on the portal comes from different sectors in varied forms and popular among the datasets include:

- Census data on population, household and employment
- Data on Government expenditure on education
- Data about health facilities across the country
- Immigration data on arrivals into Ghana through entry borders
- Data on average agricultural yield for major crops in Ghana
- Data on agriculture financial and nutrition records

Figure 5.5: Pictorial View of the GODI Data Portal



Source: data.gov.gh/GODI (2018)

Chapter Summary

This chapter presented a description of how GODI was implemented and the purpose for which Ghana commenced the implementation of open government data. The next chapter presents an

analysis of the findings of the study to identify emergent themes and concepts that will be used for discussion in chapter seven.

CHAPTER SIX

RESEARCH FINDINGS

6.1. Chapter Overview

As stated in chapter one, the main purpose of this study is to assess the implementation of OGD in Ghana almost a decade after its implementation. The preceding chapter presented the case findings from the background of the implementation of open government data in Ghana based on the adopted research framework, FVT.

6.2. Findings from Open Government Data in Ghana

The following subsections present findings from the GODI. Its historical antecedent and purpose are also presented. The performance of GODI since its inception benchmarking on its task, technology, environmental, economic, IT infrastructure and organisational requirements, analysed using the fit-viability theory are also presented.

6.2.1. The Task, Technology and Environmental Fit on GODI

This subsection uses the fit viability theory to determine factors which affect the performance of GODI. The factors are explained as task, technology and environmental requirements.

6.2.2. Task Requirement Fit on GODI Implementation

The task requirements of OGD involve all activities that would make “opening up” of data a reality. These tasks are generally undertaken by the implementing agency as a preparatory process prior to the implementation of OGDIs. That notwithstanding, the criteria for defining the openness of a government data is based on two key principles namely; *legal and technical*. GODI’s objective was to make public data open for citizens to use, re-use and redistribute in order to attain the objective of the initiative as stated in the NAP. These objectives;

transparency, accountability and economic development and citizens’ participation in the governance process, can however, be attained through effective participation of citizens in the governance process and feedback from the public. Hence, government data should be open and accessible at all times.

6.2.2.1. Legal Requirements Fit on GODI

This section focuses on some of the open data legal frameworks and other relevant national data protection laws and regulations whose dictates are necessary requirements for the implementation process of GODI. These requirements were: The Open data license, the RTI, Data Protection Act 2012 (Act 843) and the Open Government Data Policy Guidelines as presented in Table 6.1

Table 6.1: Legal Task Requirement Fit on GODI

Legal Task Fit		
Requirement	Characteristics	Impact on GODI
Legal Requirements	Open Data License	<ul style="list-style-type: none"> - The license was to make data legally open to the public for use and share. Subject to which data is placed in the public domain or under liberal terms of use with minimal restrictions. - Thus, without the license, the GODI portal is deemed legally not opened.
	RTI	<ul style="list-style-type: none"> - The objective was to give legal backing to the release of government data to NITA to publish onto the data portal for private citizens to use and re-use. - It was also aimed at eliminating barriers in the acquisition of data from government agencies by NITA for publication on the GODI portal or by private citizens for their use subject to minimal restrictions.
	Data Protection Law (Act 843)	<ul style="list-style-type: none"> - The Act protects data subjects from unnecessary abuse of the use of data belonging to them. - It also protected data published on the portal by NITA from being used for any malicious activity.

Legal Task Fit		
		- Protected the sanctity, security, privacy and integrity of data published on the data portal.
	Open Government Data Policy Guidelines	- Was to give clear guidelines for the implementation of the initiative. - Intended to provide strategic direction towards the attainment on the project goal by the NSC and the GODI coordinating body.

Source: Author's construction

6.2.2.1.1. Open Data License

An important criterium for defining openness of government data is that it should be open for access, use, share and for any purpose subject to at most the requirements that preserve provenance of openness. Thus, Licensing gives legal rights to citizens, businesses, startups and other data users the opportunity to innovate with government open data. The most recognized and used standard licenses, which can be used for data, and datasets are summarised in Table 6.2 below.

Table 6.2: Open Data Licenses and Description

License Type	Accessibility	Description and terms of use
Creative Commons (CC) Licenses	Anyone	CC license is used to provide access to data and other resources on an online platform. The license permits free of charge copying and redistribution of data for use. However, it is in some cases subject to minimal alteration of the original data without having to seek permission from the original rights holder. Specific rights and permissions in this instance have been granted in advance by the rights holder.
Creative Commons (CC) zero	Anyone	CC0 license facilitates the release of content, data, datasets and databases into the public domain (i.e., by the copyright owner waiving all its rights, including the database right and the right to be identified as the creator.
Public Domains and Dedicated License	Anyone	This license is like a public domain dedication. It allows you, as a dataset owner, to use a licensing mechanism to surrender your rights in a dataset when you might not

License Type	Accessibility	Description and terms of use
		otherwise be able to dedicate your dataset to the public domain under applicable law.
Open Data Commons Open Database License (ODbL)	Anyone	Users must attribute any public use of the database, or works produced from the database, in the manner specified in the ODbL. For any use or redistribution of the database, or works produced from it, you must make clear to others the license of the database and keep intact any notices on the original database.
Open Government License (OGL)	Anyone	This License covers a broad range of Information (classed as works in copyright, data, databases and source code, etc.) and so provides the means for data, databases, content, etc., to be licensed under one license – which is useful for content comprising of multiple elements. The OGL provides the mechanism for public sector content to be made accessible under the same terms with minimal restrictions on the user – thus providing the mechanism by which public sector information can reuse, adapted, blended together, etc.
Open Data Common Attribution License	Anyone	This license allows users to share and adapt your dataset so long as they give credit to you. But you must attribute any public use of the database, or works produced from the database, in the manner specified in the ODbL. For any use or redistribution of the database, or works produced from it, you must draw third parties’ attention to the original license of the database and keep intact any notices on the original database.

Source: Korn & Oppenheim (2011)

The current GODI data portal as of the time of this publication, was not moderated by any open data license. Thus, legally, all datasets available on the portal are not “legally open”. This was attributed to the fact that the portal is still within its development phases. The GODI Coordinator concedes:

“Regrettably, we need to make our data open by default. Technically, the current portal is not open due to the fact that it is not open by default. There is open by default chatter that Government of Ghana has to sign. Until then, datasets on the portal remains not legally open.”

The Technical Lead officer added that:

“Whilst building the portal and even during the publishing of data onto the platform the team was working with the guiding principles of open data license in mind though Ghana did not subject its open data initiative to any international open data licensing body for recognition or be part of any open data legal regime.”

Standardizing the legal requirements governing open government data portals datasets was to offer several opportunities to all actors in the GODI ecosystem. Some of these benefits were for greater recognition among users, increased interoperability, and greater ease of compliance in line with international best practices.

6.2.2.1.2. Right To Information (RTI) Law

Access to public data from MDAs was one of the hindrances to the smooth implementation of GODI. The RTI bill which was to give citizens the right to access information from public institutions has over the years not passed into law by the parliament of Ghana. Some public agencies have resisted submitting data to NITA for publication. This was as a result of the fact that no law binds public data generators to comply with the directive to supply data to NITA or any private citizens. The GODI Coordinator asserts:

“it is generally agreed that open data works best when there is RTI. In countries where they have RTI laws passed, open data is easy. So, there are some linkages but, in our case, because it is not passed, we have to make such commitment in the NAP and we have also made some provisions in the drafted National Open data Policy once it is approved by cabinet but until such a time when the RTI is passed by parliament”

The Technical Lead Officer added that:

“One of the setbacks we faced was due to the fact that as a country we do not have any law compelling government to release data to private citizens to use. This affected our work greatly. I must confess even though we had the blessing of the office of the president then, some agencies still resisted given us data to be published”

It was revealed during the interview that the Web Foundation recommended in the 2011 readiness feasibility report that Ghana should take the necessary steps to pass the RTI bill into law. The law according to the report was to facilitate the accessibility of data from government sources.

6.2.2.1.3. Data Protection Laws

Before GODI started, Ghana had not passed the Data protection law. The Data Protection Act 2012 (Act 843) later become Ghana’s main data protection legislation which applies to personal data, i.e., data held or processed that is about a living individual or entity (the data subject) anywhere in the country. It was revealed that the Data protection commission since its establishment has not had any issue with the GODI on an account of breaching any of the statutory regulations in the Act. The Technical Lead officer indicated that:

“We didn’t face any legal challenge because we were working under the instruction of the president more so we were also operating within the open data license. Data protection commission came in late along the line because they were not even in existence when the project started. Along the line, we worked together after the commission was established”

To date, no agency or individual has had any legal tussle with NITA on account of data breaches resulting from its published datasets on the portal. The Technical Lead officer added that;

“We never faced any data integrity issues up until now because the datasets we were publishing belong to government, more so, we were not data producers, we get the data from the right source i.e., from the MDAs. Again, when you look at the metadata you see the name of the institution, the name of the person who released the data, contact details all relevant sources of the information”

The dataset published includes all the relevant information in a catalog clarifying all the attributes such as a data owner, released date, modified date, contact person, data generator and format.

6.2.2.1.4. Open Government Data Policy Guideline

The establishment of a data openness culture within the public sector is relevant to the implementation of OGD. This however, can only be achieved with the adoption of an open data policy guideline. The policy document identifies all stakeholders in the open data ecosystem and defines the role of each actor. Thus, creating a foundation of open government data, and applying the right policy settings from when data is first generated or collected. For this reason, NITA as the sole government ICT implementing arm, has to demands and prioritize OGD Policy. Additionally, the policy document is aimed at assisting MDAs across the country in embedding open government data principles in their operations. The purpose of an open government data Policy is to:

1. Make explicit the Government of Ghana’s commitment to open data,
2. Help agencies in understanding community and industry priorities for open data,
3. Simplify and facilitate the release of data by Government agencies in Ghana,
4. Create a technical and legal framework that enables high value and quality datasets to be released to the public,

5. To define principles of open data to promote open information-based economy,
6. To increase opportunities for this raw data being used creatively to build innovative applications with a positive economic and social benefit to the public.

Ghana is yet to have a completely open government data policy. The policy document is still under its drafting state pending completion and for onward submission to cabinet for approval.

The Coordinator opined that:

“We had a guideline for implementation but not a National Open Data Policy. As part of the E-transform project, we are drafting a policy which is still under development.”

He added that:

“The policy would spell out all guidelines that all data generators should follow so that the end of the day we agree on the standards, format and every technical specification would be addressed for all MDAs to follow.”

Open data policy help facilitate the implementation of best practice on open data principles across the public sector.

The Technical Lead officer asserts:

“the absence of the policy really affected our work. We could not effectively tell who is to do what at what time because there was no blueprint to assigning roles to all those that matter in the project especially in the various MDAs.”

6.2.3.1. Environmental Requirements Fit on GODI

The enactment of open government data initiative needs a broader interaction between the implementing body and its stakeholders. The implementing body needs to better understand the culture of both the internal and external environment whilst taking note of the opportunities and threats they pose to the project performance. GODI’s environment consists of its

stakeholders within its ecosystem. The following subsections discuss GODI’s main stakeholders who are mainly its external actors and whose activities largely fit for purpose but has an impact on the project implementation.

6.2.3.1.1. Stakeholder Engagement

As part of the governance process of open data, stakeholder engagement is key to the sustenance of governments’ open data agenda. Stakeholders represent varied sectors of society. For instance, open government stakeholders include the public sector agencies, private citizens, CSOs, media houses and business including the software developer community. There were some stakeholder engagements before GODI commenced but the engagements weren’t thorough and sustainable due to financial constraints. Table 6.3 summarizes the effect of environmental fit factors on GODI’s implementation.

Table 6.3: Environmental Fit on GODI’s Implementation

Environmental Fit Factors		
Requirement	Characteristics	Impact on GODI
Environmental Factors	Public sector Agencies	<ul style="list-style-type: none"> - They are mainly responsible for the supply of data to NITA - Resulted in the resistance to supply data to NITA - Producing data which are not machine-readable. - Did not have a full complement and understanding of GODI. - The culture of adoption and use of ICT in the public sector.
	CSO Involvement	<ul style="list-style-type: none"> - Aided in the publication of some type of datasets. - Promoted the concept of OGD.
	Developer Community (key Data Users)	<ul style="list-style-type: none"> - Aided in the publication of machine-readable datasets. - Affected the level of data quality on the portal. - Ensured adherence to proper publishing standards.

Source: Author’s Construction

6.2.3.1.2. Public Sector Agencies

In various capacity, the public sector agencies remain an important stakeholder for open government adoption and implementation. The public sector agencies serve in several capacities in the OGD implementation approach undertaking multiple roles in promotion, data producing, users and beneficiaries of the achievements of OGD. There are however, different agencies within the public sector that have crucial responsibilities in an open government and OGD project. The public sector is responsible for the collection and generation of government data. The 2017 NAP states key roles to be undertaken by public sector agencies towards accomplishing the commitments made in the NAP. Currently, only 25 public agencies are listed on the GODI portal. Out of which a few have published datasets from their outfit. Notably, the Ministry of Agriculture (MOFA) has the highest number of datasets published on the GODI web portal. When contacted, a Director of ICT at the MOFA indicated that:

“MOFA has been in the business of open data since 1990 when we had Statistics Research and Information Directorate (SRID) under the head of civil service with the prime duty of ensuring that Agriculture data is available for everyone within the agricultural value chain. They go to the field to gather the data and packaged them so that when people need them, they can be made available to them. Fast forward, we had Ghana joining the OGP with NITA championing the whole initiative through the building of a data portal to augment our efforts of making data more accessible in a meaningful format.”

He added that:

“We have been part of the current GODI since its establishment in 2012. Admittedly, the consultation has not been thorough due to several challenges. As a matter of fact, the project has suffered due to financial constraints and the current World Bank

Support is what has gingered the project again. Moving forward, as a member of the GODI policy committee I can say things will improve. But at the initial state things were rough for which the consultations were not that effective”

On his part, the MIS Manager of the Accra Metropolitan Assembly (AMA) indicated that:

“I was invited to a session in 2018 by NITA on the GODI project. Actually, I was there in my capacity as a staff of the assembly and also a programmer”

He explained that:

“The discussion was short... we were only informed of the project and how we can encourage the assemblies and other data users to leverage on the prospects of the platform to improve on their services through citizens’ feedback and also create opportunities for businesses.”

The AMA however have neither received any request from NITA to submit any data for publication nor sent any data on their own volition for publishing on the data portal. On the contrary, the MOFA ICT Director indicated that:

“We have had a cordial relationship with NITA regarding the project implementation and our objective of making Agric data more open and accessible. So, NITA personnel always come for our data to be published on the portal. Sometimes we give them more than what they request including datasets we think it is relevant to the public for utilization. We do this because government data more especially Agric data should be free for all stakeholders. And GODI portal serves as a conduit for people to access our data to me I think it’s an objective fulfilled”

The MOFA had higher expectation when they joined the initiative. The MOFA Director asserts:

“in the past collection and access to data was not that easy as compared to current circumstance where we have several tools and platforms for collecting and dissemination of data. So, we were so excited with the initiative because we believe it will contribute to a larger extent reducing the cost of our operations. For instance, market prices. In the past, we spent so much on getting these data from the markets to the farmers. But now it’s very easy to collect and even disseminate data to all stakeholders in the Agric value chain”

The public sector in Ghana is overwhelmed with several challenges notably the integration of information technologies in the collection and generation of data. The MIS Manager states:

“coordinating, controlling and monitoring data at the Assembly is quite difficult. Our data is scattered everywhere. That is a challenge that we are trying to resolve now. For instance, transport, planning, signage and advertising data are all separated from the central administration and our server can’t communicate with them. So, we are now trying to link all of them so we can share resources from a central location”

He added that:

“I believe such an initiative would push us to put measures in place in the shortest possible time to harmonize our data collection and generation to facilitate the easy access to our data by citizens.”

Open government data contributes to improving the efficiency of public services. Greater efficiency in processes and delivery of public service can only be achieved from cross-institution sharing data, which intern can contribute to the development of innovative serves.

6.2.3.1.3. Civil Society Organisations (CSOs)

A couple of CSOs were engaged in the implementation process. The GODI steering committee has a representative of CSOs in Ghana. CSOs such as Media Foundation for West Africa (MFWA), Ghana Extractive Industries Transparency Initiative (GHEITI), TransGov Ghana and the Sustainable Development Goals (SDG) Secretariat has been part of the initiative since its establishment. Most of these CSOs are involved in activities such as rural community improvement, promoting transparency, anti-corruption campaign, media and human rights. According to the GODI Coordinator:

“It was good to engage the CSOs because they are already in the business of data trying to uproot corruption and point out issues that are not right and so the datasets we published were to serve their intended goal. These groups want to know how much government allocate to every agency and how much is spent on the project. And because some of them are pro-poor oriented, they want to know much of the amount was utilized at the end of the day.”

It was evident that the CSOs were one of the most interested parties in the initiative. The GODI Coordinator added that:

“Because of their keen interest in the open data project, we were moved by their enthusiasms and they actually helped shape the initiative in so many ways. I must confess they are the practical group we worked with. They sometimes push us to go for some types of datasets.”

He continued:

“those CSOs who have links with international organisations needed some of the data sets most for their mother organisations. Agricultural Datasets for instance, were the most sought for by those with links with international agencies like FAO.”

To gain traction to the GODI web portal, NITA ensured that some datasets which are of economic substance were as well published. Though there has been some engagement with the CSOs by NITA it has not been widespread and the result arguably is yet to be felt through the e-transform project. He lamented in the interview that:

“we wanted to have frequent interaction with them but hosting them is all about money and we could not sustain the meetings looking at our limited financial resources.”

6.2.3.1.4. Software Developer Community

A key thematic area among Ghana’s three main OGD agenda was economic growth. The creation of the open data portal was to create employment for application and service developers to spur new innovations and development in the IT sector. The development of mobile applications and other location-based software rely heavily on “local” data to operate such Apps. Since Government tends to be the custodian of most of the datasets used by software developers, there was high expectation of OGD from the developer community. Ghana is home to many Tech companies including; Mobile Web Ghana, Esoko Limited, Meltwater Entrepreneurial School for Technology (MEST), Farmerline, Agrocenta Limited among many. It was evident that most of these Tech companies have limited or no information about GODI and the datasets the platform provides. In an interview with a Project Manager of a software development house he indicated that:

“Our firm has been part of the initiative since 2012. We have been invited to meetings by NITA on the project a couple of times. However, the engagement has not been thorough... I wish we had regular meetings with NITA to let them know the challenges we face accessing and using to the datasets published on the GODI web portal.”

On the contrary, another software development house which has been in operations since 2008 in the country, have not had any engagement with NITA on the project. Among the numerous challenges faced by these firms in respect of access to government data, the most challenging ones are: *the strenuous procedure in accessing government data, the format of the data and the relevance of the data.* The Operations Manager of another software development house lamented on how challenging it is to access government data:

“Besides data available on data portals, access to government data is very difficult. The ministries do not have a specific point of contact to access data and because of that you have to move from one unit to the other to get what you want all because data is scattered among units”

On the contrary the ICT Director of MOFA opined:

“data access in our ministry is largely not stressful. It is believed that access to data in the public sector is hectic but I bet to differ. We have a service charter that guides how data or information can be acquired and it’s not any lengthy bureaucratic process. Just apply to the respective directorate and you will be given. Our ministry has been very accessible to all data users. There has not been a time where we have refused to grant access to any request for data. In fact, they walk in here every day to request for data and we give them out if we have them. In the event when we don’t readily have it, we either give them time to come on a later date or refer them to the appropriate

directorate where they can get them. Our doors are always open. With your flash drive, we can just give the data to you”

These Tech firms bemoaned several challenges in relation to data format available to them in the event they gain access to some government datasets. The software development house Operations Manager again lamented that:

“Data format has always been one of our main challenge to government datasets. It has always been hard copies. We wish we get softcopies of different formats, but mostly never which is really a challenge”

This sentiment was echoed by the Operations Manager of the software development house as:

“For instance, if you need to integrate over 10,000 household datasets into an application, how can you retype all these data one after the other and convert them to the required format just because the data was handed over to you in a hard copy? It is definitely going to be a waste of time and resources to us as a firm. So more often we try to convert and extract them into other machine-readable formats so we can use them in our apps. Its, not the best practice, but we have to cope because we need the datasets for us to stay in business. Getting softcopies from some of the ministries is not easy. It is really tough.”

Datasets published on the portal must be of some relevance to users. These Two tech firms indicated how frustrating it is to acquire datasets and it does not serve the intended purpose.

The Project manager recounts:

“We wanted to build an application for users to have quick access to health facilities across the country. I visited the GODI portal and downloaded some Ghana Health

Service dataset which was geocoded. The dataset describes the physical location of health facilities across the country. After integrating the geodata in the application we realized that some of the coordinates were located on the sea. So, we were alarmed how come such error was committed generating such important dataset”

The involvement of the developer community is to help facilitate the improvement of data format, quality, technical skills and competencies of key stakeholders in the GODI ecosystem. Again, their involvement was to encourage innovative competition among Tech firms and encourage monitoring by civil society of the data demand and supply required by all key data users.

6.2.3.2. Technical Requirements Fit on GODI

The technical requirement fit is an important factor besides the legal and the environmental factors required for the implementation of GODI. The technical requirements for GODI’s implementation comprised the technical competencies of personnel, the portal development, functional requirements, quality of datasets published and training. Table 6.4 summarizes the effect of the technical requirements on GODI’s implementation.

Table 6.4: Technical Requirements Fit on GODI’s Implementation

Technical Requirements Fit		
Requirement	Characteristics	Impact on GODI
Technical Requirement	Technical Competences	- The development of the portal to meet the international standard.
	Publishing Standards	- Follow required guidelines as prescribed in the OGD publishing standards procedures
	Functional Requirements	- The portal not able to perform all the relevant functionalities of a standards open data portal.
	Portal Development and Datasets	- Performance of quality assurance before publishing data on the portal. - Data management and security checks - Availability of varied data format.

Technical Requirements Fit		
	Training	<ul style="list-style-type: none"> - The collection and generation of datasets. - Understanding the concepts of OGD. - Maintenance and administration of the portal.

Source: Author’s own Construction

6.2.3.2.1. Technical Competence

Basic technical skills on open data possessed by NITA personnel prior to the project implementation and development of the portal was limited. The OGD initiative was an emerging concept across Africa and as a result, most public institutions in Ghana had limited understanding of the initiative. The technical staff on the project had to learn on their own through seminars and conferences attended outside Ghana. The GODI Coordinator conceded that:

“In respect of technical staff, I will say we didn’t have any because the initiative was new. As we speak now Ghana was among the few countries with National data portals after five or six years now. So, we got the Web Foundation to guide us and they left after six months. We also attended a few international conferences and that gave us some insights that gave us some competencies. So, we learnt on the job and now in charge of its operation”

On his part, the Technical Lead officer corroborated the assertion made by the GODI Coordinator and indicated that:

“We at NITA had a few technical staff with the requisite technology know-how and competences, but because open data was a pretty new thing we didn’t know much and we had to use that as an opportunity to learn to understand the concept and that was what we did and we have learnt over pretty much over the years.”

It was evident that the data supply agencies across the MDAs did not also have any technical competencies in respect of GODI. MOFA ICT Director laments:

“Admittedly, the GODI is suffering because of three main things. One, the technical requirements, two, the executive buy-in and three funding. Currently for instance, on the technical requirements, most of the MDAs do not have the men to do the job. In fact, in the public sector anyone who can operate a laptop thinks he is IT savvy. So, you have accounts clerks, statistical staff, etc., calling themselves IT guys. But when it comes to the nitty-gritties they are found wanting. Those guys do not know what it entails to generate a more meaningful dataset in the required formats such as CSV, etc. So, it’s a big challenge.”

He added that:

“until we have a crop of tech savvy personnel well vexed in data science and technology, the initiative would suffer. Perhaps the best NITA can do is to constantly train them which also comes with a cost and NITA can’t afford that. So, it’s really a challenge.”

This impacted on the implementation strategy of the project with respect to quality data generation and publishing on the portal.

6.2.3.2.2. Publishing Standards

NITA was to follow the required standards to be able to upload data onto the portal once it was set up. These standards according to the World Wide Web Consortium (W3C) publishing standards must be followed in line with best practices. Some standards were followed in the GODI portal development, however, limited understanding coupled with the exit of the WF team impacted on the publishing standards. The W3C publishing standards for open data

include: making data available in a well-structured raw form on the internet, creating an online data catalog of all datasets and making the data in both human and machine-readable. The GODI web portal though was accessible on the internet, had datasets published in an unstructured format. Datasets were well cataloged as required by the standards. However, though, published datasets were machine-readable, they were only available in limited formats only.

6.2.3.2.3. Functional Requirements

The GODI portal functionalities referred to specific tasks' users can perform on the portal and on the published datasets while using the data portal. An audit was carried out on the portal based on its accessibility, downloadable datasets, exportable datasets, dataset analysis, dataset visualization, link to external sites, social media integration and search functionality. With regards to the functional requirements, the GODI Technical Lead Officer asserts:

“we had almost all the modules on the platform so you could do all your visualizations. On the website, you don't need to take your data somewhere for someone to do the visualization for you. We have done pre-visualization that you can go and see but other data there that you can as well use that data to do your own visualization to understand what the data means and all that.”

It was revealed after further checks that some of these functionalities integrated during the initial stages of the portal development, were not working to perfection. For instance, datasets could not be visualized due to technical challenges. Consequently, some of these malfunction modules were disabled. In addition, the GODI Coordinator explained that:

“for the portal, the only requirement besides the data openness is that it should be either a 3-star or 5-star where you can change the datasets from one to the other...in

the previous portal for instance, we had CSV format which can be changed to other formats and can also be visualized but they were not functioning well.”

Adding, he indicated that:

“Some of these functions were given us some technical challenges because of the platform architecture we were using so they were removed.”

He concluded on that subject that:

“the fact is that there are not strict requirements per se. There are international standards to follow but those stated requirements are not strict functionalities as you stated they are just basics. There are standards to follow but these are not strict requirements that would make the portal non-functional. But for us, our mandate was to get the portal done and working in line with the best practice”

6.2.3.2.4. Web Portal Datasets

Defining the datasets to be published is one technical requirement which cannot be taken for granted. Datasets must be cataloged and published in multiple machine-readable formats for re-use purposes. NITA relied on the public agencies (data suppliers) for government data to be able to upload them on to the portal. As of now, the only visible data format on the platform is CSV. Key data users who by chance have downloaded some datasets from the portal identified several data inconsistencies in the published datasets which can be attributed to the lack of proper data quality assurance on the datasets before publishing.

A Project Manager of a software development house asserts:

“We have had several challenges with the way the datasets are packaged. They don't relate well. Several data inconsistencies for which we complained to NITA on a number of occasions”

The GODI Coordinator confirmed that:

“some developers who downloaded and used our datasets called to complain about the datasets. They critiqued our work on the way the datasets were packaged and sometimes suggest to us what they need with respect to the datasets published and the format.”

Datasets were usually acquired by NITA directly from the agencies in hard copies and in minimal circumstances excel format which is proprietary. The technical team cleans the data before they are published on the portal.

6.2.3.2.5. Training

The GODI implementation plan included training for all actors within its ecosystem most especially, the data generators or suppliers (MDAs). Data generators from the various public agencies were supposed to be given basic training on data extraction, collection and conversion of raw data into a more structured machine-readable format. The GODI Coordinator opined:

“there was no training, all we need was get a letter to them that we need these datasets and we are given. In actual fact, the training could have helped us in the implementation process to the extent that most of the datasets quality issues could have been avoided and that could have also enhanced our work as implementing body”

The GODI Technical Lead Officer added:

“Our inability to give the MDAs some basic training affected the standards all because there were no technical guidelines for the MDAs to follow in the generation of data. So, we realized that the MDAs were producing data and the format is different from what is required. Eventually, if you want to relate some of the datasets from the same agency

for instance, it's very difficult so most times some of us the developers would have to sit down and clean the data before publishing... so these were some of the issues”

Both the MOFA ICT Director and the AMA MIS manager confirm this. NITA in the past did not organize any formal training for them on the technical requirements of the initiative.

To NITA, quality assurance was not their priority. Their only mandate was to publish data supplied to them. Agencies were responsible for performing all relevant quality checks before supplying the datasets for onward publication. The Ghana Statistical Service is the only public institutions so far which has its internal quality assurance system to certify national data before publishing or supplying to other agencies. Quality assurance checks on datasets are key in all public institution because of the uncoordinated nature data is generated across several units within the same agency. Quality checks were to minimize data inconsistencies and duplications of datasets in the public sector. The lack of training for the data generators was attributed to the poor nature of data been generated and supplied to NITA for publishing.

6.2.4. The Economic, IT Infrastructure and Organisational Viability of GODI

The subsections below discuss the viability of GODI's implementation based on the underpinning fit viability theory. The factors as discussed are Economic, IT Infrastructure and Organisational.

6.2.4.1. Economic Viability of GODI

GODI's portal affords citizens through its published datasets, greater opportunities to demand accountability, better services from public agencies and also spur innovations. These opportunities however, could only be optimally harnessed through value generation and value

appropriation. Be that as it may, harnessing the economic, social and shared values of datasets published on the GODI portal was dependent on the action of citizens. GODI's Value proposition which affected the level of participation by citizens is as summarised in Table 6.5.

Table 6.5: Economic Viability effect on GODI's implementation

Economic Viability		
Requirement	Characteristics	Impact on GODI
Economic Viability	Citizens Participation, Data Access and Downloads	<ul style="list-style-type: none"> - The level of sensitization by NITA on the value of the project. - Resulted in the low participation of the citizens. - Portal was not updated with current datasets. - Resulted in lesser feedbacks from citizens. - Suggested datasets format could not be integrated. - Datasets could not meet the desired goal of users.

Source: Author's construction

Findings from the interviews indicated that citizens' participation in the initiative was very low due to the inability of NITA to create awareness on the importance of the project. The plan initially was to whip public interest through a series of seminars and community engagement across the country. However, NITA could not live-up to this task due to financial constraints. The earlier stages of the portal development saw relatively high patronage as explained by the Coordinator that:

“at the peak of the project in 2014, we had over 1,000 datasets published on the portal. At the same period, we were recording averagely about 8,000 hits every month and about 4,000 downloads meaning people were using it.”

According to GODI Technical Lead officer:

“later in 2014, the hits and downloads drastically reduced due to several reasons including our inability to project the initiative in the country.”

Publicity was not the core mandate of the NITA as the implementing agency but as part of the plan, they were to facilitate the process through the NSC to encourage citizens to participate in the governance process through the portal. He added that:

“That was the best we could do because of the challenges. We could not make it visible and a lot of people did not know much about it. The research community for instance, did not know much about the portal. A lot of times people would want data for research and when they accidentally chance on it they become excited that we have all these datasets on the portal. So, to some extent, people’s expectations were fulfilled. Some saw the open data portal as a very good means of finding and using it.”

The portal had attracted some traction in Ghana and outside the country in the initial stages of its development but public interest waned due to the kind of datasets that were available on the portal. The portal had faced these challenges due to the lack of supervision and maintenance. Adding to this, the GODI Coordinator said:

“because we lost the supervision of the WF, some of the datasets we put there had some challenges because of the way they were packaged. Some of the data were incomplete. Some private citizens and the development community for instance, have problem with the way machinery doubles some of the datasets. They kept hammering on it that we need to clean it up and that informed us to do the open data part of the e-transform which is ongoing. Things have not gone on smoothly.... For now, there is nothing serious going on.”

In effect, the kind of datasets published on the portal was the main reason why users thronged there in the initial state. That notwithstanding, NITA was not to determine the value of the datasets generated by the agencies. The GODI Coordinator indicated that:

“Sincerely speaking, we were not the generators of the data and it was not our mandate to determine which data is of value or not. That was not part of our mandate as implementing agency.”

He however explained that:

“We had some engagements with the CSOs and some developers to find out the kind of data they want and make sense. So, we were driven by their understanding of what they considered economically viable. Therefore, whatever data we acquired and published, to us was economically viable to them because they have requested such to be made available to them”

The GODI Coordinator asserts:

“Our mandate was to ensure that government get feedback from citizens and improve on administrative efficiencies notably through three key areas.”

The three key areas according to the Coordinator are:

Economic: Where developers would use the data to create worth.

Governance: Where they were expecting citizens to give feedback on what government is doing for administrative efficiencies.

Transparency and Accountability: For citizens to be involved in the process of governance.

6.2.4.2. Infrastructural Viability of GODI

Government produces large volumes of data daily which require robust and larger data warehouse for storage. The WF’s assessment report had indicated that NITA’s existing physical IT infrastructure was fit to commence implementation. Table 6.6 summarizes NITA’s IT infrastructure and its effect on GODI implementation.

Table 6.6: Summary of Infrastructural Effect of GODI

Infrastructural Viability		
Requirement	Characteristics	Impact on GODI
IT Infrastructural Viability	Resource Maturity	<ul style="list-style-type: none"> - The readiness of the data management infrastructure. - The portal not meeting the OGD standards.
	Resource Allocation	<ul style="list-style-type: none"> - Resulting in the slow implementation of the NAP. - Agencies not resourced to generate and transmit quality datasets.
	E-transform	<ul style="list-style-type: none"> - Transform the existing GODI legal and technical framework through the drafting of a new policy and also upgrading the technical infrastructure.

Source Author’s own Construction

6.2.4.2.1. Resource Maturity

Prior to the implementation of the project, the WF indicated that NITA had the IT infrastructure to commence the initiative. The World Bank OGD Assessment Kit lists the following as the bases for achieving successful implementation; Internet/Mobile Infrastructure, Shared Infrastructure and Service, ICT Skills and Government Presence Online. NITA fortunately, was providing some E-services to public agencies across the country and for which it had some basic shared infrastructure and online presence. These initiatives had improved Internet penetration and ICT skills base in the public sector though relatively low.

NITA did not have any dedicated infrastructure for the purpose of the Open data initiative but leveraged on the existing human and technical infrastructure. Some of the existing IT infrastructures at its disposal included a national data Centre including high performance servers, fibre channel disk storage and backup storage systems, and sufficient power conditioning and availability resources to keep the data center running perpetually, with or without mains power. NITA had also commissioned over 100 telecom towers across the country to facilitate its e-government internet connectivity. The GODI Coordinator indicated that:

“we had no staff nor infrastructure purposely for the initiative, but luckily enough, NITA was providing some virtual services for government agencies. So, we had to leverage on those physical infrastructures and commission some virtual servers. But all these were an in-house initiative”

The GODI Technical Lead Officer further asserts:

“Those days we had NITA coming out with a national data center... so that was a project that was undertaking the e-government project and all other e-services. We were trying to connect all the agencies... trying to lay the network infrastructure and all that basically to make sure that the infrastructure is in place. So, for now, we have some of these infrastructures in place and in use.”

He added that:

“It was all because of funding, actually we wanted newer servers and other network infrastructure, but all because of the funding. But for now, what we have is enough to run the platform.”

An audit of GODI's portal architecture indicate that the current portal runs on the Drupal Open Data content platform (DKAN). The portal was moved to DKAN after it faced some technical challenges later in the year 2013.

The GODI Technical Lead Officer again asserts:

“We had several attacks on the platform but because of the solid infrastructure that we had, we were able to control. The DKAN was more stable than the CKAN. Most of the challenges we faced earlier were because the architecture was weak though we had quite a strong physical infrastructure”

NITA recently engaged a consultant to assess the current portal and its physical infrastructure. The consultant maintains NITA's physical IT infrastructure was still in good condition but needed to be upgraded.

The GODI Coordinator maintains:

“the consultant did an assessment and found our current infrastructure was ok and up to the task. Their only problem was the maintenance because we have had a number of server downtime which was a worry to them and impeding the process so they have recommended that we make provision for newer servers because as the project grows it will be difficult to maintain the current servers so that it doesn't crash.”

The portal however, needed to be maintained as a 3-star based on the current server capabilities.

The Coordinator further indicates:

“for now, the consultant has asked us to maintain it at the 3-star architecture so we can maintain it until such a time when we get newer servers to withstand any external pressure”

The W3C rates OGD portals as 3 or 5-Star based on its architectural features. Based on existing architecture, the WF has advised NITA to maintain the portal scale at 3-Star because it does not have features that befit the status of a 5-Star portal.

6.2.4.2.2. Resource Allocation

Resources in terms of human and technical for the GODI were short of the project requirements. With respect to human resource, GODI did not have dedicated trained staff to manage the initiative. All staff working on the project were auxiliary staff drawn from different departments to complement the human resource capacity of the initiative. The Coordinator asserts:

“We NITA Staff working on the project were driven by a kind of motivation or volunteer work that we were doing.”

The initiative did not also have its own secretariat where it is operated. Though the implementing body had a secretarial arm in charge of administrative and management duties, they did not have a permanent secretariat or physical office location where responsibilities were discharged. It was evident that not many resources have been committed by management in terms of resource allocation to NITA or any of the public agencies responsible for generating data for the sustainability of the project. The Coordinator confirms that:

“Government over the years have not been forthcoming in the allocation of resources to the initiative. NITA has been holding the forth over the years until the e-transform project came in.”

The MOFA ICT Director confirms:

“you know public sector your resource can never be enough. Government hardly appropriate funds for infrastructure. We get some of them through donor support. We

only make do with the little we have. For now, I wish we have new set of IT infrastructure but there are no funds for that purpose. But that would not stop us from working. In fact, by the nature of our work we can't short chain the farmer or the stakeholders with information. Because agriculture data is time bound considering the climatic changes and all that so you can't keep farmers in the dark because of limited resource at least you need to make an effort. So, with the little we have we are making do pending when there will be some support for us from the government or donor agencies."

The AMA MIS Manager also laments:

"Resource allocation is always a challenge. There is always no money though we wish to have more infrastructure to help improve on our services"

6.2.4.2.3. E-transform Project

The Ministry of Communications under the eTransform Project intends to ensure that proper policy guidelines, standards and processes consistent with international best practice are in place and that datasets are properly arranged to make it easy for potential users to access and use. The \$97 million project funded by the World Bank would cut across several areas in the current e-government project. GODI has been allocated an amount of \$1million out of the total amount to revamp the entire project. Narrating how the fund was secured, the GODI Coordinator explained that:

"we had since 2014 been knocking on the doors of the World Bank for funding because this project was about aid transparency. So, we wanted the world bank to support. In 2014 the World Bank was just repacking a project for us, we were just ending the

eGhana project and the eTransform was to follow so the World Bank actually push in some funding for us”

He indicated that:

“the project is supposed to be 16 weeks for which by November it will be completed. The various communities would have been involved, trained all data generators so we are going to see finer datasets on the platform”

The Data generators in the MDAs would be trained on how to transmit data from their location to NITA. The GODI Coordinator again added:

“we are going to resource the MDAs and again connect all of them through APIs such that they would send us the data directly from their location”

He further stated that:

“so, we have people who had worked with WF who are now helping us draft a policy and rebuild the portal. And as part of the eTransform we are doing something on the user side”

To engage all actors in the GODI ecosystem he indicated that:

“we are forming what we call Ghana Open Data Alliance (GODA) so anybody can sign-on have conversation with everybody and the alliance platform would be linked to the portal for which datasets can be requested and suggestions also made through the platform”

The MOFA ICT Director confirms:

“We are currently having a series of engagements with NITA as Open Data Managers and Champions. Other groups like Chief Directors have had their session already and the technical staff within the civil service would have their session soon.”

The GODI Technical Lead Officer opined:

“so, we are going to see a finer and more vibrant portal moving forward with more datasets.”

6.2.4.3. Organisational Viability of GODI

The enhancement of organisational interoperability for OGDI implementation can also be viable when there is executive buy-in. Table 6.7 summarizes the organisational viability effects on GODI’s implementation.

Table 6.7: Organisational Viability of GODI

Organisational Viability of GODI		
Requirement	Characteristics	Impact on GODI
Organisational Viability	Organisational Structure	<ul style="list-style-type: none"> - Resulted in the slow pace of the GODI implementation plan. - No proper monitoring of the progress of work. Leading to delay in the implementation of the NAP.
	Organisational Maturity	<ul style="list-style-type: none"> - Resulted in the lack of understanding of the initiative among some members of the NSC. - Limited resources were committed to the implementation of the initiative.
	Funding	<ul style="list-style-type: none"> - Resulted in NITA not been able to meet the demands of all stakeholders. - Resulted in the low standard of portal development and quality of datasets published.

Source: Arthur’s construction

6.2.4.3.1. GODI Organisational Structure

Achieving a successful OGD implementation is dependent on the structure of the implementing body whose activities must be categorically spelt out in accordance with the objective of bringing data onto one OGD portal. Besides the NSC, GODI is currently controlled by a 5-member team as shown in Table 5.2.

The current 5-member team is undertaking these roles as an added responsibility. The GODI Coordinator laments:

“Regrettably, the initiative started without any administrative structure. What we had was just a representative body, but in actual fact the structure was not well constituted. This was all because of funding issues.”

Apparently, the management body couldn’t execute much of its duties because the project did not receive any budgetary allocation from the government.

Adding, the GODI Technical Lead Officer in his own words asserts:

“We started well but at a point we were suffering because of organisational problems. There were no firm commitments due to the manner in which the GODI management structure. Management could not push for any resource from government for us.”

He again opined that:

“We needed a solid system comprising expert in the area of data science and law to form a more formidable structure to man the initiative. At the moment I may say the initiative is suffering partly because of the organisational structure we have.”

The Coordinator confirmed this:

“the current structure is not solid because the initiative is still in its implementation.

But we are making do with what we have until we get all others involved”

6.2.4.3.2. GODI Organisational Maturity

The maturity level of the organisational structure of GODI was dependent on their readiness, understanding and support for the initiative. Again, their ability to interact with government, staff and citizens at large. Thus, the government and NITA was to provide the necessary services for making GODI sustainable. Who will be responsible for providing the executive direction? Who will pay for all services and product for the project implementation? How should government and MDAs rearrange to acquire and accommodate the required data infrastructure and to what extent? Who will be responsible for the maintenance of the GODI web portal? These issues need to be addressed by the NSC and NITA. The GODI Technical Lead officer asserts:

“Government signed the OGP partnership with all hopes and assurances to building an open government system through this initiative. However, the needed logistics were not made ready for us at NITA to accomplish that task.”

He again laments?

“Quite interesting, we thought all needed logistics would be made available to us to start work. But management did not give us any assurance of government’s readiness and support of the initiative and that was the reason why NITA had to take charge of everything from our limited budgetary allocation.”

The GODI Coordinator added:

“support from government has not been forthcoming. I must say getting executive buy-in from the cabinet level is not easy. That is the reason why the project has been struggling to survive”

In his own words, the GODI Technical Lead Officer asserts:

“getting government support is quite daunting. The commitment of management has always been there but logistics has always been our challenge. But currently, because new management is in charge the commitment was not there until the Africa open data conference was held in Ghana last year (2017) then the ministry started showing some interest. The conference again opened Ghana to the world in terms of open government partnership.”

6.2.4.3.3. Funding

A major challenge of GODI’s implementation among other challenges such as limited infrastructure and lack of human and technical resources was funding. Government over the years have not committed much budgetary allocation specifically for the implementation of the initiative. NITA over the years has resourced the initiative from its own budgetary allocation from the Ministry of Communications. The Technical Lead Officer states:

“We started this whole project without funding from any donor or organisation. It was solely financed by the Government of Ghana through NITA”

He explained that:

“There was no donor support whatsoever it was only NITA that was driving it but was just a kind of motivation or volunteer work that we were doing. I can say much of our challenge in respect of the project is lack of funding and all what we were doing was

voluntary. Though the motivation and the skill are there. Some of the team members have to drop along the line all because there was no incentive for us.”

Adding:

“The WF left six months into the project because funding had dried out and we could not sustain their consultancy charges.”

Technically the project was suffering because of funding. The Technical Lead Officer again state:

“It was all because of funding, actually we wanted to procure more physical and other network infrastructure, but we could not all because of the funding”

Adding, the Coordinator asserts:

“we could not give the data generators the needed training to produce quality datasets for us due to funding”

He explained that:

“NITA was constrained because of its limited budgetary allocation from which it has to finance the project from. It was an uphill task for NITA to support all its projects across the country. For instance, how to add and improve on the existing over 100 telecom towers across the country. NITA was also looking at the maintenance cost, fuel, security, etc., were all cost NITA had to bear. So clearly NITA was constrained financially.”

The initiative according to the Coordinator:

“the project started well until 2013 when funding has dried out. The NSC couldn’t meet, no resource, no motivation. Just some little allowance for the committee members and that one was also not forthcoming”

He added that:

“we could not even inform the general public of this important initiative all because we didn’t have the money for it. So, it is true that most people are not aware of the initiative even the research community which also need much data for their work were not well informed”

Consequently, the Technical Officer explained that:

“it was along the line when we were facing challenges that we approached the World Bank and that was when they came in through the eTransform promising to help the Ghana open data initiative”

In terms of finance currently, the Technical Officer indicated that:

“Through the eTransform there is enough funding to do the necessary training and advocacy”

Concluding on that subject, the Coordinator indicated that:

“once the eTransform project is complete Government is going to be informed and the specific presentation would be presented to cabinet and the open data project would be given some special treatment in its budgetary allocation. So, because, it is very critical in the current ecosystem to have data in a format that is good. Again, we don’t want to spend all this money on the project and it becomes a white elephant. For this reason,

we are working hard towards making sure that the project money allocated through the eTransform is used judiciously for the intended purpose.”

6.3. Chapter Summary

The Chapter discussed the case study. The chapter focused on GODI and discussed the current organisational structure. The chapter also discussed the various actors that make up the GODI ecosystem. The various task-technology fit and economic, IT infrastructure and organisational viability factors that affected the implementation of the project were also discussed. The next chapter focuses on analysis and discussions to understand how task, technology, environmental, economic, IT infrastructure and organisational factors impact on the performance of the GODI.

CHAPTER SEVEN

ANALYSIS AND DISCUSSION OF FINDINGS

7.1. Chapter Overview

This chapter discusses how the Fit-Viability requirements affect the performance of GODI with respect to underlying variables stated in the study. The chapter answered the study questions which was to understand the task, technology and environmental fit requirement affecting the implementation of GODI. Again, factors such as economic, IT infrastructure and organisational viability that influence the performance of the GODI since its inception was also discussed.

7.2. Analysis of Findings

These subsections summarize the findings as espoused in the previous chapter by interrogating the interview data to bring out emerging issues and relevant themes for discussion.

7.2.1. Task, Technology and Environmental Fit on GODI Implementation

The task-technology fit dimension of the fit viability theory explains the basic activities which must match the characteristics of a technology requirement. The various requirements are legal, technical and environmental. From the findings, GODI since its inception has gone through various activities across all actors in its ecosystem. The analysis of each requirement during the project implementation is presented below.

7.2.1.1. Analysis of the Legal Requirements Fit on GODI

This section analyses the legal fit requirements that affect the implementation of GODI per the case findings presented in Table 6.1 of chapter 6. The table summarizes the effects per the legal requirements; open data license, RTI, data protection law and the open data policy guidelines, as variables for determining the overall performance of GODI.

Ghana, after becoming a member of the OGP in 2011 was mandated to submit a biannual NAP. The government over the years have submitted 3 NAPs in which the country made some commitments: some of the commitments include: open data, open contracting, anti-corruption and transparency, RTI, civic participation and accountability and technology and Innovation. Among the many commitments set by the government over the years, open data was one key component that most of the stated commitments relies on to making public data open to citizens for use, re-use and distribution. The open data bit of the commitments gave birth to the GODI.

Among the many activities of the initiative, was the development of Ghana's open data portal where government data was published for citizens to access and use. The portal is the only visible thing one could see in the implementation of the initiative. Prior to the commencement of GODI, the Government of Ghana and the implementing body (NITA) were supposed to certify the needed requirement to make datasets published legally and technically open. Legally, data is not open until is backed by the appropriate legal framework. As of 2012 when the open data portal was launched, Ghana had not adopted any legal framework to back the entire initiative especially in respect of data generation, collection and publishing of datasets on the portal.

In respect of open data license, GODI data portal as at present is not licensed to any of open data licensing regime. Thus, making the GODI web portal legally not open. Licensing gives permission to citizens, businesses, startups and other data users the opportunity to innovate with government open data. The openness of GODI data portal was subject to open data license for citizens to access and use under liberal terms of use with minimal restrictions. again, the open license was to ensure that datasets published on data portals provide legal permission for

data users to access and use the data and stimulates re-use. NITA however, have not secured any open data license for the current portal.

For government data to be open, national laws which promote accessibility and use of government data should be promoted. Ghana currently does not have any law that compels government agencies to release data to private citizens. CSOs and Private Citizens in the country over the years have been fighting for the passage to the RTI law by the parliament of Ghana to no avail (as at the time of the research). The absence of the RTI law creates a barrier to citizens in the acquisition of data and at the same time, demotivating legitimate data demanders access to government data. Ultimately, the resistance to the release of data by public agencies to NITA to be published on the portal has contributed to the slow pace in the publishing of datasets on the portal. Though the two movements (i.e., RTI and OGD) are different, they show important similarities in making GODI data portal accessible to citizens: they both strive for the greater availability of government information, based on arguments for accountability and transparency. An assessment of African countries such as Tanzania and Sierra Leone where RTI laws are passed suggests they are doing well in their OGD. However, until the parliament of Ghana passes the RTI bill into law, GODI would continue to suffer some resistance in its data collection and acquisition of data from some MDAs.

The Data Protection Act 2012 (Act 843) is one of Ghana's main data protection legislation which applies to personal data, i.e., data held or processed that is about a living individual or entity (the data subject) anywhere in the country. The Act established a Data Protection Commission whose mandate is to protect the privacy of the individual and personal data by regulating the processing of personal information and also regulate the process of obtaining, holding, using or disclosing personal information. It was evident that NITA nor any of the

MDAs have faced any legal issues regarding the use of any public data in contravention of the statutory provisions in the Act. Further, findings showed that the Act was enacted after Ghana had signed on to the OGP. The Act however, did not have any retrospective impact on the activities of GODI. Besides, data published on the portal were cataloged indicating the agency that generated the dataset, data format and published date.

Key to the establishment of a culture of data openness within the public sector is the adoption of a working policy document relevant to the implementation of OGD. In this context however, the culture of data openness in the public sector can only be achieved with the adoption of an open data policy guideline. The policy document identifies all relevant stakeholders in the open data ecosystem and defines their roles. NITA, which is the sole government ICT implementing body is tasked with the responsibility to demands and prioritizes government open data agenda. The yet to be adopted Ghana open data policy is aimed at controlling, directing and assisting MDAs across the country in embracing open data principles and culture in their operations. That notwithstanding, analysis of the findings revealed, Ghana, almost a decade into the implementation of a national OGD still have no national open data policy. The policy is still being drafted for onward submission to cabinet for considerations and approval. The policy spells out the role of government in the commitment of resources to NITA and other public agencies. As a result of the absence of the national open data policy, assignment of roles and responsibilities to all stakeholders, data gathering, collection, generation and transmission from the MDAs largely affected the implementation of the initiative. Thus, making the GODI data portal redundant. Table 7.1 summarizes the task fit into low, moderate and high.

Table 7.1: Summary of Legal Task Fit for GODI

Level of Legal Task Requirements Fit for GODI		
Requirement	Characteristics	Fit

		<i>Low</i>	<i>Moderate</i>	<i>High</i>
Legal Requirements	Open Data License			√
	RTI			√
	Data Protection Law			√
	Open Data Policy Guidelines			√

Source: Author's construction

7.2.1.2. Analysis of Environmental Requirements Fit on GODI

The involvement of all stakeholders in the process of GODI implementation was an inevitable task. GODI's environment was largely its major stakeholders in its ecosystem as indicated in table 6.3 in chapter 6 which include the public sector agencies, CSOs and the developer community who are key data users. Evidence from the findings indicated that all the major actors were not effectively engaged before and during the project implementation. The gathering and transmission of datasets for onward publishing onto the portal by NITA largely depend on the availability of data from the public sector agencies. Arguably, the initiative was new to most agencies for which NITA needed to have engaged them thoroughly before commencing the project. Clearly, their involvement in the initiative was low.

The release of data by public sector agencies is central to the success of OGD initiative hence, the need for a deliberate buy-in by all public sector institutions across all levels. Besides, the collection of government data is sparsely dispersed across national, regional and metropolitan, municipal and district levels and their involvement in the process is significant to the success of the GODI project. The data comes in varied forms including: economic (macroeconomic, trade, budgetary, financial); socioeconomic (demographic, income, poverty, housing, education, health, household, transportation, consumption); geographical (geocoding, environmental data and location information – micro and macro). These agencies must be at the forefront of any public sector commitment to open government and OGD so that they can provide the data collection and management support required for these projects.

The use of ICT in the public sector in Ghana has been met with resistance due to some normative and cultural factors such as lack of training and incentive for users. Some data generators in the MDAs were engaged during the project initiation but was limited to only a few in the Greater Accra region. It was revealed from the findings that this engagement was only to inform participants of the initiative and not to engage them in the technicalities involved in the initiative. This suggests consultations between NITA and the MDAs a major stakeholder of the initiative was not thorough. GODI suffered setbacks in respect of datasets acquisition and accessibility due to low consultation with the data generation personnel in the MDAs.

Again, CSOs in Ghana who depend mostly on government data for their operations depended on the portal. CSOs like GHEITI, SDG, MFWA and TransGov Ghana were some of the CSOs that were engaged during the project implementation. The CSOs along the line had influenced the type of datasets published on the portal due to the kind of data they require for their operations. Findings revealed, most of the datasets needed by the CSOs were mostly financial and agricultural from the Ghana statistical service and the Ministry of Agriculture respectively. Further, the engagement had not been widespread for which a larger number of CSOs have not had the opportunity to be part of the initiative.

One of GODI's thematic agenda was to increase economic prospects of citizens through its data portal to spur technological innovations. Key data users among the developer community in Ghana are Tech firms and Tech incubator. These firms largely depend on open data for their activities. Analysis of the findings revealed most developer communities in Ghana have not had the opportunity to be part of the initiative. Further, these firms though use a lot of government data, face a lot of challenges in accessing and acquisition of government data.

Besides, some have bemoaned on the format and quality of datasets published on the portal. This was an indication of the lower level of engagement with the developer community. Consequently, these setbacks affected the format and quality of datasets published on the portal. Table 7.2 summarizes the effect of environmental factors on GODI implementation as low, moderate and high.

Table 7.2: Summary of Environmental Factors Fit for GODI

Level of Environmental Factors Fit for GODI				
Requirement	Characteristics	Fit		
		<i>Low</i>	<i>Moderate</i>	<i>High</i>
Environmental Factors	Public sector Agencies			√
	CSO Involvement			√
	Developer Community (key Data Users)			√

Source: Author's construction

7.2.1.3. Analysis of Technical Requirement Fit for GODI

The technical requirements were relevant fit for the implementation of the initiative. NITA had all the technical requirements in mind whilst the project implementation was ongoing. It was evident from the findings that, in spite of the relatively low knowledge in the open government data phenomenon, NITA executed majority of the technical task with limited technical skills at the time. As enumerated in the previous chapter, the technical requirements fit of GODI's implementation were; technical competencies of staff, publishing standards, functional requirements, data portal development and published datasets and training for staff.

Staff of NITA did not have any technical skills prior to the commencement of the project. The NITA team learnt on the job in the presence of the WF consulting team at the beginning of the project. Again, the project team gained several experiences out of the international conferences on open data attended. Whilst building the portal, the team was motivated by their own effort

at making the project a reality. It was revealed that the consulting agency then WF did not formally orient them on the technical requirements of OGD though their guidance greatly helped in the development of the portal. The team held the forth, continued the project to its current state after the WF team left barely six months into the project. Across the MDAs, it was noted that none had any technical knowhow on OGD. This however, had impacted on the initiative hence, not operating to meet the standards of best global OGD practice.

NITA faced several challenges with respect to best publishing standards due to their limited technical know-how coupled with the exit of the WF technical team. Published datasets on the portal were not well-structured hence, resulting in several data inconsistencies. An important criterion of OGD publishing standard is for datasets to be machine-readable. Analysis of datasets on the portal revealed they are machine-readable. However, the datasets were only available in only one format thus, CSV. Datasets were not also packaged well for which developers had complained severally to NITA. It was revealed from the findings that, data produced by the MDAs were largely hard copies and PDF which are not machine-readable and in some cases .xlsx or .docx which is proprietary. The GODI Technical team had to clean the data before publishing them on the portal. Hence, the effect on the format of datasets published.

On the functional requirements of the GODI data portal, several modules were included in the initial state of the development. Analysis of the portal functional requirements indicates most functional requirements were present. Notably, features such as its dataset accessibility, searchability, data catalog, social media presence, dataset request and suggestion were visible and functioning. However, absent was the visualization of data on the portal. Again, the datasets were not available in multiple downloadable formats. GODI's Technical Team believe OGD standards must be followed. That notwithstanding, coming-out with a final data portal

irrespective of the standards was their priority. Following this, OGD standards, per NITA’s understanding were mere basic requirements and not strict rules as stipulated in the literature which could make the portal non-compliance with international best practices.

An ostensibly new phenomenon like OGD in the country would require training of all actors across its ecosystem to enhance their skills and competencies to be able to execute the project as expected. Be that as it may, developing and sustaining such a national innovative initiative requires more technical and managerial competencies. That notwithstanding, GODI started without any form of formal training. For instance, NITA staff assigned to the project who hitherto, needed to have been trained did not receive any form of technical or administrative training from the consulting team from the WF. Further, none of the data supply agency staff were given any form of training. The lack of training for staff consequently impacted the execution of the project with respect to the generation and publishing of quality datasets. Table 7.3 summarizes the Technical requirements fit effect on the implementation of the initiative.

Table 7.3: Summary of Technical Requirement Fit for GODI

Level of Technical Requirements Fit for GODI				
Requirement	Characteristics	Fit		
		<i>Low</i>	<i>Moderate</i>	<i>High</i>
Technical Requirements	Technical Competences of staff			√
	Publishing Standards			√
	Functional Requirements			√
	Data Portal Datasets			√
	Training			√

Source: Author’s construction

7.2.2. Economic, IT Infrastructure and Organisational Viability of GODI

This section analyses the economic viability of GODI's implementation per the case findings in line with the underpinning theoretical framework. The viability factors of the FVT as presented in the case are; economic, IT infrastructure and organisational viability of GODI.

7.2.2.1. Analysis of GODI's Economic Viability

Findings from the previous chapter suggest the economic viability of GODI was premised on the value of datasets published on the portal. The economic viability of GODI as summarized in Table 6.5 of the previous chapter, list the factors as citizens' participation, level of data access and downloads.

The findings revealed that, at the peak of the project in 2014, the portal had over 1,000 datasets published which attracted several users to the portal. The portal during this period was recording an average hit of 8,000 every month and an average download of about 4,000. This suggests the level of participation of private citizens in the initiative. It was evident however, that majority of the visit and downloads were from outside the country. This also shows an indication that Ghanaian citizens were not actively involved in the initiative. The traction gained by the portal reduced dwindled later in 2014 when the portal became redundant due to lack of maintenance and outdated datasets.

Findings further revealed, GODI had a communication bureau responsible for all public engagement and media encounter. The evidence again suggests, the bureau only existed for the sake of it. It never organised any outreach programme to sensitize citizens on the importance of the initiative. Meanwhile, the initiative needed the involvement of citizens to be able to know what government is doing in line with the initiative objective; economic growth, participatory governance and transparency and accountability. Hence, the lower level of participation by private citizens in the initiative. Citizens are supposed to access the portal know what

government is doing through the published datasets and send feedback for government to improve on its services. However, the relatively low participation by citizens left NITA with minimal opportunities to elicit public sentiments, feedback and suggestions aimed at improving on the entire initiative thus, leading to a redundant portal.

The value proposition of datasets was not the prime aim of NITA. Primarily, NITA was concerned with building the portal and publishing datasets generated by the MDAs. This suggests NITA was not the determinant of the value proposition of published datasets. That notwithstanding, key data users had complained about the quality of datasets published amid other challenges such as outdated and inconsistencies in datasets. For instance, the case of some geospatial datasets on health facilities across the country published on the portal which happened to generate the wrong output. The datasets, after been integrated into an application gave wrong geolocations. Clearly, the value of such data was misplaced because it did not meet the aspirations of the IT firm.

In view of the analysis of the economic viability of GODI, Table 7.4 summarizes its impact on the implementation of the initiative.

Table 7.4: Summary of Economic Viability of GODI

Economic Viability of GODI				
Requirement	Characteristics	Viability		
		<i>Low</i>	<i>Moderate</i>	<i>High</i>
Economic Viability	Citizens Participation	√		
	Data Access and Downloads	√		

Source: Author's construction

7.2.2.2. Analysis of GODI IT Infrastructural Viability

The success of GODI implementation can be attributed to its IT Infrastructure. As summarized in table 6.6, the viability of IT infrastructure for GODI's implementation was premised on the maturity and allocation of resources. This subsection also analysis the eTransform project which is to provide resources to the project.

Findings indicated that before the project commenced in 2011, the WF assessed the political and infrastructural capabilities of Ghana to commence its national OGD. The assessment report indicated that Ghana had the political and infrastructural abilities to start the initiative. Politically, Ghana showed the way through the signing of the OGP partnership and the setting up of the GODI implementation committee with which NITA spearheaded the development of the portal. NITA was already providing e-government services to MDAs across the country. As a result, NITA already had some form of physical infrastructure such as data centre, high performing servers, fibre channel disk storage and other backup storage facilities. Across the country, NITA had more than 100 telecom towers facilitating its e-government internet connectivity. Further findings revealed, government did not provide any new infrastructure dedicated to the project. As a result, NITA leveraged on its existing infrastructure to implement the initiative.

It was evident from the findings that, the existing physical infrastructure, according to a consultant, was ok to continue the project. However, recommendations have been made to NITA to make provisions for newer servers as the project grows of face server downtime. As a result, the current portal is running on a 3-star architecture. NITA is hopeful of migrating the portal to a 5-star soon after it is able to acquire newer IT infrastructure and also update the current portal.

With respect to the allocation of resources, commitment by government has not been forthcoming. NITA has not been allocated any resource both human and technical specifically for the implementation of the project. The current staff managing the project were drawn from other units within NITA to augment the project implementation. Further, findings show that the initiative does not have a dedicated secretariat for the purpose of administering its duties and responsibilities.

Long before the inception of GODI, the Government of Ghana had been looking for funding to support the country's e-government agenda. The World Bank finally injected an amount of \$97 million into the national e-government agenda captioned 'eTransform'. GODI was allocated \$1.00 million to improve on the existing project infrastructure. GODI's improvement project through the eTransform involves the rebuilding of the existing data portal, resource the MDAs, improve the coordination of all actors in the ecosystem and training of all staff involved in the project. Findings revealed the training of data generators in some selected MDAs is ongoing. Again, following the training of the data generator would be the provision of resources to the MDAs. The MDAs would now be able to generate quality datasets in multiple formats and perform the necessary quality assurances. Datasets would now be transmitted to NITA through APIs for further quality checks before publishing on the portal. The drafted national open data policy is part of the eTransform project. Citizens and key data users would now have a place within the initiative through the GODA. The yet to be launched GODA is an online community platform for all data users to join. GODA would be linked to the GODI platform for members to interact frequently with NITA, apply for specific datasets also recommend data format.

Table 7.5 summarizes the IT infrastructure viability on GODI’s implementation into low, moderate and high.

Table 7.5: Summary of IT Infrastructure Viability of GODI

Level of IT Infrastructural Viability of GODI				
Requirement	Characteristics	Viability		
		<i>Low</i>	<i>Moderate</i>	<i>High</i>
IT Infrastructural Viability	Resource Maturity	√		
	Resource Allocation	√		
	E-transform			√

Source: Arthur’s construction

7.2.2.3. Analysis of GODI Organisational Viability

GODI’s organisational viability had an impact on the implementation of the project. The organisational viability effect was characterized by the following factors: Organisational structure, Organisational maturity and Funding.

GODI is being managed by a 5-member team at NITA headed by the Acting Director General. Others include the Project Coordinator, a Technical Lead officer, an Administrative officer and a Communications officer. Each member is assigned specific roles in the implementation process. The team was put in place latter part of the project. In the past, it was just a representative body comprising staff at NITA. The current NSC though seemed well constituted, did not have people with the requisite knowledge in OGD represented. For instance, the management team must have someone with the requisite knowledge in data science or related knowledge. However, there seems to be no such person among the current management structure. Findings show the current technical staff acquired their skill in OGD during the project implementation process. The shortfalls in the technical requirement were partly attributed to the lack of technical and legal personnel to drive the project implementation.

Analysis of the findings further indicates that the current GODI structure is not solid hence, the seeming ineffectiveness of the project.

Ostensibly, getting executive buy-in from government in support of the project has not been easy for the management team. It is for this reason that NITA had to solely support the project from its limited budgetary allocation. That notwithstanding, the commitment of the management team in terms of projecting government through a national portal was high.

Funding apparently, was a major challenge to NITA in the maintenance and sustenance of the initiative. It was evident from the findings that, major tasks that could not be undertaken were due to financial constrained. For instance, lack of; training for NITA staff on the project and data generators, regular stakeholder engagements, advocacy and the acquisition of new IT infrastructure were all as a result of funding. All these shortcomings apparently, affected the project in several forms. In the case of training of data generators, the lack of funds to train them impacted on the quality of data produced for onward publishing on to the portal. The eTransform came in at an opportune time when GODI was faced with a major financial hurdle.

Table 7.6 summarizes the organisational viability and effect on GODI

Table 7.6: Summary of Organisational Viability of GODI

Level of Organisational Viability of GODI				
Requirement	Characteristics	Viability		
		<i>Low</i>	<i>Moderate</i>	<i>High</i>
Organisational Viability	Organisational Structure	√		
	Organisational Maturity	√		
	Funding	√		

Source: Author's construction

7.3. Discussions and Findings

The subsections offer a discussion on the analysed findings in relation to literature. This is aimed at answering the underpinning research questions. The discussion is divided into three parts which reflect the three research questions and the constructs in the research framework.

The research questions are:

1. How fit is the implementation of government open data in a developing economy?
2. How viable is the Ghana open data initiative since its inception?
3. What is the level of performance of the Ghana open data initiative over the period?

7.3.1. The Task, Technology and Environmental fit on GODI Implementation

This section presents the discussion on the fit requirements and how, the task, technology and environmental requirements fits impacted on the GODI. The section also seeks to answer the first research question of determining the fit requirement impact on GODI's implementation. From the analysis of the findings, Ghana, was motivated to join the global open government partnership due to the seeming quest for the nation to achieve its political mantra of being politically and economically open to the international community. Hence, the signing of the OGP. The signing of the OGP mandated Ghana to make commitments towards the making government open. This subsequently, led to the initiation of the GODI with which the government would liberate its data through the building of a national open data portal. This is as a result of the fact that data is driving the economy of most developing countries across the globe. That notwithstanding, in pursuit of better governance, economic growth, transparency and participatory democracy Ghana decided to implement the OGDI. This finding confirms the conclusions of Ohemeng & Oforu-Adarkwa (2015) on their analysis of GODI. Similarly, Gascó-Hernández et al. (2018), confirmed the relatively driving forces of initiating OGDI and discovered that, socio-economic and political forces are the key elements driving political

economies toward the implementation of OGD. This assertion confirms the findings of this study, thus in this study, a driving force in the implementation of national OGDI is to attain openness, transparency and proper accountability. This discussion tends to suggest that:

Finding One (F1): Ghana joined the OGP partnership in response to the international community demand for governments' openness, transparency proper accountability towards the socio-economic wellbeing of its citizens.

7.3.1.1. Legal Task Fit

Further, analysis of the task characteristics of the fit requirements indicates that the sustenance of GODI is largely dependent on the passage of the RTI bill into law, other regulatory frameworks such as national open data policy and an open data license are key factors which positively impact on the OGDI. Technically, GODI is “*legally-not-opened*” by default as a result of the current legal and regulatory barriers in the acquisition and publishing of datasets for citizens to access subject to minimal restrictions on the user. This is consistent with earlier research on licensing and regulating of national OGDI (Morrison, 2017; Korn & Oppenheim, 2011). Licensing regime for open data portals gives permission to data users (including private citizens, businesses and key data users) the opportunity to access and innovate with the open government data. Moreover, an open license ensures that datasets published on data portals provide legal permission for data users to access and use the data, stimulates utilization and distribution. Thus far, analysis of the legal and regulatory fit requirements such as: the RTI, the open data policy, the Data Protection Act (Act 843) and the open data license for the portal has a positive relationship in the implementation of GODI. Further, in confirming this finding, Janssen et al. (2012) and Dietrich et al. (2012) are of the view that the legal and regulatory requirements have a direct impact on the implementation of OGD. This discussion tends to suggest that:

Finding Two (F2): The passage of the right to information bill into law and the development of a national open data policy is a necessary pre-requisite to promoting effective GODI.

7.3.1.2. Environmental Task Fit

Also, the analysis of the task fit of GODI suggests that the enactment of OGD needs broader consultation between the implementing body and all actors within the ecosystem which represents its environment. A national OGD like GODI is surrounded by several actors including public sector agencies, CSOs and developers. Analysis of the findings reveals that it is not only the ability to engage them that transcend into their active involvement in the project but the frequency and the ability to seek their views on a regular basis helps make the initiative vibrant.

In the initiation of OGDI, extant literature are of the view that, the implementing agency recognizes the role of data generators who are mainly within the public agencies. The role of data generating agencies greatly impacts on the implementation of OGDI. Shao (2018) and Glasson & Wood (2009) for instance, indicated that an important actor besides the implementing agency is the public sector data generators. The authors further argue that in order to sustain the implementation of OGD the public sector must be well integrated into the process to be able to provide the needed data towards sustaining the initiative. This assertion is consistent with the finding of this study.

The identification of the task fit in relation with consultations of stakeholder of GODI was done. However, the consultation was not effectively carried out. Consequently, its effects on the implementation of the initiative were felt during the generation of the datasets. As indicated by Fageha & Aibinu (2013), the execution of every project most especially in the planning

stage need the involvement of all stakeholders concerned. Further, CSOs and developers also serve as watch-dogs through their active participation to ensure that data published is of public interest and meet the demands and aspirations of citizens. Thus, the involvement of stakeholders of diverse spectrum such as; application development, academia, research, CSO and media can't be ignored in the implementation of OGDIs (Dawes et al., 2016; Rossi & Kinnari, 2014). This discussion tends to suggest that:

Finding Three (F3): The engagement of all stakeholders in the open government data ecosystem in Ghana is necessary to promote a culture of openness among MDAs across developing economies.

7.3.1.3. Technology Task Fit

Another requirement fit for effective implementation of OGDI is the technical requirement besides the legal and environmental fit. The analysis of GODI's fit requirements suggest that the sustainability of an OGDI depends on the availability of top-notch technical personnel with the required technical competence, knowledge on the standard procedure for publishing, data portal functionalities and constant training of staff. The related analysis suggests the technical competencies of staff of both the implementing agency and the data suppliers provides unique opportunities for the initiative. Further, the competencies of the implementing agencies would be to see to the planning and executing of a standard national OGDI in line with the best practices and sustainability of the initiative. That notwithstanding, staff assigned to the initiative did not have the technical competencies prior to the project initiation. This characteristic challenged the initiative to meet its standard technical requirements such as improve information technology infrastructure, enhance privacy and information security, and integration of OGD tools and applications as indicated by (Ubaldi, 2013). Further, from the findings, the required information infrastructure was not provided for the generation of datasets

which consequently affected the standard of data published on the portal. This discussion tends to suggest that:

Finding Four (F4): The technology characteristics in respect of technical competence of both data suppliers and demanders, and adherence to best OGD accepted policy and guidelines have an impact on the implementation of open government data in Ghana.

OGD publishing standards require that datasets be well structured in its raw form, cataloged and making data both human and machine-readable. GODI portal could not meet most of these standards thus, affecting the standard of publishing of datasets. This finding is in contravention with W3C and the World Bank publishing standards of open data (Herzog, 2014; Bennett & Harvey 2009). Consistent with the functional requirements, NITA had integrated most of the functionalities as stipulated into the portal development. GODI's data portal functional requirements such as: data search, link to external site and social media integration were visible and actively working. However, other functionalities such as data visualization, metadata organisation and multiple data format downloads were not present. These portal functionalities identified, were also consistent with Afful-Dadzie & Afful-Dadzie (2018), the W3C and world Bank's OGD implementation toolkits audit strategy in assessing the technical requirements of OGD web portals.

Again, the datasets published on the portal technically have to meet the required standards. The analysis indicates that the manner in which the datasets are packaged technically affects the quality of data repository on the portal. NITA's inability to publish datasets of the required specification in respect of format and package was partly attributed to the manner in which the data were produced by the data generators. This finding does not deviate from the assertion of

Afful-Dadzie & Afful-Dadzie, 2017b) who maintain that datasets must be published in a multiple machine-readable formats for utilization. From the analysis, the portal has only one format presented on all published datasets i.e., CSV.

Training is an essential part of an emerging initiative like OGD. Thus, it was envisaged that all personnel would be given the required technical and administrative training. Analysis of the implementation strategy showed that the inability of the consulting team to give all personnel the needed training affected the implementation strategy. For instance, data generators did not know their roles and responsibilities. Again, they could not follow the right procedure in the gathering and generation of datasets because they lacked the technical and administrative expertise. This resulted in the submission of hardcopy and proprietary data format to NITA staff for publishing. As indicated earlier, the mode of extraction, collection and generation of raw data has an impact on the sustenance of OGD data repository. Analysis of the case indicated that most of the technical challenges could have been averted if effective training was given to staff most especially technical staff of NITA and MDAs assigned to the project. Indeed, this finding is consistent with previous studies on the need to provide training and technical support on the open data practices (Shao, 2018; Chatwin & Arku, 2018). It is evident from GODI's implementation strategy that training also involves record management activities, maintenance of policies and guidelines for keeping updated records and provision of resources for the sustenance of the Open Government Initiative to give it international recognition. This discussion tends to suggest that:

Finding Five (F5): Characteristically, the task, technology and environmental requirements were fit for the implementation of governments open data in Ghana. Nonetheless, the inability of NITA to effectively pursue and apply these requirements affected the implementation of GODI across its ecosystem.

7.3.2. The Economic, IT Infrastructure and Organisational Viability of GODI

This section presents the discussion on GODI's viability dimensions and how, the Economic, IT infrastructure and Organisational impact of GODI since its implementation. The section also seeks to answer the second research question of determining how the viable GODI has been since its inception almost a decade now.

7.3.2.1. Economic Viability

The analysis revealed the viability of OGD is vital because of the diverse economic opportunities it provides to citizens and organisations in the country in transforming their socio-economic activities. GODI's economic viability is characterized by the level of citizens' participation and the number of downloads. Further, it was revealed from the analysis that, OGD is supposed to generate citizens interest and participation through the publication of datasets of higher economic value (Ahmadi Zeleti et al., 2016; Fauscette, 2009). GODI's performance in respect of its value creation agenda was very low as findings suggest.

Arguably, the value of data is dependent on the user, thus, users would find it worth visiting an open data portal if they acknowledge dataset would meet their needs. The GODI data portal gained traction at the initial state of the project due to the fact that data published were current and could meet the needs of users at the time. The level of downloads reduced later in 2014 due to the fact that NITA stopped publishing newer datasets making the portal redundant till date. Again, revealed was the fact that, the most current datasets published was in February 2016. Clearly, such dataset is out of date and contradicts Afful-Dadzie & Afful-Dadzie (2018) 'data currentness' criteria for assessing the quality of data published on the portal. Moreover, the finding suggests that NITA was not concerned with the value of the datasets produced, thus, they were preoccupied with the development of the portal and the publishing of datasets

delivered to them. This revelation is an indication that NITA was not performing any quality assurance on the dataset before publishing them. This act again contradicts the Open Data Barometer (2013) recommendations for quality assurance checks before publishing datasets. It is evident however, that the sustained availability of consistent and regularly updated data is essential to realizing the economic value of GODI. Nevertheless, the value proposition of published datasets did not meet the economic aspirations of users. This discussion thus, tends to suggest that:

Finding Six (F6): The economic value of datasets published on the data portal predetermines the level of participation of citizens to download datasets to use, reuse and redistribute.

7.3.2.2. IT Infrastructure Viability

The IT infrastructure viability of the implementing agency has an association with the nation's ability to implement an innovative system like OGD. GODI's infrastructure viability which consists of IT infrastructure maturity and resource allocation had an influence implementation of the project. The analysis of the IT infrastructure viability suggests that a country's IT infrastructure investment is directly linked to the IT resource maturity (Shao, 2018). In addition, NITA's existing IT infrastructure has been proven to be ok by the WF. Further findings from the analysis indicate that, though the WF consultant has indicated that though NITA's Data Centre and other networking and data management infrastructure was fit and viable, they need to be upgraded to meet the demand of the project in future. Evidence also supports the findings that the portal would gain further international recognition if NITA is able to migrate the platform to a 5-star architecture. Further, NITA server and data management infrastructure is susceptible to attacks and downtimes should they migrate to a 5-star with its existing hardware and internet space. Thus, NITA's existing infrastructure is said to be matured to meet current demand. This finding is consistent with literature that a country's government

information communication technology (ICT) readiness and e-participation has a positively, significant interaction effect on e-government resource maturity (Pudjianto, Zo, Ciganek, & Rho, 2011; Liang et al., 2007). The results of the analysis further confirm the government over the years have not allocated any physical infrastructure to support the project. The eTransforms findings revealed, was to resource the project with which the portal would be rebuilt to meet an international standard. Hence, the IT infrastructure viability of GODI suggestively, have not contributed much to its viability. This discussion tends to suggest that:

Finding Seven (F7): The maturity of IT infrastructure of NITA which is a measure of their physical infrastructure capabilities and readiness and human resource competencies is critical to the viability of GODI's implementation.

7.3.2.3. Organisational Viability

The analysis of the organisational viability was hinged on the organisational structure, organisational maturity (readiness and support) and funding. All these three factors affected GODI's implementation in diverse ways. For instance, a major problem with the project execution was the management structure. Findings revealed the supervisory board was ineffective due to their lower level of understanding of the initiative. The Supervisory Board though was headed by the office of the Senior Minister under the office of the President, lacks the necessary support for the project. Again revealed, was the fact that, getting executive buy-in by NITA in support of the project was difficult. The NITA management team on the other hand, had to support the initiative from NITA's own resource to sustain the project. This finding suggests the initiative was challenged due to lack of adequate government support. Findings also revealed management over the years have not appropriated resource to the MDAs responsible for data generation in support of the project implementation. Studies revealed, without the support of the top management, national OGDI is likely to be endangered (Gascó-

Hernández et al., 2018). Further, the analysis revealed budgetary allocation shortage to NITA to manage and maintain GODI also resulted in the lower motivation of all staff across. The findings confirm Gasco-hernandez & Gil-garcia (2018) and Krishnamurthy & Awazu (2016) in a similar study. Also, other extant studies have discovered that organisational maturity (readiness and support) for OGDIs is critical to the economic prospects of government (Ahmadi Zeleti et al., 2016). This assertion is contrary to the findings of this study, thus in this study, NITA as the implementing agency has not been able to make the initiative economically viable for citizens to pursue. Hence, GODI has not been economically viable since its inception. This discussion tends to suggest that:

Finding Eight (F8): GODI's organisational structure which is a measure of the level of readiness and support, largely affected its viability.

7.3.3. The Performance of GODI in its Implementation

This section presents the discussion on the level of performance of GODI over the period. Performance of a national OGDIs according to Ibrahim et al. (2016) is measured by system usage and user satisfaction. Following suit, the study analysed the GODI's performance in line with the latter's criteria. This assisted the study to seek answers to the third question of the research on the level of performance of GODI over the period.

Consistent with Ibrahim et al. (2016) and in-line with the objective of the FVT Liang et al. (2007), Table 7.7 summarizes the performance of the GODI evaluated based on the listed questions elicited from the analysis of the findings.

Table 7.7: Summary of GODI's Performance

<i>Fit and Viability Assessment of GODI</i>	<i>Yes</i>	<i>No</i>
1. Was the initiative fit for its intended usage?	√	
2. Was the initiative consistent with the expectations of users?		√
3. Were key data user's engagement and participation in the initiative encouraging?		√
4. Did the web portal datasets satisfy the user needs?		√
5. Has government achieved the intended objective of the project implementation?		√

Source: Author's construction

From the analysis, items for measuring fit and viability of GODI was based on the 5 latent themes arising out of the discussions. From the research questions one and two, both fit and viability dimensions analysed pointed led to the conclusion that GODI has not done well in its implementation. Findings from the fit dimensions for instance, indicated that the initiative was fit for the purpose for which it was initiated, thus higher fit. That notwithstanding, the necessary technical and human resources needed to make the initiative viable were lacking hence, the lower viability. The findings from the fit and viability assessment discussed from the case analysis thus allow the derivation of the suggestion that:

Finding Nine (F9): While GODI was a Fit for the purpose for which it was implemented, it was far from achieving its viability objectives.

Finding Ten (F10): The level of performance of GODI almost a decade after its inception has been below expectation hence, low performance.

7.4.7.4 Chapter Summary

This chapter discussed the analysis of the findings presented in the preceding chapter by reviewing literature in order to address the research questions posed at the beginning of this

study. The chapter commenced with an analysis of the task, environmental and technology dimension of GODI's implementation. This was followed by the analysis of the economic, IT infrastructure and organisational viability of GODI. The chapter finally discussed both the fit and viability dimensions of GODI again concluded on the performance of GODI over the years based on the FVT. The next chapter gives an evaluation and a summary of this study and goes on to discuss the contribution of this study to knowledge and its implications for research, practice and policy. Subsequently, the chapter discusses the limitations of the study and provides researchers with recommendations for further research and then presents a general conclusion.

CHAPTER EIGHT

SUMMARY, CONCLUSION AND RECOMMENDATIONS

8.1. Chapter Overview

The previous chapters presented the introduction to the study, review of literature, research framework, the methodology, analysis and discussion of findings. This concluding chapter focuses on presenting a summary of the key findings of the study, discussion on the contribution to research, policy, and practice. It further presents the limitations of the study and recommendations for further research.

8.2. Summary of the Research Process

The study assessed the implementation of GODI almost a decade after its implementation in order to determine strategies towards better outcomes. Specifically, the study evaluated how task and technology fit requirements together with economic, IT infrastructure and organisational viability has impacted the overall performance of GODI. Additionally, the study focused on the three key actors in the GODI ecosystem: Implementing Agency, Data Suppliers and Key Data Users (Demanders). To this end, the following objectives were formulated for the research:

1. Determine the fit of the implementation of open government data in Ghana.
2. Determine the viability of the Ghana open data initiative since its inception.
3. Determine the level of performance of the Ghana open data initiative over the period.

In addressing these objectives, the Fit Viability theory was adopted as theoretical guiding lens for the study. The FVT was chosen because it is considered appropriate for assessing the GODI in its (1) implementation processes close to a decade and (2) performance expectation from

users regarding the project implementation by NITA. This assessment is thus, based on its task-technology fit requirements and the economic, IT infrastructure and organizational viability (Geginat & Saltane, 2016; Zuiderwijk & Janssen, 2014; Vicente & Novo, 2014). Additionally, the fit dimension of the FVT was extended to include a third construct which is *environmental requirement fit*. This extension aided in assessing all other actors especially, stakeholders whose engagements are relevant to the implementation of OGDI aside the implementing body.

After a thorough review of literature, a critical realism research paradigm and case study approach were chosen that employed semi-structured interviews with the six key actors in the GODI ecosystem. Findings were presented after the collection of data which was subsequently analysed and discussed in-line with the underpinning research questions and the adopted research framework. The analysis of findings in chapter six led to ten findings. These findings are mapped to each research question and respective contribution to research and practice in the section that follows.

8.3. Mapping Research Objectives to Findings and Contributions

This section seeks to map the research objectives to the research findings, recommendations and the contributions to practice and research. The findings of the study are presented in three folds. First, the findings on the fit dimensions which describe the task, technology and environmental requirements of GODI. The second findings on the viability dimension and the third on the performance of GODI closed to a decade after its implementation. Summary of the research findings followed by a table that maps the research objectives to the findings and contribution is shown in Thesis Matrix in Table 8.1. The table also summarizes the research implications and recommendations.

Table 8. 1: Mapping Research Objectives to Findings and Contributions

Research Purpose: The main purpose of this study is to assess the implementation of OGD in Ghana almost a decade after its implementation. The study seeks to evaluate how task and technology fit requirements together with economic, IT infrastructure and organisational viability has impacted the overall performance of GODI.

Task, Technology and Environmental Fit Requirements of GODI

Research Objectives	Research Findings	Extant Literature	Contributions, Implications and Recommendations
<p>To determine the fit of the implementation of open government data in a developing economy.</p>	<ol style="list-style-type: none"> 1. Ghana joined the Open Government Partnership in response to the international community demand for governments’ openness, transparency, proper accountability towards the socio-economic wellbeing of its citizens. 2. The passage of the right to information bill into law and the development of a national open data policy is a necessary pre-requisite to promoting effective GODI. 3. The engagement of all stakeholders in the open government data ecosystem in Ghana is necessary to promote a culture of openness among MDAs across developing economies. 	<p>According to Ubaldi (2013), fit characteristics must be legally and technically open. Thus, the legal/regulatory requirements of GODI such as: the RTI, the open data policy, the Data Protection Act (Act 843) and OGD licenses impact on the implementation of government open data initiative (Afful-Dadzie & Afful-Dadzie, 2017a; Ohemeng & Ofosu-Adarkwa, 2015; Janssen et al., 2012).</p> <p>Additionally, the engagement of stakeholders such as: software developers, researchers and CSO cannot be ignored in the implementation of OGD (Shao, 2018; Dawes et al., 2016).</p>	<p>The study offered a considerable understanding of what necessitate governments to commence OGD. This study brings to bear the need for IS researchers to extend their studies on assessing the need, implication and impact of OGD.</p> <p>The theory also provides researchers the understanding of how important external factors such as stakeholder engagement is in the implementation of OGD.</p> <p>This study arguably was the first to assess a national OGD of its level of performance using the fit viability theory and presents a multi-stakeholder perspective of OGD in a developing economy like Ghana to determine its fit and viability.</p>

Research Objectives	Research Findings	Extant Literature	Contributions, Implications and Recommendations
	<p>4. The technology characteristics in respect of technical competence of both data suppliers and demanders and adherence to best OGD accepted policy and guidelines have an impact on the implementation of open government data in Ghana.</p> <p>5. Characteristically, the task, technology and environmental requirements were fit for the implementation of governments open data in Ghana. Nonetheless, the inability of NITA to effectively pursue and apply these requirements affected the implementation of GODI across its ecosystem.</p>	<p>The functionalities of the portal and the dataset specification must be consistent with the W3C and world Bank's OGD implementation benchmarks for assessing the technical requirements of OGD web portals (Afful-Dadzie & Afful-Dadzie, 2017b; Chatfield & Reddick, 2017; Krishnamurthy & Awazu, 2016; Yang & Wu, 2016)</p>	<p>The study outlined the legal, technical, organisational and social dimensions which affect the performance of OGD. These dimensions are mostly silent in most literature. Thus, the examination of these success factors must be critically looked at to promote openness of government through OGD.</p>

Economic, IT infrastructure and Organisational Viability GODI

Research Objectives	Research Findings	Extant Literature	Contributions, Implications and Recommendations
<p>To determine the viability of the Ghana Open Data Initiative since its inception.</p>	<p>6. The economic value of datasets published on the data portal predetermines the level of participation of citizens to download datasets to use, reuse and redistribute.</p>	<p>Need to assess how viable GODI has been since its inception (Krishnamurthy & Awazu, 2016; Krishnan, Teo, & Lymm, 2017; Wang & Lo, 2016; Ahmadi Zeleti, Ojo, & Curry, 2016).</p>	<p>This study again focused on the need for government to build institutional capability and skill through the provision of technical infrastructure, training and development of human resources to build a robust information infrastructure across all state agencies.</p>

Research Objectives	Research Findings	Extant Literature	Contributions, Implications and Recommendations
	<p>7. The maturity of IT infrastructure of NITA which is a measure of their physical infrastructure capabilities and readiness and human resource competencies is critical to the viability of GODI's implementation.</p> <p>8. GODI's organisational structure which is a measure of the level of readiness and support, largely affected its viability.</p>	<p>Ahmadi Zeleti et al. (2016) and Fauscette (2009) assert that OGD is supposed to generate citizens interest and participation through the publication of datasets of higher economic value.</p> <p>Meanwhile, studies have discovered that organisational maturity (readiness and support) for OGDI is critical to the economic prospects of government (Ahmadi Zeleti et al., 2016).</p>	<p>The study offered a considerable understanding of how regular engagement with data users will boost their interests in participation and use of open data portal.</p> <p>The study provides an opportunity for OGD implementing agencies in developing economies the need to follow standard procedures that best work in their ecosystem. The study established that data/information infrastructure; technical competence, well-resource project team across all state agencies should be critically looked at in the implementation of OGD. This ensures proper compliance with best practices and further compare their standards with international standards.</p>

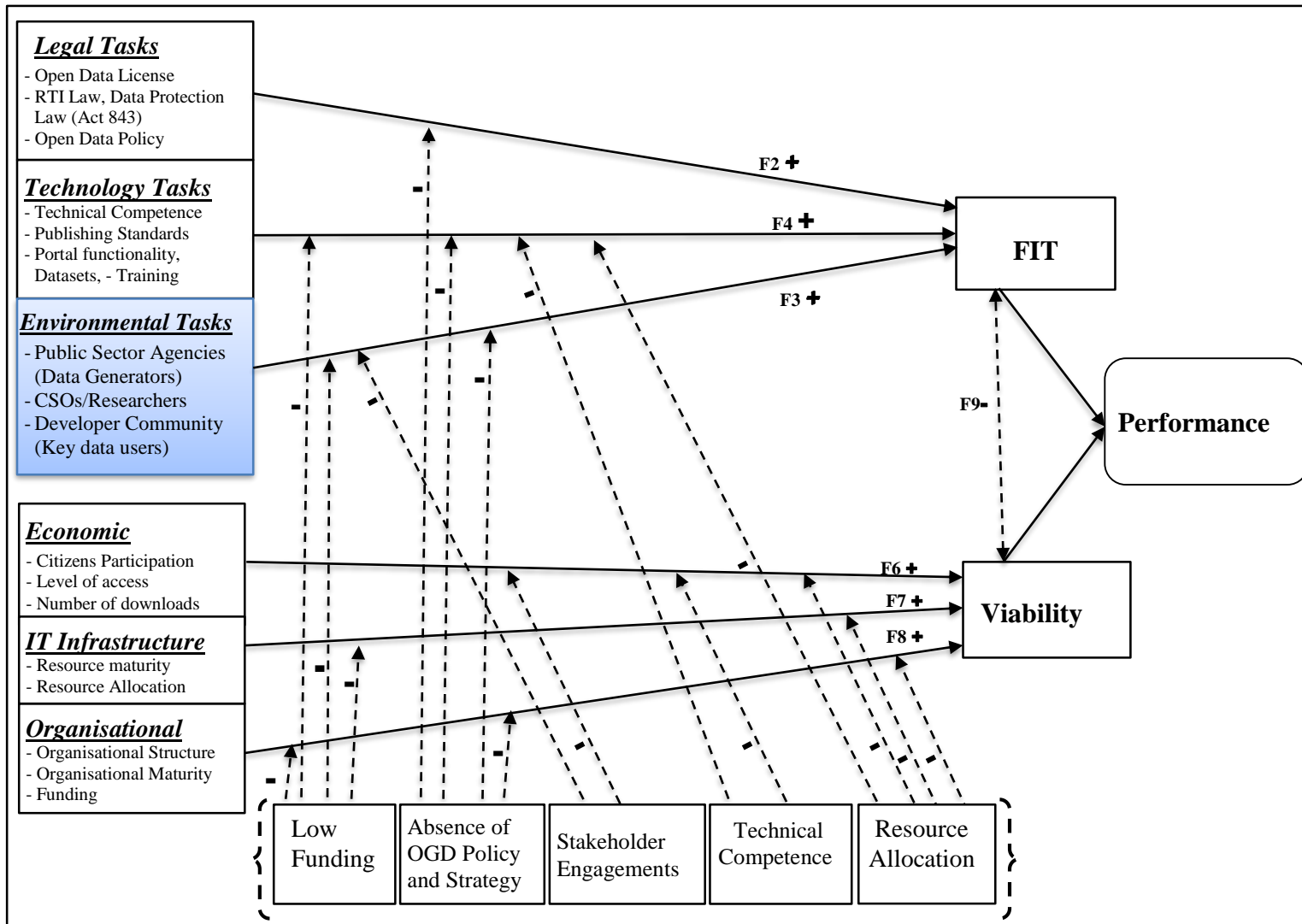
The Level of Performance of GODI

Research Objectives	Research Findings	Extant Literature	Contributions, Implications and Recommendations
To determine the level of performance of the Ghana Open Data	9. While GODI was a Fit for the purpose for which it was implemented, it was far from achieving its viability objectives.	Need to assess the level of performance of GODI over the period (Ibrahim, Akinwande, & Ibrahim, 2016; Dawes, Vidiasova, & Parkhimovich, 2016; Zuiderwijk &	There is a need for the developing economies to satisfactorily analyze both national and international legal frameworks that have implications on the implementation and use of OGD.

Research Objectives	Research Findings	Extant Literature	Contributions, Implications and Recommendations
initiative over the period.	10. The level of performance of GODI almost a decade after its inception has been below expectation hence, low performance.	Janssen, 2014; Delmar, McKelvie, & Wennberg, 2013)	Laws that stand as barriers in the implementation of OGD should be removed whilst working hard to promote the enacting relevant laws that help make OGDI effective. The study advocates for government to institute a national open data policy and ensure its compliance among all agencies to achieve a sustainable OGDI.

Source: Author's construction

Figure 8.1: Refined Fit-Viability Conceptual Framework for OGD



Key: - / + - Negative/Positive impact variable | F - Study Finding

Source: Author's construction

8.3.1. The Fit Requirements of GODI

The analysis and discussion on the fit requirements of GODI unearthed five findings. The findings revealed that GODI was fit for the purpose for which it was implemented as shown in Figure 8.1. However, the implementation according to the analysis revealed that the individual task, technology and environmental characteristics identified did not meet the mandatory fit characteristics of OGD. Further, the task requirements of GODI were based on the legal and regulatory regimes in the country. The factors which included open data license, national open data policy, Data Protection Law (Act 843) and the RTI bill were fit for the implementation of GODI. Again, the technical fit requirements such as competencies of staff, data portal functionality, publishing standards and datasets formats were also fit for the implementation of GODI. Additionally, the engagement of stakeholders within an OGD ecosystem like public sector agencies, CSOs and key data users who form the external environment are also fit for GODI's implementation. Findings indicate that, the involvement of these stakeholders is key to accomplishing the objectives of GODI. This important factor led to the extension of the task-technology dimension of fit dimension to include environmental requirement fit as shown in Figure 8.1. These environmental factors primarily represent all other key actors within the implementation strategy aside the implementing agency (NITA). Thus, findings two, three and four were perfect fit for the implementation of GODI. However, the fit variables (task, technology and environment) were affected by factors such as lower funding, absence of legal framework, less stakeholder engagement and limited technical competence of personnel as shown in Figure 8.1. For instance, NITA could not train and also engage relevant stakeholders due to lack of funding which affected the fit requirements. Hence, the inability of the implementing agency to effectively employ these fit requirements affected the implementation strategy.

8.3.2. The Viability of GODI

The second research objective of determining how viable GODI has been since its inception was hinged on its economic viability, IT infrastructure and organisational maturity. These factors have their respective impact on GODI's implementation and performance. Factors of each viability characteristic were identified and assessed to determine the extent of effect on GODI as shown in figure 8.1.

Finding six (6) of the study which stated that the quality and economic value of datasets published on the data portal predetermines the level of downloads by data consumers to use, reuse and redistribute. The data quality and value were confirmed to have a positive influence on the level of participation of citizens in the GODI. That is to say, the quality and value of datasets generated and subsequently published by NITA onto the web portal have the ability to attract multiple data consumers onto the portal. Again, if the datasets meet the aspirations of users, they will frequent the data portal for more of such datasets. Essentially, citizens have not benefited from GODI due to the lower quality and value of published datasets hence, its lower economic viability.

Finding seven (7) of the study indicated that the maturity of a country's IT infrastructure which is a measure of IT infrastructure capabilities and readiness, and human resource competencies is critical to the viability of GODI. Analysis of the finding indicates NITA's existing IT infrastructure had impacted in the project implementation due to their inability to acquire new IT infrastructure dedicated for the project. Consequently, these factors affected the sustenance and viability of GODI.

Finding eight (8) of the study indicated that organisational structure which is a measure of the level of readiness and support impacted on GODI's viability. These factors included GODI management structure, organisational maturity (readiness and support) and the availability of funding from central government. These factors the finding suggests affected the viability of GODI since its inception. However, these issues are being minimized with the inception of the eTransform project. A World Bank support initiative to improve on Government of Ghana's e-government initiatives comes with a funding package to resource GODI in order to make the portal more vibrant with current and quality datasets.

In a nutshell, GODI has not been viable since its inception as a result of the impact of the viability factors on the implementation of the project.

8.3.3. The Level of Performance of GODI

Finally, the level of performance of the GODI since its inception answered the third question of the study. The level of performance is a measure of how both fit and viability dimensions impacted on the initiative. After analysis and discussion of findings, finding nine (9) and ten (10) concludes that the level of performance of GODI almost a decade after its inception has been below expectation, leading to relatively low performance of the initiative. This can be attributed to the larger effects on the respective attributes of the fit and viability requirements. This also confirms that fit requirement of OGDI may be high, but if it's not effectively implemented will affect the performance. The findings consequently reveal higher task, technology and environmental fit does not necessarily result into higher viability.

8.4. Strategies to Improve the outcome of Ghana Open Data Initiative

In view of the unimpressive performance of GODI primarily due to low citizen participation, lack of funding and of technical personnel, and the absence of a national OGD policy and strategy as shown in Figure 8.1, the study suggests the following strategies to guide especially the GODI sponsor, the Government of Ghana and the implementing body, NITA. The strategies take into considerations best practices across most successful OGD implementing countries. It is expected that it would serve as a rich foundation towards making the initiative more vibrant.

1. Development of a clear and achievable national OGD policy guideline and strategy

Ghana after joining the OGP has not been able to develop a national OGD policy to direct and guide actors in the OGD ecosystem in the country. The presence of a policy framework would enumerate the roles, responsibilities, resources, as well as strategies and timelines to make the initiative sustainable. The absence of a functional policy framework to a large extent, has impacted on the activities of all key actors. The Open Data Barometer (2018) for instance, noted that most governments tend to develop OGD policies and strategies after the establishment of the national OGD initiative. This, the report maintained, tends to make the policies and strategies in most cases, inactive. In Africa for instance, the development of OGD policy and strategy has largely been described as underdeveloped (Open Data Barometer, 2018) and as a result, OGD initiatives are becoming redundant (Akinwande & Ibrahim, 2015). In view of this, efforts must be put in place to ensure the speedy drafting of a national OGD policy and strategy for Ghana.

2. Execution of the national level OGD action plans

The OGD action plan catalogues commitments to be achieved along with the implementation of the project. Over the years, Ghana has submitted three actions plans to the OGP with over 20 commitments. However, the accomplishment of these action plans has never been completed. For instance, the 2017 Independent Reporting Mechanism (IRM) report of the OGP indicated that, though Ghana's action plans have the potential to transform measures put in place to accomplish all stated commitments, only a few have been partly implemented. Thus, most of the commitments in the national action plans submitted to the OGP have never been fully accomplished over the period. In the light of these unsuccessful gains, efforts must be put in place to make sure national action plans presented and accepted by OGP are executed within stipulated periods. That notwithstanding, the needed resources needed must be supplied by government and the implementing agency.

3. Strengthening the licensing for data openness

In line with the principle of open by default, Ghana must endeavor to make access to data less daunting to data demanders. Presently, one key challenge facing NITA is the unwillingness of some public sector institutions to release data. This and other legal issues culminate into barriers to liberating data in the public sector. With the passage into law of the RTI, it is expected that it could empower NITA to demand relevant data from public sector institutions for onward publication on the web portal. Besides the RTI, government should develop a clear policy to regulate the licensing for data openness so as to allow more data to be published quickly. Additionally, government data should properly be regulated to ensure that its sanctity and value are preserved for the socio-economic wellbeing of citizens. Further, government

should list the public-owned permissions in line with the Data Protection Act (Act 843) for access to the open datasets and a clear authorization statement to all data demanders and users.

4. Enhancing the capacity of key staff

The sustainability of GODI depends on the competencies of key personnel. In view of the fact that OGD is still evolving, all key stakeholders must be given the needed training to enhance their level of understanding and technical competences. For instance, data generators in the public sector institutions must be given the needed technical skills on the process of gathering and generating datasets of the right standard, quality and format. The apparent lack of technical skill of data generators significantly slows the process of data publication and affects the quality of data on the web portal. Hence, it is imperative for NITA to regularly organize training sessions to enhance data generation and management skills especially of government data suppliers. Besides, NITA as the implementing body must also endeavor to learn from the experiences of successful national OGD, broaden their knowledge and skill and impact them onto GODI.

5. Improving the proportion of machine-readable open data

Data management in the public sector is inundated with multiple redundancies and inconsistencies. For instance, the proportion of data generated by public sector institutions are largely in hardcopy and in some cases proprietary formats such as PDF, xlsx and .docx contrary to the machine readability and re-usability principles that underpin open data publishing standards. Current look at the Ghana Open Data web portal reveals that a large proportion of datasets are not in machine-readable formats such as JSON and CSV. In comparison with best

practices, GODI data platform was far from international standards. In this regard, NITA must endeavor to generate multiple datasets in multiple machine-readable formats.

6. Regular Stakeholder engagement

The objectives of implementing a national OGD would not be achieved if citizens do not participate in the process. Practically, citizens are to interact with government through the GODI platform and send feedback for improved services, promote transparency, accountability and improve government-citizens interactions. In view of this, NITA must have regular engagement with relevant stakeholders in varied field of endeavor. For instance, researchers, CSOs, software developers, and businesses must be regularly engaged. While engaging them, the interactions would determine the kind of data relevant to their activities and also help shape and direct the initiative towards meeting the principles of best OGD practices.

7. Improvement in IT infrastructure and financial support

OGD is a technology-driven innovation hence, the need for improvement in the IT infrastructure among the implementing agency, data suppliers and relevant stakeholders. In spite of the fact that these infrastructures are capital intensive, leadership must endeavor to get executive buy-in for prompt and timely allocation of structural, human and financial supports dedicated to enhancing the effectiveness and sustainability of the initiative. The redundancy of most OGD initiatives has been attributed to the lack of leadership support and political will (Open Data Barometer, 2018). Meanwhile, the provision of the needed resource and infrastructure emanate from leadership and political government. In this regard, there is a need for strong executive buy-in among leadership and central government for financial and infrastructural support. Additionally, there is a need to also integrate OGD with other primary

e-government initiatives in order to enhance visibility. The lack of integration is likely to reduce commitment of governments as other initiatives get their attention.

8.5. Implication for Research, Practice and Policy

The implication of this study can be viewed along three significant strands: research, practice and policy.

8.5.1. Implication for Research

With regards to research, this study contributes to the body of knowledge on the emergence of OGD by probing into its implementations which had received little attention in developing economies. This study brings to bear the need for IS researchers to extend their studies on assessing the need, implication and impact of OGD.

Again, the application of the fit viability theory also encourages researchers to pay more attention to the task and environmental aspect of OGD implementation and performance whilst concentrating not so much on the technical requirements. For instance, (1) factors on the legal requirements which are relevant to encourage usability of OGD, (2) environmental actors who are primarily data generators and data demanders role and engagements and (3) technical requirements such as staff competencies and training impact on OGD needs attention. Issues on viability of OGD, factors which matter for its sustenance including: economic factors such as value of datasets, citizens' participation and downloads; IT infrastructure viability such as the need for the country to have a robust IT infrastructure maturity and government support; organisational factors such as management structure, readiness, support and allocation of funds. These factors were all fit however, viability dimensions derived from the study impacted

on the performance of OGDI. Again, the theory enhances the assessment of OGD based on established factors which affect the performance of the initiative.

Further, the study establishes the need for IS researchers to extend their studies to other aspects of OGD such as the legal, technical and social factors which challenge the implementation of OGD rather than studies focusing more on the technical and social significance.

8.5.2. Implication for Practice

The study contributes to practice by drawing out legal, technical, organisational and social dimensions which affect the performance of OGDI. It is instructive that, these dimensions are critically looked at to promote openness of government through OGDI. There is the need for government to build institutional capacity and skills through the provision of technical infrastructure, training and development of human resources to build a robust information infrastructure across all state agencies. It is also very important to determine the data needs of end users through regular engagement in the implementation process to boost their interests in patronizing the use of open data portal. This will ultimately help government to provide effective guidelines to enhance its decision making on the provision of goods and services to citizens.

Another implication for practice is that OGD implementing agencies in developing economies need to consider the procedures and processes that best work in their ecosystem. The study established that data infrastructure; technical competence, well-resource project team across all state agencies should be critically looked at in the implementation of OGD. This ensures proper compliance with best practices and procedures and further compare their standards with international standards.

8.5.3. Implication for Policy

With regards to policy, there is a need for developing economies to satisfactorily analyze both national and international legal frameworks which have implications on the use of OGD. Subsequently, developing countries will be aware of laws that influence the implementation of OGD and work towards removing such laws or promoting the enacting the needed laws to support OGDI.

The study advocates for government to institute effective national open data policy and guidelines and ensure its compliance among all agencies to achieve an effective and sustainable OGDI.

8.6. Limitations and Future Research Directions

There were some identified limitations with this study which can offer directions for further research. Due to time and resource constraints for the completion of this research, the study could not cover more stakeholders across GODI's ecosystem. Hence, the study could not cover other stakeholders such as CSOs in the project ecosystem. Moreover, the GODI is still under its implementing state with the portal also undergoing further development pending its completion. This limited the study only to the implementing agency, data suppliers and key data users. Again, the study employed only a qualitative methodology to assess the performance of GODI. This methodology however, partly restricted the researcher in terms of the length and breadth of the respondents even though the theory provided the study with the needed understanding of the underlining objective. Further, the study also focused on a specific single case analysis which was directed by the research title. Time constraints also limited the researcher's ability to explore more than one national OGDI in order to do a comparative fit

and viability assessment to determine the implementation and performance among developing economies.

Future research can replicate this study by combining the FVT with other theories for both government and private business to specifically assess the level of use of OGD by private citizens and businesses. Furthermore, given the role played by the implementing agency and data generators, this study further suggests an extensive study on the technical requirements of data generators in the public sector and the process of publishing for OGDI. A study that specifically focuses on exploring the country level challenges of implementing OGDI most specifically in developing economies will lead to a better understanding of the teething issues in OGD implementation. Therefore, future research should employ multiple case study on national OGDIs across developing countries. Additionally, future studies can review the effectiveness of each fit and viability factor to ascertain how it impacts on OGD implementation. Other theories can also be used in future research to unearth other pertinent characteristics related to the implementation of OGD to offer more generalizations to the findings of the study.

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APPENDICES

Appendix A: Interview Guides

INTERVIEW GUIDE FOR IMPLEMENTING AGENCY (NITA)

Introduction:

My name is Sulemana Abubakar, an MPhil student of the University of Ghana Business School Pursuing Management Information System (MIS). I am conducting a study on “**Towards a decade of open government data in Africa: A fit viability case analysis of Ghana**”.

Overview of the Research: Ghana signed on to the open government partnership with the aim of promoting transparency, empowering citizens, fighting corruption and harnessing new innovations. Later, the Ghana open data web portal (*data.gov.gh*) was launched in 2012 with the purpose of liberating government data for use, re-use and redistribution. The purpose of this study is to evaluate how task and technology fit requirements together with economic, IT infrastructure and organisational viability has impacted the overall performance of Ghana’s open data initiative (GODI).

This research therefore seeks to:

1. Determine the fit of the implementation of open government data in a developing economy.
2. Determine the viability of the Ghana open data initiative since its inception.
3. Determine the level of performance of the Ghana open data initiative over the period.

The interview questions are structured under the sections below. Thank you for your contribution to this study. Your responses will be duly appreciated and treated with utmost confidentiality.

Background of Respondent:

1. Please tell me about yourself, and the organisation (*Job Detail, Position, Role, Mission and Vision*)

PART A (*The following questions seek to investigate the task requirements that underpin the GODI implementation*)

1. When did Ghana decide to be part of the OGP project?
2. What precipitated the need to join the OGP?
3. What was the expectation/goal of Government of Ghana before joining the partnership?
4. To what extent have those expectations been met?
(*If yes, which ones have been met or have not been met?*)
5. Was there an existing data driven initiative as part of e-government structure or it was an entirely new initiative before the OGP initiative? (*if yes, what informed government the need to opt for Open Government Data initiative?*)
6. What are the functional and non-functional requirements of the system?
(*Consumer - Data CAT, search, download, visualized, machine-readable dataset. Publisher – add, edit, remove catalog. Administrator: Create, edit, retire metadata categories, data sorting, configure to meet global setting. Security, availability, accessibility, performance, reliability*)
7. What legal framework underpins the implementation of the GODI? *Is the initiative legally open?* (eg, ODC, ODbL)
8. How does the national data protection laws e.g. Data Protection Act, 2012 (Act 842) conflict with the open database license?
9. Is there any policy guideline on the implementation of the GODI?
(*If yes, is it being pursued? If no, why?*)
10. What are the data publishing standards to support the government open data initiative? (*Data audit, data selection, data protection laws & licensing, data standards, accessibility on the portal. Portal: data visualization, search, usability, multiple data format & download*)
11. Were all stakeholders well sensitized on the implementation of the initiative? (eg, MDA/MMDA, CSO, Academia)

PART B (*The following questions seek to investigate the technological requirement of GODI implementation*)

1. Did NITA have the technical competence prior to the implementation of the project?
(*If yes, probe the level of technical competence of NITA? If no, was there the need for training for staff before the project started?*)
2. Does the *current* technical staff have the skill-set to implement the project?

3. Do supporting agencies have the technical capacity to supply data as required by the initiative? *(if yes what is their level of competence?)*
4. How were the other agency staff trained on the requirement of the initiative?
- *(what form of training was given? Which category of staff, What role was assigned to them? In what capacity were they to serve in their respective agency? Were they trained on data security and integrity?)*
5. What are the procedures involved in the supply of data to NITA by the agencies? *(process, medium of data transfer)*
6. What are the measures put in place to ensure dataset are of quality and free of integrity issues?
7. How long does it take to publish data on to the portal, minute, day, etc.?
8. How often do users visit the site? *(No. of daily visit, daily download, number of uploads, etc.)*
9. How often do users apply for data besides what is available on the portal?
10. Which community of data users does the project seek to serve? *Eg. Planners, researchers, developers.*
11. Which type of dataset format do you provide for users?
12. Do users personally use the feedback session through personal or mail contact on the web portal?
13. How user friendly is the GODI web portal? *(search data, visualize, social media presence, suggest dataset, request for dataset, APIs, feedback, compatible with all web browsers, mobile devices, etc)*
14. Is the GODI webApp functional?
15. Is there the need for any special training for all technical staff of the initiative?
16. Have the technical requirements had an impact on its implementation?

PART C *(The following questions seek to understand the economic value of the GODI implementation)*

1. Do private organisations apply to publish their data or to be part of the initiative?
- If yes, what is the process involved? If no what could be the reason?
2. How does NITA implement its data value agenda out of the initiative? *(use re-use, redistribution, technology innovation, entrepreneurship)*
3. How often do users call NITA to ask for data that are not available on the platform?

PART D *(The following questions seek to understand how IT infrastructure factors shape the implementation of the GODI)*

1. What is the capacity level of NITA in terms of hardware and other related software for operating the system? *(secure servers, network/internet security, connectivity, hosting, upgrading, etc)*
2. What is the level of *maturity* of NITA in operating the hardware and related resources of the GODI? *(coordinating, controlling, monitoring and supervising)*
3. Does NITA have the data warehouse to keep data for the operation of the project?
4. What are the established data management policies and security? *(Data governance: data custodian, expect, steward, user, responsibility, quality, security, etc.)*
5. Why do some agencies resist to provide data to NITA?
6. To what extent does NITA manage resistance of data suppliers in the release of data?
7. To what extent is the maturity level of the NITA's infrastructure necessary for the implementation of the project?

PART E (*The following questions seek to understand how organisational readiness influences the implementation of the GODI*)

1. What is the current GODI management structure?
2. Do they have adequate knowledge of open government data initiatives as well as GODI?
3. How is GODI's management structured to support the implementation of the initiative? (*OD advocate, coordinator, authority, expert, manager, publisher, distributor, legal advisor, security advisor*)
4. To what extent is their readiness to commit resources to the initiative?
5. How often do top level managers meet with technical staff to assess the progress of the initiative?
6. Is the delay in the passage of the RTI bill affecting the progress of the project?
7. How often does management interact with the other stakeholders on the progress of the initiative?
8. Does management get feedbacks from the public concerning the implementation of the project?
9. How often does Government/Management appropriate adequate budgetary support and finance to maintain the project?
10. What is the level of maturity (*readiness/support*) of the current GODI's management necessary for the implementation of the project?
11. To what extent does the project impact (positive/negative) on the government and citizens at large?

FOR DATA SUPPLY AGENCIES)

1. Please tell me about yourself, and the organisation (*Job Detail, Position, Role, Mission and Vision*)

PART A: (*Task Requirements that underpin the GODI implementation*)

1. What are your views on Open Government Data?
2. For how long has your agency been part of open government data initiative?
3. Have your ministry had any engagement with NITA in respect of the Ghana open data initiative? (if yes, how was the engagement like?)
4. What was the Ministry's expectation in respect of OGD during the Ghana open data project implementation?
5. Have those expectations been met? (*Which ones have been met or have not been met?*)
6. Did the Ministry have any data driven initiative as part of e-government structure before the GODI?
7. Was the Ministry given any policy guideline to be able to make its data open to the public?
8. To what extent was MOFA sensitized on the implementation of the initiative?

PART B (*Technological Requirement of the implementation of the GODI*)

1. Who is in charge of coordinating open government data issues in your Ministry?
2. Which type of data does the Ministry generate most?
3. In what format do you mostly generate data? (*hard or soft, mode of storage? If soft which data format is mostly generated (.doc, CSV, Json, GeoJson, xml, etc.)*)
4. Does the current technical staff have the skill-set to collect and generate data in a machine-readable format such as CSV, XML, JSON, GeoJSON, etc?

5. Have your Ministry had any training on open government data by any organisation or agency? (*What form of training was it? Which category of staff were trained, what role was assigned to them? In what capacity were they to serve in the Ministry? Were they train on data security and integrity issues?*)
- *If no, is there the need for any training on the requirements of open government data?*
6. What are the procedures involved in the collection of data from the Ministry?
7. What were the measures you put in place to ensure dataset are of quality and free of integrity issues?
8. What are the challenges faced with respect to data collection and distribution?

PART C (*Economic Value of the GODI implementation*)

1. How do the datasets generated by the Ministry help in decision making?
2. Has the collection and use of data help the Ministry cut down on some administrative cost?
3. Does the Ministry place any value on the dataset supplied to other institutions or organisations?
4. Which agencies mostly publish your data on their data portals and why?
5. How often do data users apply directly to the Ministry for data which is not available on any online platform?
6. What is your relationship with software developers seeking to promote your Ministry through web technology?

PART D (*IT Infrastructure Factors shape the Implementation of the GODI*)

1. What is the capacity level of the Ministry in terms of hardware and other related software for data generating and storage? (*Server, internet connectivity, etc.*)
2. Were those resources provided by Government or through Donor agencies?
3. How does the Ministry coordinate the data gathering process?
4. What are the established data management policies (Data Governance) quality and security within the Ministry?
5. Does your Ministry sometimes resist supplying data to some other organisations or institutions?
6. In your opinion, to what extent is the maturity level of Ministry's infrastructure necessary for the implementation of the GODI?

PART E (*Organisational Readiness Influences the Implementation of the GODI*)

1. Does the Ministry have a management/administrative body responsible for the data management strategies? (*if yes, what is the structure? do they have the adequate knowledge on open government data initiative, is it well constituted?*)
2. To what extent is management readiness to committing resources to make the Ministry's data more open?
3. Has any individual or organisation had any data legal/security/privacy issues with the Ministry?
4. How often does *Government/Management* appropriate adequate budgetary support and finance to maintain the data infrastructure of the Ministry?
5. To what extent does open data impact (*positive/negative*) on the government, the Ministry and citizens at large?

KEY DATA USERS

Background of Respondent:

1. Please tell me about yourself, and the organisation (*Job Detail, Position, Role, Mission and Vision*)

PART A (*The Following Questions Seek to Investigate the Task Requirements That Underpins the GODI Implementation*)

1. Please what is your understanding of open government data?
2. Where do you normally get your data for your App development?
3. Do you use some data from government? (*if yes, which government agency/ministry*)
4. How do you get the data from these agencies?
5. What are the processes involved in getting the data from the MDAs? (*Application,*
6. What is the main reason why you visit the GODI web portal?
7. What are some of the existing e-government portals you get your data from besides GODI?
8. Were you given any policy guideline on the implementation of OGDI?
9. To what extent does the standard set out by NITA supports Ghana's open data initiative?
10. How did you get to know of GODI?
11. To what extent were all stakeholders sensitized?
12. To what extent does the National Data Protection Laws impact on your work?
13. How do think the task requirement of the initiative affect its performance?

PART B (*The following questions seek to investigate the technological requirement of the implementation of the GODI*)

1. How often does the organisation apply for data on the open data web portal?
2. Does your organisation get the required datasets for the purpose of executing your tasks from the portal or any other government agency?
3. How does the GODI web portal meet the criteria set for Open government partnership?
4. Do you believe the datasets published on the portal is of quality and free of integrity issues?
5. Has the organisation ever apply for data not available on the portal form NITA or the data supply agency? (*if yes please tell me how it was done*)
6. Which type of dataset format does your organisation frequently seek and why?
7. In what format is government data often delivered to you?
8. Have your organisation ever suggested any datasets or data format to NITA to be made available on the platform?
9. Please tell me how user friendly is the GODI web portal?
10. Is there the need for any special training for all technical staff in your organisation on the GODI?
11. Does the technical requirement of the project have an impact on its implementation?

PART C (*The following questions seek to understand the economic value of the GODI implementation*)

1. How often do you visit the open data web portal or apply directly to MDAs for data?
2. Which type of data does your organisation usually seek from MDAs or on the GODI web portal?

3. Does the data downloaded or given to you meet your desired goal as web developers in terms of quality and value?
4. How much does it cost to apply for data from the GODI portal?
5. In your opinion, what is the level of quality of data generated by data generators in government agencies?
6. To what extent does the project impact (*positive/negative*) on the work of the organisation and citizens at larger?
7. How fit is the GODI web portal for the purpose for which it was implemented?
8. To what extent does the project give the organisation and individual citizen's value?

PART D (*The following questions seek to understand how IT infrastructure factors shape the implementation of the GODI*)

1. What is the capacity level of the organisation in terms of hardware and other related software for participating in the system?
2. What is the level of maturity of the organisation in accessing the GODI resources?
3. What are the established data management policies and security?
4. To what extent does the organisation alleviate the resistance of data owners and other users?
5. To what extent is the maturity level of the organization's infrastructure necessary to participate in the project?

PART E (*The following questions seek to understand how organisational readiness influences the implementation of the GODI*)

1. Does the management of the organisation have adequate knowledge of open government data initiatives?
2. To what extent is their readiness to commit resources to the open data initiative?
3. How often does management interact with NITA on the implementation of the initiative?
4. Generally, how is data acquisition process in Ghana for application developers?
5. Do you use data from other African countries for your App development?
6. How easy it is to access government data?
7. Is the procedure for acquiring government data a challenge?
8. What are the major challenges faced by development firms in terms of data acquisition and use?

Closure:

1. Do you have any question to ask me or might want me to asks?
2. Do you have any general comment on OGD and GODI?
3. Are there additional documents (manuals, brochure, and flyers) that can provide me with further information?

Thank you for your time and participation. Your response would be transcribed and sent to you for clarification if needed before the final write-up.

Appendix B: Ghana's Letter of Intent to Join OGP



WA/PR/1

EMBASSY OF GHANA
3512 INTERNATIONAL DRIVE, N.W.
WASHINGTON, D.C. 20008

The Embassy of the Republic of Ghana presents its compliments to the United States Department of State, Office of Democracy and Global Affairs and has the honour to refer to the latter's invitation to the Government of Ghana to participate in the membership of the **OPEN GOVERNMENT PARTNERSHIP**, and wishes to inform that the Government of Ghana has in principle, accepted to join the Open Government Partnership alongside the United States, Brazil, Mexico, the United Kingdom, Philippines, South Africa, Indonesia and Norway.

The Embassy of the Republic of Ghana avails itself of this opportunity to renew to the United States Department of State, Office of Democracy and Global Affairs the assurances of its highest consideration.

Washington, DC
September 13, 2011

The United States Department of State
Office of Democracy and Global Affairs
Washington, DC




Appendix C: Request for Data Collection

1. Reply Mail from GODI Coordinator

← [Icons] 2 of 3 < > [Icons]

Open Data on Agriculture Inbox x [Icons]

 **Eric Akumiah** <eric.akumiah@gmail.com> Tue, Dec 4, 2018, 4:08 PM ☆ ↶ ⋮
to Simeon, me ▾

Hello Doc.,

Please e-meet Mr. Sulemana Abubakar who is doing a research on Open Data. He will like to meet you to find out more about open data on Agriculture.


Sulemana, please e-meet Dr. Salakpi who is Dep. Director ICT and National Coordinator of e-Agriculture Programme. He will give you the needed assistance with your project.

Best regards,
Eric

2. Request for an interview session (MOFA)

← [Icons] 1 of 1 < > [Icons]

Re: Open Data Research Inbox x [Icons]

 **Sulemana Bankuoru Egala** <sbankuoru@gmail.com> Dec 5, 2018, 12:13 PM ☆ ↶ ⋮
to vonsimster ▾

Good Afternoon Dr.


I am Sulemana the student Mr. Akumiah send you the mail in respect of a study on Open Government Data. Please Sir, may in know when it will be appropriate to meet you since it would be a one on one interview session. I have attached a copy of the interview guide for your study.

--
With Thanks

Sulemana, Abubakar

[Research Student \(MPhil Management Information Systems\),](#)
[Department of Operations and Management Information Systems,](#)
[University of Ghana Business School, Ghana](#)

3. Acknowledgment of audience granted to researcher

 **Eric Afful-Dadzie** <eaafful-dadzie@ug.edu.gh> Oct 30, 2018, 1:14 PM ☆ ↶ ⋮
to me ▾

Dear Mr. Akumiah,

I would like to say thank you for your cooperation and the support given to my student. We are grateful. I have been following the work of open government data Ghana since it became one of my research areas. I must say you are doing well in spite of the constraints.

I will be available anytime my service is needed to push forward the public data liberation agenda.

Find attached two of my recent publications in the area of OGD, while I also peruse your documents.

Regards,

[Dr. Eric Afful-Dadzie](#)
[OMIS Dept.](#)
[University of Ghana Business School](#)