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IMPACT OF SERVICE PROCESS IMPROVEMENT IN A PUBLIC-PRIVATE ORGANIZATIONAL ENVIRONMENT: CASE OF PURCHASING PROCESS OF PETROLEUM PRODUCTS IN LAGOS SEAPORT NIGERIA

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Author’s declaration of originality

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

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Abstract

Government and businesses around the world are in search of solutions to problems most especially at the austerity time when cost of producing and delivery services and new organizational models such as public-private partnership are being adopted in service production and provision as the roles of government in service provision are being reduced and ICT is seen as tool for service improvement and or redesign. However, less research has been focused on how to ensure service design meet the need of the stakeholders and ex-ante evaluation of service improvement effort most especially in developing economy such as Nigeria for eGovernment project stakeholders to decide if a proposed project will be impactful to the economy.

This research work focused on improvements of purchasing process of refined petroleum products in public-private partnership environment of Lagos seaport Nigeria with the aim for redesigning the service process for the benefit of stakeholders; public, private and citizens based on the theoretical concepts of service concepts, service design, service innovation and new public management governance models. Action design research methodology combined with in-depth interview and personal observation of qualitative data collection approach were used to analyse the existing process and design the ideal process, comparison of the simulation analyses of the existing and ideal processes revealed a drastic reduction in the processing time which is in line with expected benefits(economic and social) of the service improvement efforts based on stakeholders needs, however, the results showed that ICT is a supporting tool and not an end itself. Hence, the need for other forms of innovations such as organizational and social and also reorientation of the stakeholders for the full impact of the improvement effort to be maximized.

The thesis is written in English and contains 95 pages, 7 chapters and 12 tables.

List of abbreviations and terms

IT	Information Technology
ICT	Information and Communication Technology
PPP	Public-private partnership
NPA	Nigeria Port Authority
EFCC	Economic and Financial Crimes Commission
ICPC	Independent Corrupt Practices Commission
FMCT	Federal Ministry of Communication and Technology Nigeria
GIFMIS	Government Integrated Financial Management Information System
IPPIS	Integrated Payroll and Personnel Information System
ROI	Return on Investment
IHIP	Intangibility, Heterogeneity, Inseparability (simultaneity), and Perishability
NPM	New public management
PFIs	Private Finance Initiatives
TSA	Treasury Single Account
EIU	Economic Intelligent Unit Lagos State Ministry of economic and budget planning Nigeria
GS	GoSwift Software

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Chapter 1. Introduction

Nigeria is a vital maritime country in West Africa and has a coastline of 823 km with six seaport complexes to support commerce and international trade. Until 2005, the seaports and her operations were managed by Nigeria Ports Authority(NPA), but for improved performance and processes vis-a-vis reduction of road traffic and port congestion, the federal government of Nigeria adopted concession precisely public-private partnership model where NPA was saddled with the responsibilities such as land and property management and technical regulation of the ports (indirect roles) while the private terminals and oil depots operators manage business and cargo operations at the ports(direct roles) major cargo imported at the ports include refined petroleum refined products (wet cargo), bulk cargoes, finished products, machinery, oil tools and among others. Purchasing process of wet cargo Lagos seaport was at the center of this study because it accommodates over 70 per cent importation network in the country (Amajor, 2013 and Osunnuyi, 2015)

According to statistics, 60% of trucks visiting the Lagos seaport (oil depots in particular) farms are involved in more than 15days waiting time in physical queue, resulting in 3 billion hours loss yearly by residents owing to traffic congestion thereby leading to low productivity and high cost of logistics support for petroleum distributors and marketers in Nigeria among other negative effects such as air pollution, wasted energy, increased vehicular and road maintenance cost in Lagos and Nigeria at large(Olorunpomi, 2010 and Amajor, 2013).
Economic and Intelligent Unit (2013) summarized the impact of the current challenges at the seaport to include:

- 45% increase in Lagos city traffic due to long waiting times of trucks to pick up the product.
- Profit loss for transport companies due to trucks and drivers time wastage when in queue.
- Poor work and rest conditions for truck drivers due to lack of facilities.
- Loss of life and properties due to poor traffic safety and security.
- Bribery and corruption enhancement to survive the hurdles in the process.
- Garbage and pollution in the port area.

GoSwift Estonia is a software development company with expertise in queue management solutions for seaports and borders has initiated a discussion with Nigeria government to jointly provide a lasting solution to the long waiting time of trucks caused by the purchasing processes

of refined petroleum products at Lagos seaport. A similar case to the one under review was managed between the borders of Estonia and Russia, before implementation, vehicles were reported to wait on a physical queue for about six days, post implementation, the waiting time was reduced to 2hrs. This solution is believed to be scalable, and its implementation in Lagos ports promises to help reduce the traffic congestion and improving traffic flow at the port area thereby increasing trade and tourism activities of the Lagos and its environment (GoSwift, 2016).

This research's aimed at redesigning the existing wet cargo purchasing process using GoSwift IT Solution(GS) as one of the improvement tools and measure the possible impact of the improvement not only to the stakeholders involved in the process but also to the society at large.

This chapter gives general information about Nigeria, the rationale behind this work, insights on research hypotheses and questions, the relevance of this research to Nigeria and other stakeholders. It also gives insight into how this research work is arranged.

This chapter is divided into five sections; Section one talks about the statements of problems which give an overview of Nigeria in the area socio-economic index and how its impact on the general economic plan of the country vis-a-vis the public sector and most importantly the service delivery at the seaport which is the main focus of this research. This section is important for better understanding of the case under this study.

Section two focused on motivation for this research having learned the success stories of how the queues at Russia-Estonia border was managed using application information and communication technology (ICT) and also how Nigeria government agency applied ICT in their processes with a positive impact on the society. Section three discusses the central and general aims this study planned to achieve. Section four brings to light the key questions this study hope to answer and why answering them are important to the study objectives. The last section shed more light on the overall structure of this dissertation respectively.

1.1. Statement of problems

Nigeria is a federal constitutional republic comprising 36 states and its Federal Capital Territory, Abuja. According to World Bank ranking, it is the most populous country in Africa and the seventh most populous country in the world, with approximately 174,507,539 people as at July 2013 occupying an area of 923,768 km2 (Land 910,768 km2). Nigeria became independent from Britain as a colonial master on October 1, 1960. Post-independence, Military governments in

times of crisis have alternated with democratically elected governments until 1999 that a stable democracy returned to the country (The Commonwealth, 2013).To hasten her development post-military era, Nigeria has development plan titled, "Vision 20:2020" with the sole aim of being among the top 20 leading economy in 2020 and e-Government development ranking in the world and eventually help in the transformation of the country to a knowledge-based economy. Although various studies argued that the country is far from achieving this goal due to several factors with emphasis on socio-cultural factors (Federal Ministry of Communication and Technology, Nigeria (FMCT), 2012; Erhagbe, 2012; Nwangwu & Ononogbu, 2014; Agbodike & Ajah, 2014; Kalu-Nwiwu & Anyadike, 2015).

According to Fagbemi (2012) and Oseghale (2016), some of the factors hindering the achievement of development plan in developing nations are corruption, bureaucracy, over-bloated service, inadequate human and institutional capacities both in the private and public sector Nigeria seaport system at the central of this study is not an exception to the aforementioned challenges by Fagbemi.

Nigeria's seaport is a public-private partnership (PPP) system between Nigeria Port Authority (NPA), privately licensed depot and terminal owners, licensed public and private petroleum products marketers and other registered petroleum dealers. There are six ports in Nigeria, but this study is focused on the Lagos port because of the usual traffic congestion of the port axis of the city. The port process is divided into two sections based on the type of product distributed; the wet cargo section that is concerned with the distribution of refined petroleum products and the dry cargo section that is involved in the distribution of other goods apart from refined petroleum products. In details, this research would cover the scope of purchasing processes of the wet cargo section of the seaport. This system including the overall country systems was reported by scholars and journalists to as saddled with challenges such as bureaucracy, corruption, inefficiency, lack of transparency and the rippled effect of traffic congestion in the port city due to the long physical queue of trucks loading petroleum products from the oil depots. For instance, ROM Transportation Engineering, a Jerusalem-based firm in their study between 2007 and 2009 affirmed that Lagos (a seaport city in Nigeria) residents lose 3 billion hours to traffic congestion yearly with port purchasing activities as one of the major contributors to this menace.(Olorunpomi ,2010; Oghojafor et al.,2012; Erhagbe, 2012 and Amajor, 2013).

In addition to the challenges of the seaport mentioned above, Ogunsiji & Ogunsiji (2010); Jerome (2008) in Oghojafor et al. (2012) buttressed that the cause of the poor performance of

Nigerian Ports and other public enterprises from history tend to have a uniform pattern globally and range from the presence of conflicting and interwoven roles determined by politicians, prevalence of uncompleted contracts and subsidies from government.

However, governments and businesses around the globe are in search of solutions to the challenges pointed out by different authors above not only in the services rendered but also to the overall system of the government. (Polaine et al., 2013). Nigerian government in search for solution embarked on various public sectors reforms to help reduce opportunities and avenues of corruption in her system ; one of which was the establishment of institutions such as the Economic and Financial Crimes Commission (EFCC) and the Independent Corrupt Practices Commission (ICPC**),** Both agencies were launched to investigate and expose corruption, inefficiencies and waste in several areas of the Nigerian economy but other means apart from reforms need to be explored to proffer solutions the challenges of the country which is also peculiar to most developing nation (Fagbemi, 2012). Fagbemis call for more tools to tackle the challenges earlier mentioned apart from reforms could also be clear to Nigeria government as confirmed through this statement from one of the country's agencies that, "*The increasing globalization driven by ICT makes it imperative for Nigeria as an emerging market to irreversibly consider the application and promotion of ICT strategy to facilitate its rapid growth and development. This will involve the development of a vibrant ICT sector to drive and expand the national production frontiers in agriculture, manufacturing and service sectors. It would also require the application of the new knowledge to drive other soft sectors: governance, entertainments, public services, media sector, tourism, and etcetera"* FMCT (2012:11).

1.2 Motivation for Study

Following the above statement and section, one could deduce that Nigeria as a country has the goal of exploring the application of ICT for improved and better society. A recent case in Nigeria public sector was the adoption and implementation of public finance electronic platforms such as Treasury Single Account, Government Integrated Financial Management Information System (GIFMIS) and Integrated Payroll and Personnel Information System (IPPIS) in 2014. This implementation was reported to enable the removal of 62,893 ghost workers thereby saving the federal government of Nigeria N208.7 billion (approx. 416 million euros) as at February 2015 (NITDA, 2015).

Similar success story of ICT application for socio- economic development had been recorded in different nations but those most similar to the queue of trucks at the Nigeria Port process under review was recorded in Estonia, Lithuania and Russia border crossing by vehicles where virtual queue management service platform developed and managed by GoSwift limited (Estonian based software development company) was implemented under Public Private Partnership (PPP) model of organizational arrangement to ensure the easy flow of vehicles and goods at the border. This project was also reported to have resulted in a reduction of waiting time during border crossing of human and goods. Before implementation, vehicles were to queue for about six (6) days, post implementation, vehicles only have to queue for up to 2hrs (GoSwift, 2016).

The above success stories encouraged this study to how process improvement of purchasing process of wet cargo section of Lagos seaport can reduce the long waiting queue of trucks and reveal the possible impact of the improvement effort on the process stakeholders and the society at large most importantly after the introduction of virtual queue management software. Lagos seaport choice is due to the importance of the ports to the socio-economic development of the country, for example, Fivestar Logistics (2008) in Oghojafor **(**2012) cited that greater percentage of international trade in Nigeria is routed through the seaport together with 70% of all seaborne trade in the West African sub-region.

Also, this study wants to test Basant et al. (2006) in Bhatnagar & Singh (2010) and Otiento & Omwenga (2010) study that confirmed the firm-level impact of ICT in developing countries, especially in the private partnership service provisional service as shown in the current research.

1.3 Objectives of Study

This study was set to investigate the effects of applying ICT in a more complex service environment that involves both public and private stakeholders drawing from statement of Polaine (2013:36) that "*ICT needs to be seen as enabler in the quest for the delivery of quality, cost saving and efficient services in public and private sector considering the dynamism of the citizens or customers"*

This research proposed to apply information technology solution such as (GoSwift queue management solution) to redesign petroleum product purchasing process at the Nigeria seaport environment to improve the service user's experience and ultimately benefit other stakeholders involved in the service environment.

Also, this research was to guide how ICT is applied in various sectors of the economy most especially in service improvement to reduce negative impacts of corruption, bureaucracy, and foster increased transparency in public and private sector services. The result if achieved could serve as additional practice to support achievement the Nigeria national vision of 20:2020 of being among the top 20 leading economy and e-Government development ranking in the world and eventually help in the transformation of the country to knowledge-based economy.

This research aimed at building on the existing frameworks of Andersen (2007); Polaine et al.(2013) and Stickdorn M. & Schneider J., (2011) on how to design a service for the benefits of all stakeholders also propose how impact of service or process improvement efforts could be measured in and apply the same concept in a public- private partnership service delivery environment based on combination of existing eGovernment project impact assessment frameworks of Madon (2004); Otieno & Omwenga (2014); Osman et al. (2014) and Bhatnagar & Singh (2010 and to encourage stakeholders adopt e-Government and other best practices in service improvement).

In summary, this paper to assist policy-makers, state and government agencies (for example, the National Information Technology development Agency Nigeria (NITDA) responsible for coordinating national ICT strategies and implementation in the country to assess the impact of their e-government initiatives and justify funding for ongoing and future projects. The academia, civil society, donors and sponsors of e-government projects will also benefit from the new knowledge generated and giving justification for current or future funding of e-government services. It would also encourage the understanding and participation of private players like businesses (e.g. GoSwift Company as a solution provider) and citizens in service improvement projects.

1.4. Research questions

To achieve the above-stated objective**,** the current research paper seeks to answer the three main questions below:

- How to redesign service processes to meet stakeholders needs?
- How to measure effects of process redesign efforts in a service ecosystem?
- How service process improvement affects stakeholders in the public-private organizational arrangement?

The importance of the question "How to redesign services to meet stakeholders needs" is to identify the available service or process improvement methodologies that could be used to design good services in an environment that involve collaboration of publicn and private sector players for service delivery considering the major between public and private sectors, most especially in terms of market orientation and the end users. Hence, proposing a framework to help design good service is presumed to show "How to measure effects of process redesign efforts in a service ecosystem." This is important because private and public sector stakeholders have varied goals, needs, and expectations and if the improvement tools are not used to design a new model that answers most if not all the stakeholders' questions, then adoption rate of the new service might be poor.

The question of "How service process improvement affects stakeholders in the public-private organizational arrangement? If answered would give an insight into how process improvement efforts impact service stakeholders either economically, socially and environmentally. This if shown may encourage government and other stakeholders in service production and provision to have an either of return on investment (ROI) of adopting service design approaches**.**

The questions above if answered are to support the main aim of this paper to assist policy-makers, state and government agencies (for example, the National Information Technology development Agency Nigeria (NITDA) responsible for coordinating national ICT strategies and implementation in the country to assess the impact of their e-government initiatives and justify funding for ongoing and future projects. The academia, civil society, donors and sponsors of e-government projects will also benefit from the new knowledge generated and giving justification for current or future funding of e-government services. It would also encourage the understanding and participation of private players like businesses (e.g. GoSwift Company as a solution provider) and citizens in service improvement projects.

1.5. Structure of the study

This research paper contains seven main chapters. The first chapter gives general information about Nigeria with more concentration on its socio-economic status, port service, and rationale behind this work, research hypotheses and questions, the relevance of this research to Nigeria and other stakeholders.

The second chapter explores the relevance of theoretical concepts of service concept, public-private partnership model of service delivery and service design approach to the research topic.

The third chapter will discuss the works of scholars and authors on Nigeria port services, The role of ICT in economic development, why ICT projects fail with possible solutions and how impact eGovernment or service improvement projects are assessed around the globe and the possibility of adopting the practices in the case of this research work and other similar projects in developing economy such as Nigeria.

The fourth chapter explains research questions and research methodologies used in this research paper, with more concentration on why the research questions and the action design methodology action design methodology (ADR) was used, its advantages and limitations in answering the research questions under this study.

Chapter five presents detailed overview of the data from the twenty-one in-depth semi-structured interviews combined with process participants' observation that was carried out in March and April 2016 and present a new model of the existing model using Bizagi Modeler tool and compare the two model using simulation analysis.

Chapter Six will discuss the benefits of the newly proposed model over the existing model and ultimately discuss other findings about the research questions and hypotheses.

The last two chapters focused on the closing statements with recommendations to stakeholders how the new model can be implemented and insights for future research.

Chapter 2: Theoretical Concepts.

Introduction

This chapter concentrates on the relevance of theoretical concepts of services in terms of definitions, characteristics, how it is delivered in the public sector vis-a-vis various possible organizational arrangements in service delivery, governance, and public management models and how it helps answer the central research questions of this study, it also looked into service innovation in public and private domain with more emphasis on service design, business process reengineering and Six Sigma design approaches that enable ex-ante impact evaluation to be experimented in the case purchasing processes of refined petroleum products in Nigeria seaports, the concept of service delivery in public sector was also discussed to explain the changing role of government in the production and provision of public services.

The above concepts are of importance to the research as they give better understanding of what constitute services, although petroleum products as an object in the case under review is a physical good. However, purchasing processes of the petroleum products aggregate to service .. Service innovation concept will shed light on the importance of service design and e-Government as improvement methodologies as it relates to the topic of this research because one of the research questions is how to redesign services. Also in this current research, the concept of public, private partnership (PPP) is discussed to explain better the phenomena of collaboration between private and public sector players in service delivery in the case reviewed under the current study.

In essence, this chapter is to show how the above-mentioned concepts and their principles can be applied to improve service process and delivery especially in a public-private partnership organizational and subsequent impact assessment of the improvement made.

This chapter is divided into four sections; first is service discusses various perspectives about what constitute a service and service features, second section is service delivery in the public sector to explain how public services has evolved in terms of innovation in the organizational arrangements and also how the roles of the stakeholders involved in the service production and provision are changing , section three is centered on service improvement approaches that can be used to improve a service or service process and also enable ex-ante performance evaluation

while the last section summarize the concepts under this chapter and their relevance to research questions.

2.1. Overview of service

Producing definition of services is not as easy task because of several notions by different scholars (Van Looy et al., 2003). However, this research work would discuss service and its definition from three major perspectives; stakeholders relationship nature of services, different between products and services, and characteristics of services cecause of their relevance.

Viewing services difference from product, Quinn and Cagon, (1986); Gronroos, (1990); Kotler, (1997) in Van Looy et al, (2003) stated that services are activities in which primary output is neither a product nor a construction and that the activities or benefit offered by the service provider do not result in ownership of anything by the consumer. In essence, from the case under the current research service is not the petroleum products but the activities through which they are ordered and delivered to the dealers or users. Van Looy et al., (2003) supported the definition of Quinn and Cagon (1986); Gronroos (1990) & Kotler's (1999) definition of service describing that service could mean activities that facilitate tangible goods. One could say with the above definitions that service could mean process. Service as a process concept was discussed by Hammer and Champy (1993) through their definition of as a collection of activities that takes one or more kinds of input and creates an output that is of value to the customer simply put, some roles collaborating and interacting to achieve a goal. In a similar vein, Prasad (1999)defines a process as a set of 7-Ts (talents, tasks, teams, techniques, technology, time, tools) arranged in a particular manner so as to transform a set of inputs into a specified set of outputs (goods or services). Also, Andersen (2007) sees the process as logical series of related transactions that converts the input to results or output. These definitions of services as process or activities that facilitate product delivery support the notion of service in the current research where the activities or tasks of various stakeholders aid the eventual consumption of petroleum products in Nigeria.

Looking at service from the perspective of stakeholders' relationships, Polaine et al., (2013) defined service as the relationship between providers and customers which can comprise interactions among people, technology, and processes within and outside the service organization. This definition revealed that service is made up the relationship between stakeholders which could be grouped into two major categories; service providers and service

customers respectively; meaning that the interactions are between people. These interactions or relationships between people were further explained to take place in processes or activities, either within or outside the service provider or consumer environments.

In the environment where the service provider is public sector or government, Afolabi (1991) in Fagbemi (2012) defined service as a system made up of government and employees that serve members of the public through the provision of goods and services. In comparison with earlier the definition of Polaine et al. (2013), the government and the employees of government could be classified as service providers while the member of the public is classified as consumers. An example of services where government or her agents or employees are the service provider was elaborated further by Fagbemi (2012) either provided directly or indirectly by a government to its citizens. She emphasized that this may be offered directly by the government or contracted or through partnership. This situation where services are rendered through partnership is the main focus because of this research owing to the fact that purchasing of petroleum products in Nigeria seaport involves private and public sector organizations as service provider and also private businesses and even individual citizens More about the stakeholders, their roles and relationships as in the case under this study would be discussed in subsequent parts of this work.

2.1.1. Characteristics of service

Polaine et al., (2013) argued that applying the same mindset to designing services and products can lead to customer hostility rather than user-friendly results because service only creates value when used while products are discrete objects, In further effort to distinguish between products and services**,** various scholars and authors such as Sabine (2010); Van Looy et al.(2003); Lovelock and Gummesson (2004); Bowen(2000); Oresto & Makkula(2013) and Polaine et al.(2013) had written from the popular perspective of service features of intangibility, heterogeneity, inseparability (simultaneity), and perishability (IHIP)**.** These characteristics were argued to be valid and useful when related to an individual aspect of services instead of being assigned to services as a single entity (Sabine, 2010). Intangibility was criticized because there are usually many tangible objects in a service performance, although the processes of converting customer time, money and human resources are intangible embedded with tangible actions. For instance petroleum products in the case of service under review is a tangible embedded into an intangible purchasing process.

Also, Sabine (2010) and Van Looy et al. (2003) argued that heterogeneous nature of service to have contributed to the difficulty in measuring service quality this might be true in this research when considering impact assessments of improvement efforts on stakeholders due to their varied capacity for instance level of education, use of internet, and web platform among others. Hence, standardization of services becomes complicated and liable to fail to yield expected improvement results.

Lovelock and Gummesson (2004) in Sabine (2010) further argued that IHIP service characteristics to have been flawed by technological development. This was attributed to two reasons: one the focus of services marketing have changed, and the development of information and communication technology have advanced dramatically.

In essence, Bowen (2000) in Sabine (2010) argued that IHIP is true for personal or low-tech services or processes, following this argument, IHIP has more applicability to the existing purchasing process in the at the seaport, however, proposed introduction of high-tech tools such as interactive web platform such as that of GoSwift queue management system to connect the service providers and users in the ideal model of service process to be designed is presumed to make service characteristics of inseparability (simultaneity) less applicable as production and consumption of the ideal service process might be separated by space and time owing to reduction in human to human interactions using reservation system (GoSwift queue management system) with price discrimination as used by airlines (Sabine, 2010) if introduced to Nigeria port service environment might reduce the perishability of service providers capacity in the future, this can also cater for customer's resources perishability if managed with yield in terms of petroleum products and profit maximized with the introduction of ICT systems in the service as compared to the existing cumbersome processes.

In another perspective from IHIP services characteristics, Oresto and Makkula (2013) listed characteristics of good services to include an appeal to emotions, spark interest, feasible, usable, logical and intelligible, and easy to use. This could be a perspective to measure the impact of service or service process as pursued by one of the research questions. Heeks (2006b) and Polaine et al., (2013) proposed that the stakeholders' goals, needs and expectation factored in at the design stage to decide what to measure, in essence, service producers to recognize their customers (citizens and businesses) as a co-producer of the service(meaning changing roles of stakeholders in service ecosystem) More about the role of stakeholders most especially in public sector would be discussed in the sections below. Also proposed a solution of stakeholders needs

to be incorporated into the improvement stage to decide on needs or expectation the service should be assessed with will be explored using service design and design methods will be explored later in this chapter.

2.2. Service delivery approach in the Public sector

The section above pointed to the conclusion of Batley & Larbi (2004) that definitions, concepts, characteristics and even the delivery of service are changing, hence the approach of this study to find a different approach to how to redesign service and how the effects of redesigning efforts could be evaluated before implementation to aid stakeholders decision-making in investing or adopting new service in a public -private organizational service provision environment as in the case of purchasing process of petroleum products in Nigeria seaport examined under this research. In public services provision, Batley & Larbi argued that the role of government as the direct provider of services to citizens was changing and this has led to new organizational arrangement in the public sector for better delivery of services, hence came up with the two approaches to public services delivery; the first approach is direct provision where government construct, create, maintain and deliver a service to businesses and citizens. The second approach is indirect provision whereby public services are produced and delivered by private sector players and public sector agencies assume the role coordinating, regulating, standardizing, monitoring and enabling the private providers and also informing players.

According to World Bank (1997) & (2003) and Batley & Larbi (2004), government usually assume the indirect role in public services provision and delivery due to the fact that Weberian public administration approach formerly adopted by government that was diagnosed to be suffering from "bureaucratic pathologies" characterized by waste, inflexibility, impenetrability of hierarchy, rigidity of dense internal values and unresponsiveness to service users.

New public management (NPM) was seen as the management approach and market techniques to reform, modernize, and improve Weberian public administration, organization and management in government and the delivery of public service as public service users (citizens and businesses) are demanding for good governance characterized by good, efficient, cost-effective, transparent, accountable and responsive public service (Batley & Larbi, 2004; Lane, 2009; Michiel, 2016). For a better understanding of the concepts of public administration and NPM under discussion, evolution and, characteristics of the different forms of public sector

governance and management as formulated by Batley & Larbi (2004) are illustrated in the table overleaf:

Table 1: Innovation and improvement in different conceptions of governance and public management, pp. 29, Batley & Larbi (2004).

	Traditional public administration	New Public Management	Networked governance
Context	Stable.	Competitive.	Continuously changing.
Population	Homogeneous.	Atomized.	Diverse.
Needs/Problems	Straightforward, defined by professionals.	Wants expressed through the market.	Complex, volatile and prone to risk.
Strategy	State and producer-centered.	Market and customer centered.	Shaped by Society.
Governance through actors	Hierarchies, public servants.	Markets, purchasers and providers, clients and contractors.	Networks and partnerships, civic leadership.
Key concepts	Public goods.	Public choice.	Public value.

Despite the proponents of NPM for the government or public sector stated by Batley & Larbi(2004) to include rethinking and reshaping government and her agencies for improved service delivery and performance,

The third form of public sector governance and management; network governance is seen as the extension of NPM by Heeks (2002) evolved with the diffusion of ICT. Heeks describe this as eGovernment with its major difference from NPM as a model that uses information and communication technologies (ICTs) as a tool to support and transform the internal external workings of government by processing and communicating data instead of NPM model where information technology was used for automating only the internal workings of government by processing data. Ntiro (2000) in Heeks (2002) further explained that eGovernment encompasses all ICTs in all activities of the public sector with major innovation being computer networks Internet instead of intranets. According to Batley and Larbi, the major media of network governance are networks, partnerships and civic leadership with the sole aim of ensuring public value Batley & Larbi (2004) practical networks and partnership approaches adopted by government to ensure good governance and also meet demand from citizens and businesses mostly in the area of efficient and effective services provision and delivery based on the level of the private sector participation are represented in the table below:

Table 2. Public-private organizational arrangements. Source: Batley & Larbi, Public-private organizational arrangements (New York, Palgrave Macmillan, 2004 Box6.1

S/N	Forms of arrangement	Description	Types
1.	Pure public service delivery.	Government owns, finances and directly delivers services.	N/A
2.	Public ownership, partial private finance & operation.	Government owns and responsible for service provision while private support.	N/A
3.	Public ownership, some private finance & private operation.	Government owns, private production and provision of service.	-Lease: government covers investment cost, private finances operation of service from revenue. -Concession: private finances operation of service and investment costs from revenue. -Build-operate-transfer: private finances operation of service and investment costs from revenue. Retains ownership until the end of the contract.
4.	Private ownership, financing & operation.	Private owns, finances, production, and provision under government regulation.	-Monopoly of service by private owner. - Competition between governments licensed private owners. -Government financial support of private consumption & provision.
5.	Co-production	Joint production of services.	-Formal Joint venture. -Informal joint venture.

One important insight from the table 2 above is that production and provision of public services could be in three major forms; through the public agency, contracted to a private partner and

public-private partnership. Batley & Larbi argued that category of services and capacity of the service stakeholders need to be considered in determining the appropriate form(s) to adopt in a given service environment. The form of public-private organizational arrangement adopted at Nigeria seaport was public ownership, some private finance & private operation termed concession where the government owns the infrastructures but private sector handle production and provision of service.

The concession was described as public, private partnerships (PPPs) and Private Finance Initiatives (PFIs) and or seen as an arm of privatization if broadly defined. It gained popularity in recent times but is an old innovation as it was practiced by the French government as can be seen in the water project of 1776 Section 168 of the French government draft Ports and Harbor Authorities Bill defines a concession as an arrangement between an Authority and a third party pursuant to which such third party shall be authorized to provide a port service or operate a port facility in accordance with the bill It is argued that privatization of terminals through concession contracts would be a valuable option if port competition is effective, but not necessarily in cases where competition needs to be created by (Niekerk & Henriette,2005, Idornigie, 2006, Jerome,2008, in Oghojafor, 2012). This study opinion is that for a concession to be effective, standardization of service needs to be in place for instance in Nigeria port where the concession or PPP model at the port is criticized as ineffective.

Adopting market principles in government activities is an important feature of the new public management and privatization is one of its principal elements. (Batley & Larbi, 2004; Savas, 2005 and Michiel, 2016). The definition of privatization is muddled because there are numerous definitions with each focusing on one narrow aspect or managerial approach. Closely relevant to this study is seen privatization as the act of reducing the role of government or increasing the role of the private institutions of society in satisfying people's needs, it means relying more on the private sector and less on the government (Savas, 2005:2). This definition pointed out the fact that government is not completely cut out in privatization, Hence, PPP is addressed as a form of privatization or as a form new public management (NPM) organizational arrangement where government and a private entity, for-profit or nonprofit jointly perform or undertake a traditionally public activities, in essence, Savas further referred to PPP can be viewed as a tool of governance suitable for delegation where government retains responsibility and oversight but uses the private sector for service delivery. A similar organizational arrangement is seen in Lagos seaport where government licensed private sector players such as oil depot operators

together with Government Corporation, and other government agencies work as partners to deliver refined petroleum products to businesses and citizens.

Hartley (2005) elaborated more on of the changing role of government in production and provision of service earlier discussed by Batley and Larbi vis-a-vis the level of innovation and improvement each government model accommodate using the table shown overleaf.

Table 3. Innovation and improvement in different conceptions of governance and public management by Benington & Hartley in Hartley (2005) pp. 29.

	Traditional public management	New Public Management	Networked governance
Innovation	Some large scale national and universal innovations.	Innovations in organizational form more than content.	Innovation at both central and local levels.
Improvement	Large step Change improvements but less capability of for continuous improvement.	Improvement in managerial processes and systems. Customer focus produces quality improvements in some services.	Aiming for both transformational and continuous improvement in front-line services.
Role of policy-makers	Commanders.	Announcers/commissioners.	Leaders and interpreters.
Role of public managers	Clerks and Martyrs.	Efficiency and market maximizers.	Explorers.
Role of the population	Clients.	Customers.	Co-producers.

For the purpose of this study, attention would be given to improvement elements of networked governance shown in Table 3 i.e. improvement aiming for both transformational and continuous

improvement in front-line services owing to the fact that the study aim is to explore how services or service processes improvement effects can be determined before the new service is implemented only from the service providers perspectives but more from the perspective of service users and the society at large.

There are different scholarly perspectives on what innovation is about (Altschuler and Zegans, 1997; Mulgan and Albury, 2003 in Hartley, 2005). Relevant to this study is Hartley (2005) description of innovation viewed as a change that is expected to breed improvement adapted to another service context. Hartley further distinguished innovation either in public or private sectors into one or combination of product, service, process, position, strategic, governance or rhetorical innovation. This research would explore service innovation which is new ways in which services are provided to users, for example, exploring the effect of online queue management (GoSwift IT solution) as one of the improvement tools instead of traditional physical queue as currently the case of existing purchasing process with the objective predetermining the improvement efforts effects when redesigning services. Edvardsson et al., (2000); Haskett, (1986); Edvardsson & Olsson (1996) in Goldstein et al., (2002) that it is important to understand the service concept (the needs of the service stakeholders and how they can be satisfied) as this help in predetermining the how to measure the effects of service improvement efforts.

Lovelock et al., (1999) divided service concept phenomenon into two broad categories, one is service marketing concept (service benefits to customers) and secondly service operation concepts (how the services will be delivered). As further pointed out by Goldstein et al., (2002), using the service concept to make redesign decision helps designers and managers to be consistent and competitive in their service design. In support of the argument that service concept is a central component in designing services of Norling et al. (1992) and Stickdorn & Schneider (2011) added that service design is the holistic way for a business organization to gain an empathic understanding of service concept. This opens the discussion in the section below on service improvement methodologies that could help meet not only service customers' needs but also be used as redesign approach for meeting all service stakeholders needs in public-private partnership service environment exemplified by the case of a seaport under this study.

2.3 Service improvement approaches.

There have been various approaches to service improvement approaches that appreciate the understanding of service concept as a prerequisite to service redesign relevant to this study are those proposed Goldstein et al., (2002), Andersen (2007); Stickdorn & Schneider (2011) and Polaine et al., (2013). This section would analyze them and come up with reformulated by combining the k suitable elements applicable to the case of purchasing process of refined petroleum products in Nigeria port.

2.3.1. Service design

Sequel to the discussion in the previous section, service concept could be taken as a prerequisite for service design to be effective and enable impact assessment, many definitions have been given to service design concept, but the following are the one that is related to the current research. Polaine et al., (2013) viewed service design as an approach that deals with the study of how people experience a service (process) and further determine which parts are not joined up and make all perform well together as organizations. Polaine's definition, in essence, was supported by the statement of Oresto & Makkula (2013) who view service design as the application of established design process and skills to the development of services with the promises of ease of use, satisfaction, loyalty and efficiency to not only the users of service but also the providers. It was also seen as a design approach that helps develop and deliver great services, it improves factors like ease of use, satisfaction, loyalty, and efficiency right across areas such as environments, communications and products and not forgetting the people that deliver the service (Live/work, 2010 & Engine Service Design, 2010 in Stickdorn and Schneider,2011).

The above definitions can be summarized as explained by Polaine et al., (2013:22) "*Service design is important as it helps to make use of networks of services and people to simplify complex services and enables measurement of service performance to prove that service design result in more effective employment of resources (human, capital and natural) which still resonate with the service impact measurement of social, economic and environmental parameters. In essence, in service design, the challenge is to make the invisible visible or to make the right things visible and get rid of the noise in the rest of the offering."*

The above definitions are relevant to this research work as service design approach looks promising to proffer solution to the two (how to redesign services and impact measurement of service improvement efforts) research questions central to this study.

Katzan (2010) insightful solutions to the above questions revealed that Service design, on the other hand, is a process that specifically takes an abstract idea and turns it into a pragmatic reality by adhering to a well-defined set of steps or techniques as follows:

- Scoping the problem
- Analyzing the design parameters.
- Generation of feasible solutions, and
- Implementation of the selected option.

Polaine et al., (2013) in the same vein recommended the following steps when designing a service:

- Insight Research
- Workshops
- Service blueprinting
- Service proposition development
- Experience prototyping
- Testing
- Delivery

Going by Katzan and Polaine et al. recommendations, one could merge them for more understanding on how a service or service process should be designed to enable impact assessment. Below is the combined framework:

- Scoping problems by insight research and workshops
- Analyzing design parameters by service blueprinting
- Generation of feasible solutions by service proposition development
- Implementation of the selected option by combining experience prototyping, testing, and delivery.

In essence, Polaine et al. framework complements that of Katzan (2010) with necessarily providing details of the required tools to execute the steps listed.

Meroni and Sangiorgi (2011) summarized that there are four groups of tools required when dealing with service design, which was: analyzing tools, generating tools, developing tools and prototyping tools but this research will concretely apply the first three design tools. Customer journey map was adopted as analyzing tools for this study because it enables better understanding of the service stakeholders, their roles and relationships, while brainstorming technique was used as generating tools because it allows shared meaning of collected experiences through direct conversations with the service stakeholders and service process

modelling was adopted as developing tools because it allowed exploration of all service processes and made evaluation feasible through simulation.(Meroni & Sangiorgi, 2011; Stickdorn & Schneider, 2011and Polaine et al., 2013). Further details of why and how these design tools were applied in the current research would be seen in Chapter four and five respectively.

Another service design approach relevant to this study was business process reengineering (BPR) which was defined by its advocates Hammer and Champy (1993) as the "*fundamental rethinking and radical redesign of business processes to achieve dramatic improvement in critical contemporary measures of performance such as cost, quality, service and speed"* (Andersen, 2007:36). Other scholars have different perspective about this approach, for example Peppard and Rowland (1995) in Andersen (2007) stated that BPR is an improvement philosophy that aims to achieve step improvements in performance by redesigning the processes through which an organization operates, it was further divided process reengineering into either systematic or clean slate which Carr and Johansson (1995) in Boudreau and Robey (1996) classified into incremental and orthodox reengineering. Critics such as Davenport (1995) in Boudreau and Robey (1996) argued that clean slate approach is fallacious as it is unrealistic because the redesigned business processes need to be implemented in real organization and it is almost impossible for members of organizations to obliterate the shared understandings and mental models that have accrued over time because existing bottlenecks need to be considered before designing a new one. This research also doubts if clean slate BPR is applicable in the real world, most especially in a multi-organizational environment of the seaport process under review. Other critics further that that clean slate approach cost is unbearable (Robey et.al, 1995 & Grint et al., 1996 in Andersen, 2007 and Rezgui, 2000). Hence, the consideration of adopting the best parts of systematic BPR as it is applicable to this research. Systematic BPR approach favors four steps of planning, reengineering, transformation and implementation. The major gap in this approach is lack of evaluation phase that is required for the impact assessment questions of this research In order to bridge the gaps of evaluation identified in the BPR methodologies above, three European construction companies introduced CONDOR and RADIE BPR methodologies evaluation and continuous improvement and also to also foster cost-effectiveness not only in the construction industry where it emanated from but also in any other industry of choice. These methodologies are represented in five stages: recognition, fundamental analysis, radical redesign, implementation and evaluation (Rezgui, 2000). CONDOR and RADIE BPR methodologies supported post implementation evaluation. However, this paper seeks to develop a framework for ex-ante evaluation which CANDOR and RADIE approach of BPR had not

resolved. A service design methodology that caters for the ex-ante evaluation that CANDOR and RADIE BPR methodology failed to address is Six Sigma, which was reported to have its root from Motorola in the mid-1980S as parts per million (ppm) defect rates measurement in the electronic and automotive industries to define product quality level. The process improvement concept outlined in Six Sigma concept is the DMAIC (define, measure, analyze, improve and control) process (Andersen, 2007).

Furthermore, Chowdhury (2002) in Cudney & Furterer (2012) Proposed Design for Six Sigma (DFSS) instead of traditional DMAIC process because of its flexibility. In essence, DFSS methodology can be DMADV (Design-Measure-Analyze-Design- Validate), IDDOV (Identify/Define-Design-Optimize-Validate), IDOV (Identify-Design-Optimize-Validate) or DMADOV (Design-Measure-Analyze-Design- Optimize-Verify. For the purpose of this research, IDDOV design process would be used owing to its suitability to work well in redesigning existing process or service as it is in the case under this study without being constrained by the existing process. This study included less of optimization and validation phases because the objective was to redesign and conduct an ex-ante evaluation of ordering and delivery processes of wet cargo at the Nigeria seaport.

The following table shows the objectives, activities and possible design tools of the phases.

Table 4. IDDOV roadmap, Adapted from Cudney & Furterer 2012, pp. 5-43.

Phase/ Parameters	Identify	Define	Design	Optimize	Validate
Objective(s)	To define the business problem or opportunity	To understand critical needs of stakeholders.	To understand the elements of the process to ensure stakeholders ' needs are met.	To understand the elements of the critical satisfaction characteristics are met to pilot or prototype the new process.	To validate the process. Access performance, failure modes, and risks and iterate until the new process are stabilized.
Activities	Develop project charter. Perform stakeholder analysis. Develop project plan.	Collect voice of customers. Identify critical to satisfaction measures and targets. Translate stakeholders' needs to technical requirements.	Identify process elements. Design process. Identify potential risks and inefficiencies.	Implement pilot process. Assess processes capabilities. Optimize design.	Validate process. Assess performance, failures, and risks. Iterate design and finalize.

2.4. Summary

Providing definition of services is not an easy task because there are several notions regarding service definition. The most relevant to this study is the definition that state that: service are activities or processes that facilitate tangible goods and made up relationship between service providers and customers, and that: service comprises of interactions among people, technology and processes within and outside the service organization (either private or public sector) (Kotler, 1997; Van Looy et al., 2003; Fagbemi, 2012 & Polaine et al., 2013).

An interesting discussion raised by Batley & Larbi (2004) was the changing role of the service stakeholders, for instance in the case under review in this study where public sector stakeholders assume the indirect role and delegate the direct role to the private players in the form of public-private organizational arrangements for service production and provision. In the case of ordering and delivery of petroleum products under review, the government has already has embarked on governance innovation but not all innovation as supported by Hartley (2005) brings about improvement, the essence of this research is to drive process, strategic and service innovation in the case under review using governance and public management models of NPM and network governance with GoSwift queue management solution as of the ICT tools.

The central question central to this research work then is how to implement the good service processes of Oresto & Makkula (2013) under the complex organizational models considering the criticism of the inseparability, heterogeneity, intangibility and perishability nature of some aspects or types of services most especially when element of information and communication technology (ICT) is applied as improvement tools and simultaneously evaluate the improvement efforts. Polaine et al, (2013) proposed "*Service design approach as the solution the questions raised in the above paragraph as it helps to make use of networks of services and people to simplify complex services and enables measurement of service performance to prove that service design result in more effective employment of resources (human, capital and natural) which still resonate with the service impact measurement of social, economic and environmental parameters. In essence, in service design, the challenge is to make the invisible visible or to make the right things visible and get rid of the noise in the rest of the offering."*

Service design approach is seen to be broad with different methodologies to improve service or service processes. Related to this study are business processes reengineering and Six Sigma methodologies respectively, various scholars and authors such as Rezgui (2000); Andersen

(2007); Katzan (2010); Meroni & Sangiorgi (2011); Polaine et al., (2013) have different models to business process reengineering, some such as Andersen (2007); Katzan (2010); Meroni & Sangiorgi (2011); and Polaine et al. (2013) excluded evaluation stage which is paramount to the achieve the objective of this study while Rezgui (2000) CANDOR and RADIE BPR methodology included evaluation post implementation of service or process, this also contradicts the aim of ex-ante evaluation this study aimed at achieving. Solutions to this theoretical gap using six sigma methodologies were seen in Andersen (2007) and Cudney & Furterer (2012). Therefore, Cudney & Furterer (2012) IDDOV design process/ framework as seen in table 4 when combined with service improvement tools promises to be more applicable to the case under this study.

Further application of the Cudney & Furterer (2012) IDDOV model to this research would be shown and discussed in the next chapters to answer the question of how to redesign a service process and ensure required improvements to the case under study in this research work.

Chapter 3: Literature Review.

Introduction

This chapter discusses further what had been done in the field of the current research topic most especially based on the works of different scholars. The chapter is divided into five major sections, the first chapter discusses the current situation of the Nigeria seaport which is the chosen case under this study, this chapter presents the challenges associated with the port processes and their impact on the economy and the society at large, solutions to the identified challenges were also discussed as proposed by different authors and scholars, of importance to the current research work was the proposition of ICT as a tool and key enabler to deal with the service process challenges of the seaport.

The second section discusses further on the role of ICT most especially in the area of economic development; this section is important to enlighten on the global contribution of ICT to the economy and also that of the local territory of Nigeria as it relates to this study. The third section discusses various factors that contribute to the failure of ICT projects most especially eGovernment projects and proposes various solutions to reduce the failure rate. Section four discusses one of the assumptions of the current research work that inadequate eGovernment projects evaluation methodologies is one of the major cause of its failure. This section is divided into two subsections; subsection one give insights on the hypothesis through the analysis of various scholars and authors perspectives on eGovernment projects evaluation while the last subsection analyzes various eGovernment assessment frameworks in order to answer the questions of how to evaluate impact of service process improvement efforts in a multi-organizational settings as seen in this study. The last section gives conclusive statements that prepared us for the choice of research methodology adopted in the current research.

3.1. Challenges facing Nigeria port and the possible solutions

Despite the importance of seaport to national economy discussed in the previous chapter, Nigeria seaport was reported to face challenges of poor performance due to lack of adequate infrastructures and collection of illegal fees which impede business operations and adds to the cost of doing business. For instance, an account given by Francis Omotosho of Association of Nigeria Licensed Customs Agents (ANLCA) to Vanguard newspaper says**:** **"***Shipping agents*

Presently collects about seven illegal charges from port users, waterfront terminal operators collect about 11 charges on every container while their counterpart in the off dock operation (bonded terminals) collect about 20 different charges…" (Bivbere, 2011, p. 29 in Oghojafor et al., 2012). Apart from overcharges at the port, other factors such as corruption, bureaucracy, inefficiency have been problems hindering the performance of the seaport and it processes to full capacity. The purchasing process was reported to be one of the major causes of traffic congestion in a port city of Lagos Nigeria. (Amajor, 2103 and Osunnuyi, 2015) Another school of thought viewed the traffic congestion to be attributed to factors such as indiscipline and ignorance on the part of road users, limited road capacity, presence of broken down vehicles especially on busy roads, improper parking, street trading as well as absence of weigh bridges, improper use of transport infrastructure, proliferation of interstate major parks, activities of touts among others and concluded that Lagos residents lose 3billions hours to traffic congestion yearly with the claim that 20% reduction of wasted time due to traffic congestion would save the state of Lagos a sum of $1billion.(Olorunpomi, 2010).

A proposed solution by the Corps Marshal and Chief Executive of Federal Road Safety Corps (FRSC) of Nigeria, Boboye Oyeyemi in a conference on solutions to traffic congestion in Nigeria was diversification of means of transportation to most especially rail and water instead of over dependent on road as 90 percent of transportation system in the country today is by road (Osuntuyi, 2015). Olorunpomi, 2010 and The Economic Intelligent Unit of Lagos state ministry of economic planning and budget, (2013) argued that combination of institutional and infrastructural solutions would work better for example deployment of solutions such as use of state agency for traffic matters on the road, traffic light, and signs, road expansion, education of road users. Despite the fact that the Lagos state government had recently adopted most of the above recommendations, the challenges are still reported to be in the face of residents. (The Economic Intelligent Unit of Lagos state ministry of economic planning and budget; EIU, (2013).

A similar case to the current situation and problem of Nigeria port was recorded in Estonia, Lithuania and Russia border, where queue management service platform developed and managed by GoSwift limited (Estonian based software Development Company) was implemented to proffer solution under Public Private Partnership (PPP) model of organizational arrangement. This project was reported to have resulted in a reduction of waiting time during border crossing of human and goods. Before implementation, vehicles were reported to queue for about six days, post implementation, vehicles only have to queue for up to 2hrs. Also, the project was known to

have a drastic impact socially, economically and environmentally even to the country's image if one considers other profitable activities visitors could use previously wasted waiting time foto enjoy. (GoSwift, 2016).

This research seeks to analyze the purchasing process of the Nigeria port, identify the bottlenecks and redesign the process adopting IT solution such as the queue management system implemented in the case of Estonia could be introduced in Nigeria case as one of the improvement tools. This notion of IT as an enabler was supported by Elebeke (2009) who acknowledged ICT as a tool for good governance to combat corruption and bribery menaces of Nigeria seaport. This argument was further strengthened by FMCT, 2012 statement that, "*The increasing globalization driven by ICT makes it imperative for Nigeria as an emerging market to irreversibly consider the application and promotion of ICT strategy to facilitate its rapid growth and development. This will involve the development of a vibrant ICT sector to drive and expand the national production frontiers in agriculture, manufacturing and service sectors. It would also require the application of the new knowledge to drive other soft sectors: governance, entertainments, public services, media sector, tourism, and etcetera". (FMCT*, 2012:11).
Therefore, the section below would explore the possible role of ICT most especially about national development and service or process improvements with a special focus on public sector and developing economies such as Nigeria to proffer possible solutions as applicable to this research work.

3.2. ICT and Its role in economic development

According to Steinberg (2003)**,** the advent of the global information technology revolution in the 1990s set off a heated, sometimes acrimonious debate among development specialists and policymakers about the place of ICT in development. This debate subsequently subsided as it was widely believed that information technology and communication has an important role to play in national development. As a result government of several developing countries have made significant investments in ICT and have come to view it as an important contributor to industrialization and economic development. ICT role in the concept of economic development could be categorized into two; one is as commodity if looked at from the components of

hardware and software, second as a tool or driver of the economy due to its application for improved productivity and quality in a number of sectors such as agriculture, manufacturing, infrastructure, public administration and services such as finance, trade, distribution, marketing, education and health. Hence, ICT has become a critical infrastructure for competing in an information-intensive global economy. Avgerou in Korpela et al., (2003) explain the role of technology in line Steinberg (2003); Maung & Harindranath (2004) and Heeks (2005) that technological innovation enhances human capabilities such as a healthy life, knowledge, creativity, and participation in the social, economic, and political life of a community – and impacts on economic growth through productivity gains but also emphasized that human capabilities are an important means of achieving technological innovation. Therefore, one could say that technology may be a reward human development and or a tool for human development. This research will concentrate more on the perspective that technology is a tool for, not just a reward of growth and development due to its relevance to the case under review and overall study objectives

Although Steinberg (2003) claimed that before the arrival of the internet, modern ICT began to have an impact in some developing countries. For instance in Brazil, the computer industry was reported to account for more than 74,000 jobs and $4 billion in revenue by 1990. Also in India, the launching of a set of policies that fostered a software-development industry whose exports grew to $5.7 billion within 1999-2000 was reported in 1988. Also, the experience of Estonia, which sought to overcome its lack of natural resources and outdated manufacturing sector by embracing an all-encompassing strategy of promoting ICT throughout its society and economy is an example of ICT's potential. The same positive impact was noted in rural China where access to telephones helped further our understanding of the ways in which ICT can contribute to overall development.

Nigeria acknowledging ICT to be one of the most critical tools underpinning socio-economic development in the 21st century globally and as critical to lend support to other Sectors of the country economy in terms of efficiency, productivity and transparency, thus aiding job creation, better governance and overall socio-economic development, Ministry of Communication Technology was established to ensure better coordination of ICT activities and development in Nigeria. Subsequently, developed and launched national ICT policy in 2012.This National ICT Policy lays out the inputs required to strengthen all productive sectors and ultimately transform Nigeria into a knowledge-based, and globally competitive country, in alignment with the National Vision 20:20 objectives. The main objective of the National ICT Policy is to provide a

comprehensive framework for the ICT sector which encourages investment, enables the rapid expansion of ICT networks and services that are accessible to all at reasonable costs, strengthens all productive sectors, and facilitates the transformation to a knowledge-based economy **(***FMCT, 2012).* A popular impact of applying ICT recorded in Nigeria was that of public finance electronic platforms called Treasury Single Account, Government Integrated Financial Management Information System(GIFMIS) and Integrated Payroll and Personnel Information System(IPPIS). That were reported to enable the removal of 62,893 ghost workers, saving the federal government of Nigeria N208.7 billion (approximately 406 million Euro) after one year of implementation (NITDA, 2011 & 2015).

3.3. Why ICT projects fail.

In another perspective from the successes of eGovernment or ICT projects mentioned in the last session which sum up ICT as a key enabler for development, scholars such as Boudreau and Robey(1996);Bergeron & Limayem(1995) in Rezgui(2000); Heek(2006) & Yildiz (2007) argued that the positive effects of ICT projects efforts are not easily achieved they affirmed that there were between 20-30% failure in project re-engineering projects in different environments. For example Cafasso (1993) in Boudreau and Robey (1996) revealed that 25% of BPR project fails while Hayley et al., (1993) in Boudreau and Robey(1996) through research of Deloitte and Touch in 1993 reported another figure of 50% failure using quality, cost reduction and competitiveness as measurement criteria. In the same vein, Heek, (2006) stated that 70-85% of e-Government projects in developing nations fail.

One clear fact was the contradiction of the failure rate of ICT projects given by the scholars, Boudreau and Robey (1996) and Kumar & Best (2006) attributed the contradictions above to varied conception/methods of BPR and unclear methods of an impact evaluation of BPR concept. This research believes that ICT projects are not properly evaluated, this could be the reason for the contradiction in their failure rates, and this view was supported by Boudreau and Robey (1996) and Heek (2006). This study intends to propose how to evaluate ICT projects most especially in a PPP service environment. In an attempt to answer the question of why ICT projects fail, different answers and perspectives had been presented by different authors based on the kind of projects they were involved in. For the purpose of this study, the discussion would be on the projects in both private and public sectors because both private and public sectors players are stakeholders in the service process under review in the current work.

Yildiz (2007) supported Boudreau and Robey(1996) claim stating that the concepts of eGovernment is limited in some ways: one of their argument was that the concept lacks standard definition, because different authors or scholars or organizations view e-Government from different perspectives. In line with this research, this could be a failure factor as it is possible to muddle up different ICT concepts. For example BPR and eGovernment, though seen as different concepts by many authors but with the same proponents.

Urikovi & Kovacevi, (2008) attributed the failures to planning and implementation as most ICT projects lead to delays and cost overruns, they concluded that problems encountered in the implementation phase are more of a rule than the exception. They further consider rapid technological changes, privacy, and security, digital divide as an additional factor. Most applicable to this research work is the technological changes and digital divide, for example a developing nation like Nigeria where majority have little or no access to IT infrastructures like data and the internet, this divide if not considered at the planning phase of the project mighty exclude some stakeholders from participating actively in the service or her process. In essence, If not managed properly, the inability to provide online services to all citizens can stop eGovernment projects.

Heeks (2006) and Kumar & Best (2006) looked differently at why ICT projects like eGovernment project fail mostly in developing nation as organizational such as lack of adequately trained personnel, lack of sustained public leadership commitment and Institutionalization shift in existing power relationships, lack of consistent evaluation and monitoring and lack of involvement of all stakeholders as a result of their separate research in Africa and ICT kiosks implementation in Indi**a.** This view could be seen from a broader context of both developed and developing countries such as Nigeria; these are also potential threats to the success of projects even beyond ICT. For instance, public sector stakeholders support might change due to political instability or in another form, due to lack of interest in the project.

In a separate study by Heeks(2006b) also affirmed technological and legal infrastructures as key to success of ICT projects, for example digital signature initiative in Estonia might have difficulty being successful with the technological backing of the eID and mobile ID infrastructures backed by digital signature law that defines what digital signature is and its acceptability in place of traditional signature. Heeks also categorized the possible failures in eGovernment projects into three: *partial failure* of an initiative in which major goals, *zero-sum failure* of an initiative that succeeds for one stakeholder group but fails for another are unattained

or in which there are significant undesirable outcomes and *total failure* of an initiative never implemented or in which a new system is implemented but immediately abandoned.

A summary of why ICT projects fail could be given as supported by Aladwani (2013a) to include individual, organizational structure and culture, legal, technological, social and political. Corruption was also affirmed to be an important factor influencing success and maturity of e-Government projects (Sigh, 2007 in Aladwani, 2016).
eGovernment projects failure factors by the various authors in this session are not disputed by this research, otherwise, they are embraced to serve as a base to plan service improvement projects that are ICT based as would be seen in the improvement efforts of the case in this research and also to help stakeholders involved to identify the likely failures factors and or risks and mitigate such before and during the course of the project as researchers such as Heeks (2002) and Cain (2001) in Heeks (2006) and Adeyemo(2011) confirmed high rate of ICT or eGovernment projects underperformance or failure in Africa than other continents.

This research would look at the causative agents of e-Government or ICT projects failure from a different perspective from many of scholars above with the opinion that project design and project impact measurement approach employed in the course of planning and executing a project could affect success rate as opined by Boudreau and Robey (1996). Hence, the main question about this research on how to design "good" services most especially existing ones as in the case study in this study and how to measure redesign efforts respectively.

3.4. Evaluation of eGovernment efforts

Henry (2006) in his survey on the popularity of digital governance in America concluded that e-government could make governments more accountable and have a positive impact on both citizens and public administrators. The impact of e-government was further elaborated to include improved decision making, more intensive and productive use of databases, better communications, improved public service delivery and that it has become a critical tools for achieving good and people oriented governance as it promotes transparency, accountability and efficiency in government (Henry, 2006 and Okwueze, 2010). The term impact in itself could mean many things, and the accepted definition is based on context and school of thoughts. For this study, would be seen from the perspective of Roche (1999) and Otieno & Omwenga **(**2014**)** as sustained and lasting changes (direct or indirect) in government, businesses and citizens' lives brought about by a particular intervention, project or program.

According to Otieno & Omwenga (2014), eGovernment projects such as service process improvement with the intervention of ICT as seen under this study has emerged as one of the innovative ways of providing information and delivering services to citizens and businesses. With the promises of providing governments with new opportunities of bringing services closer to the citizen in cost-effective, efficient and transparent ways. Therefore assessment of impact is important to justify public fund expenditure and also private sectors and citizen participation in eGovernment projects. This supports the main aim of this paper to assist policy-makers, state and government agencies (such as NITDA in Nigeria responsible for coordinating ICT strategies and implementation in the country) in developing countries to enhance the impact of their e-government initiatives and justify funding for ongoing and future projects. The academia, civil society, donors and sponsors of e-government projects will also benefit from the new knowledge generated and giving justification for current or future funding of e-government services. It would also encourage the understanding and participation of private players like businesses and citizens.

In spite of the implementation of e-government, there is little research that has been conducted in the context of developing countries to benchmark and appraise the impact of e-government on the target groups. Most studies on assessment of e-government have been done in developed countries where the context is different from that of developing countries (Otieno & Omwenga, 2014). Hence, the analysis of this session would be more in the works of scholars in developed economy. This study believes that there is need to develop evaluation frameworks for eGovernment or service process improvement done with the aid of ICT in the context of developing countries. Thus, in the following session, an analysis of various proposed eGovernment assessment frameworks with the aim of identifying, using and recommending the adoption of a framework that is suitable in the context of a developing country most especially in a public-private partnership service delivery models as seen in the case study of this research work would be explored.

3.4.1. eGovernment projects' impact assessment frameworks

When evaluating the impact of e-government, it is worth noting that there are different stakeholders (citizens, government agencies, businesses and society at large). In the assessment of the impact of e-government, most researchers are tempted to apply methodologies that

emphasize on technological or economic value as viewed from the agency or private sector perspective (Alshawi & Alalwany, 2009 and Liu et al., 2008).

Otieno & Omwenga (2014) argued technological value is derived from how well technology makes information and services accessible, reliable and usable. Therefore, it is imperative to note that while private enterprises are driven by the motivation to make a profit (economic value); government agencies are driven by public (social) value, which is the need to serve the public. For the case under review, the both economic and social value are necessary because the service involved is delivered under public- private partnership (PPP) organizational environment. In essence, the proposed evaluation framework for this study would take into consideration not only the public value of the service to the citizens but also the economic value which is one of the business goals in a private enterprise. Moreover, owing to gap in literature in evaluation in the context of PPP, concentration would be on how to adopt best practices from available eGovernment evaluation models that are suitable for this research.

A group of scholars argued that though there are many eGovernment evaluation frameworks that have been developed and used before, most of them concentrate on e-readiness, maturity levels, web metrics and front office supply-side (agency-side) but ignore demand side (Codagnone and Undheim, 2008; Bhatnagar &Singh, 2010; and Verdegem et al., 2010).

Verdegem et al. (2010) and Bhatnagar & Singh (2010) opined that there should be more concentration on a citizen-centered approach, which reflects the effectiveness of eGovernment services.

Literature revealed that available eGovernment assessment frameworks could be grouped based on approach (regarding contexts, pre or post implementation of projects), a focus group of impact measurement (e.g. supply side, demand side, and outcome impact). This study would adopt frameworks that are applicable in the pre-implementation stage of projects and outcome impact which combine demand side and supply side because the case study under review has not been implemented and also to be more citizen-centered in impact assessment approach.

Demand side driven assessments frameworks formulated by Wang and Liao, 2008 focused on six key dimensions: information quality, system quality, service quality, use, user Satisfaction, and perceived net benefit using data collected from surveys to measure the success of G2C Information Systems. The measurement criteria are not fully representative of eGovernment concepts and models of G2B and G2G. Also this study believes that surveys using a

questionnaire to gather are subject to bias. Hence, the combination of unstructured in-depth interview with personal observations as would be seen in the methodology chapter. The framework was used for ex-post evaluation as opposed to the ex-ante evaluation proposed in under the current work

Supply Side driven assessments frameworks of Victor et al.,(2007) and MAREVA (A Method of Analysis and Value Enhancement), developed by the French Electronic Administration Development Agency (ADAE) and Bearing Point(2005) also designed for post-implementation audit on IS project management as done by Wang and Liao (2008) with special focus on the government agency gain and costs without considering other stakeholders, the strength of MAREVA frameworks compared to the demand-sides driven frameworks earlier analyzed was ability to calculate expected return on investment (ROI) before a project is taken up as opposed to Victor et al.,(2007) post-implementation method of evaluation and also benefits to employees and society, and concrete clients. The specific indicators to be measured were not clearly stated. Codagnone and Undheim (2008) further criticized supply-sides driven eGovernment evaluation framework with the argument that the relevance and validity of pure supply-side evaluations are questionable and some critics question their validity because eGovernment projects are driven by public value rather than technological and economic value. It might be therefore imperative to adopt frameworks that emphasize a citizen-centric or demand-side approach to ensure that citizens and businesses get value for money. Therefore, when assessing eGovernment impact, it is important to consider the context of implementation and impact from not only the government angle but also other users (businesses and citizens) perspective because they are key stakeholders. (Fitsilis et al. 2007, Liu et al., 2008, and Heeks 2006b in Otieno & Omwenga, 2014**).**

To strike a balance between supply-side and demand-sides eGovernment projects impact evaluation frameworks, outcome-impact evaluation frameworks were formulated that take into consideration the social and economic impact of eGovernment projects about stakeholders either government, citizens or businesses and the overall society. For example, Federal Ministry of the Interior, Germany, 2004 developed WiBe (Economic Efficiency Assessment Framework). It provided very detailed templates for calculating costs and revenues, templates that were useful in developing the method of assessing investments, operating costs, and revenue impacts for the agency. In the same vein, The European Commission (2006) formulated eGEP framework (which focuses both on quantitative and qualitative impact.) on the basis of a review of

MAREVA, WiBe, and other frameworks developed in the UK, Holland, and Denmark; and a paper on understanding and measuring e-government (Heeks, 2006).

According to Otieno & Omwenga (2014), Liu et al., (2008), Verdegem et al., (2010) and Bhatnagar & Singh (2010) also formulated outcome based eGovernment assessment frameworks.which had been applied in developed nations with little or no application in a developing economy such as Nigeria Bhatnagar and Singh (2010) proposed a framework that identifies an e-service delivery as impacting on three groups of stakeholders: clients receiving the service; the agency that delivers the service; and the wider community in order to cover the gap of assessment framework that would be applicable in developing economy without losing the outcome -impact driven perspective supported by this research,. This framework was based on eGEP, MAREVA, WiBe and EAF and applies both quantitative and qualitative indicators for measurement.

For the purpose of understanding, EAF was a framework developed by the Department of Information Technology, Government of India, due to significant investment of resources into e-Governance projects, subjective assessments & value judgment, large National Action Plan ahead, canalizing ongoing efforts in the right direction and facilitate funding agencies to take a rational view in India with the objectives of assessing whether and to what extent a given e-Governance project has the characteristics of a good e-governance project delivering "Value" to stakeholders, having guide in funding of e-governance projects at various stages of their life-cycle (newly starting, roll-out, scaling up, replication) and providing guidelines for mid-term assessment of ongoing initiatives, so that mid-course corrections, if any, can be applied. Some of these objectives are in line with the long-term objective of conducting the current research in Nigeria context. EAF framework was based on five key attributes (service orientation, technology, sustainability, cost-effectiveness, and replicability) each with specific sub-indicators and weights, applying this in the context of PPP project and Nigeria in this study might fail to yield expected results because of its complexity.

Bhatnagar and Singh (2010) test of their framework focused on with assessment results from eight e-government projects which estimated the difference between client ratings of computerized and (earlier) manual systems. This framework is considered suitable for a case such as the one of Nigeria seaport under review in the current research work where the existing system is also manual, and an ideal ICT enabled system would be proposed and measured against the existing system in the later chapters of this study.

Bhatnagar & Singh (2010) framework provided a foundation for one of the research questions under this study (how to measure impacts of service process improvement effort). They follow the three steps highlighted below:

- Identification of stakeholders
- Definition of measurement criteria and
- Application of evaluation methodology

A) Identification of stakeholders**:** They represented the stakeholders using three groups as follows:

- the clients receiving the service,
- the agency (including implementation partners) that delivers the service;
- and the wider society consisting of citizens, businesses, government as a whole, and civil society

The above stakeholders' representation is also suitable for the current research as would be seen in later chapters.

B) Definition of measurement criteria: The criteria for measurement were categorized based on the stakeholders as follows:

1. For Client

Cost of accessing service measured directly

- Travel cost due to the number of trips made to the office for the service and distance traveled.
- Estimate of wage loss due to time spent traveling to the office for the service and waiting in each trip.
- Total time elapsed in receiving the service.
- The amount paid as bribes to functionaries or as service charges to agents to facilitate service.

■ Quality of governance.

- Extent to which functionaries can be held accountable for their actions.
- Transparency of rules and procedures.
- Availability of a mechanism to provide feedback to the agency and its effectiveness.

■ Quality of service.

- Quality of interaction with functionaries regarding their courteousness and friendliness.
- Satisfaction with the mechanism for complaint handling and problem resolution.
- Perception about the confidentiality and security of data.
- Convenience of working hours and ease of access to service.

■ Overall assessment

- Preference for the computerized system as opposed to the manual system
- Composite score measured on a 5-point scale by factoring in the attributes of a delivery system that are seen as being important by users

2. For Agency (including partners in implementation)

■ Economic impact measured directly.

- Increase in revenue through increased compliance by taxpayers, a wider base of taxpayers.
- Collection of user fees from clients, reduced leakage due to less fraud and corruption.
- Reduced cost of office space, paper, workforce, and travel.

■ Quality of governance.

- Extent of corruption among employees.
- Accountability, measured as the ability to trace decisions and actions to employees.
- Transparency of decisions, procedures, and information for internal and external clients.
- Participation, measured as the involvement of employees in internal decision processes.

■ Performance about key non-economic objectives, such as improved targeting of clients or equity in coverage.

■ Process improvements resulting in a reduction in employee workload, improved the work environment, and supervisory control.

3. Society/government as a whole

■ Long-term impact on Millennium Development Goals.

■ Image of the government.

C) Application of evaluation methodology

Bhatnagar & Singh (2010) concluded with the following impacts of their study on eight eGovernment projects in India following the approach highlighted above which also provided insights for the main question of this study of how service improvement efforts using ICT impact stakeholders.

1. For client

Client Costs

- eGovernment has reduced the number of trips users have to make to complete all transactions for a service. Greater formalization of processes after process reform, quicker retrieval of data from computerized databases, and automation of tasks, such as writing and copying of documents, as compared with manual methods, has reduced the total processing time of a service request in all applications. This has resulted in increased predictability in service delivery and reduced the number of trips.
- Reduction in waiting time has a direct impact on user costs through reduction in foregone wages
- the waiting time came down by nearly 50%

2. For Agency (including partners in implementation)

- The study revealed that staff numbers were not reduced in any project after computerization.
- workload of staff reduced.

Bhatnagar and Singh (2010) results failed to show the societal evaluation also the methodology adopted as against the action design research methodology used in this study was exploratory and data were collected using surveys and questionnaires, under this study, unstructured in-depth interview combined with personal observation were adopted. Another approach adopted by this study is the simulation techniques of comparing the existing and ideal processes instead of using five scale point of Bhatnagar and Singh (2010).

The above analysis of different frameworks in this session agrees with Polaine et al., (2013) claim that there is no single perfect method of measurement that provides robust evidence for the value of service design. However, it is important to define some measurement criteria before a new design is launched and to track these parameters to prove value and improve the service. They put it forward that service performance can be measured using either soft or hard values, these can either be assessed outwardly or inwardly. Inward how service is performing for the

user, outward, performance to the organization (service provider). In essence, service designers need to design and map design impact for Economic (Time, Cost and Revenue), Social (Security, Safety and Customer experience) and or Environmental (reduced traffic and pollution) as this study hope to achieve, but they fails to discuss the indicators that should be used or measured or simply put the procedure to follow to achieve the measurement.

This study seeks to combine suitable parts of Bhatnagar & Singh (2010) frameworks to the case study under review and planned to further explore more about the societal impact of eGovernment project that Bhatnagar & Singh (2010) played less with using environmental factors of pollution and traffic proposed by Polaine et al., (2013).

3.5 Summary

Despite the importance of seaport to national economy discussed in the previous chapter, Nigeria seaport was reported to face challenges of poor performance due to lack of adequate infrastructures and collection of illegal fees which impede business operations and adds to the cost of doing business. FMCT, (2012) statement that, "*The increasing globalization driven by ICT makes it imperative for Nigeria as an emerging market to irreversibly consider the application and promotion of ICT strategy to facilitate its rapid growth and development. This will involve the development of a vibrant ICT sector to drive and expand the national production frontiers in agriculture, manufacturing and service sectors. It would also require the application of the new knowledge to drive other soft sectors: governance, entertainments, public services, media sector, tourism, and etcetera"* FMCT (2012:11). Showed optimism and Nigeria believe that ICT is an enabler and a solution if its potential is well harnessed not only in the seaport but other sectors of the economy. But the question here is how?

Avgerou (2002) in Korpela et al., (2003) attempted to qualify how technology, especially ICT, is 'enabling' development effects. She argued that technological innovation enhances human capabilities – such as a healthy life, knowledge, creativity, and participation in the social, economic, and political life of a community – and impacts on economic growth through productivity gains but also emphasized that human capabilities are an important means of achieving technological innovation. Therefore, one could say that technology may be a reward human development and or a tool for human development. In Nigeria, a popular impact of applying ICT recorded was that of public finance electronic platforms called Treasury Single Account (TSA), Government Integrated Financial Management Information System (GIFMIS) and Integrated Payroll and Personnel Information System (IPPIS). That were reported to enable

the removal of 62,893 ghost workers, saving the federal government of Nigeria N208.7 billion (approximately 406 million Euro) after one year of implementation (NITDA, 2011 & 2015).

Scholars such as Boudreau and Robey (1996), Bergeron & Limayem (1995) in Rezgui (2000); Heek (2006) and Yildiz (2007) argued that the positive effects of ICT projects efforts are not easily achieved they affirmed that there were between 20-30% failure in project re-engineering projects in different environments. For example Cafasso (1993) in Boudreau and Robey (1996) revealed that 25% of BPR project fails while Hayley et al., (1993) in Boudreau and Robey (1996) through research of Deloitte and Touch in 1993 reported another figure of 50% failure using quality, cost reduction and competitiveness as measurement criteria. In the same vein, Heek, (2006) stated that 70-85% of e-Government projects in developing nations fail. A summary of why ICT projects fail could be given as supported by Aladwani (2013a) and Urikovi & Kovacevi (2008) to include individual, organizational structure and culture, legal, technological, social and political. Corruption was also affirmed to be an important factor influencing success and maturity of e-Government projects (Sigh, 2007 in Aladwani, 2016). This study focuses on Boudreau and Robey (1996) and Yildiz (2007) perspective that the failures of eGovernment projects were due varied conception/methods and unclear methods of an impact evaluation of such projects.

Polaine et al., (2013) argued that there is no single perfect method of measurement that provides robust evidence for the value of service design. However, it is important to define some measurement criteria before a new design is launched and to track these parameters to prove value and improve the service. They put it forward that service performance can be measured using either soft or hard values, these can either be assessed outwardly or inwardly. Inward how service is performing for the user, outward, performance to the organization (service provider). In essence, service designers need to design and map design impact for Economic(Time, Cost and Revenue), Social(Security, Safety and Customer experience) and or Environmental(reduced traffic and pollution) as this study hope to achieve, but they fails to discuss how these factors should be measured or simply put the procedure to follow to achieve the measurement. A solution to this gap was found in the Bhatnagar & Singh (2010) eGovernment assessment framework and would be used as a foundation for answering evaluation questions of this research, although with the aim of using different data collection and data analysis approach as will be seen in the next chapter of research methodology.

Chapter 4. Research Methodology.

Introduction.

This chapter explains the research methodology used to answer the research questions under this study and also discuss the stepwise collection of both primary and secondary data used in this research and their importance. It is divided into four broad sections; section one sheds light on the research questions and their relevance to the current research.
Section two discusses action design research methodology as the methodology adopted to carry out this research, its advantages over other methods previously used for this type of study and limitations about this study. This section is divided into three subsections, subsection one talks about the concept of action design research methodology (ADR), subsection two discusses the advantages of ADR over other available methodologies while the last subsection highlighted the limitations of the ADR and how they were managed in the current research.

The third section gives insights on how the data used in this study were collected with the theories that support them. This section is divided into two subsections; first is the insights on how theoretical concepts and supporting literature were gathered to help the understanding of the main concepts of this work. The second subsection deals with how the empirical data used in this research work were collected. Semi-structured in-depth interviews and personal observation used by Akesson and Edvardsson (2008); Polaine et.al, (2013); Stickdorn and Schneider (2011); Andersen (2007) and Yildiz (2007) were adopted owing to its benefit of giving opportunity to explore and query relevant issues and also verify what participants say and achieve consensus on what they mean thereby providing deeper insights into a service such as the one under this study.
The last section summarizes this chapter and its relationship to the next chapter.

4.1 Research questions

To achieve the above-stated objectives**,** the current research paper seek to answer the three main questions below:

- How to redesign service processes to meet stakeholders' needs?
- How to measure effects of process redesign efforts in a service ecosystem?
- How service process improvement affects stakeholders in the public-private organizational arrangement?

The above questions if answered is believed to proffer solutions to some of the existing challenges of the wet cargo purchasing process processes achieve some of Nigeria seaport and add to the existing body of knowledge in the field of public administration, e-government, services design and management.

The importance of the question "How to redesign services to meet stakeholders needs" is to identify the available service or process improvement methodologies that could be used to design good services in an environment that involve public-private partnership for service delivery considering the major between public and private sectors, most especially in terms of market orientation and the end users. Hence, proposing a framework to help design good service is the expected end of this question.

The question of "How to measure effects of process redesign efforts in a service ecosystem" is to know what should be measured when designing a service that involves the participation of both private and public players as seen in the case of the Nigeria Port under review. This is important because private and public sector stakeholders have varied goals, needs, and expectations and if the improvement tools are not used to design a new model that answers most if not all the stakeholders' questions, then adoption rate of the new service might be poor.

The question of "How service process improvement affects stakeholders in public-private organizational arrangement" If answered would give an insight into how process improvement efforts impact service stakeholders either economically, socially and environmentally. This if shown may encourage government and other stakeholders in service production and provision to have an either of return on investment (ROI) of adopting service design approaches**.**

4.2 Action Design Research Methodology

According to Preece and Peppard (1996), a methodology is simply theory put into practice aiming at dealing with real-world situations (Preece and Peppard, 1996 in Rezgui, 2000). There had been different methods used by scholars and practitioners to design, reorder, redesign or re-engineer product and services in the private and public domain respectively. These methods have their merits and at the same time their deficiencies. For the sake of this current research, action design research methodology (ADR) would be adopted under a case study based research to answer the research questions under this study and achieve the set research objectives.

According to Maung et al. (2011) ADR is a research methodology for generating prescriptive design knowledge through building and evaluating ensemble IT artifacts in an organizational settings. It focuses on building, intervention and evaluation of an artifact that reflects not only the theoretical precursors but also the influence of users and ongoing use in context. In another perspective, ADR as an integrated research approach that combines action research with design research. Divided the design research part into four stages, which are:

- Problems identification.
- Goals definition.
- Conceptualization of ideas and
- Design.

The action research part is divided into two stages:

- Design implementation and
- Evaluation (Cole et al., 2005; Pteffers et al., 2008 &Walls et al., 1992 in Maung et al., 2011).

4.2.1 Suitability of ADR in the study

ADR was considered suitable for this research owing to the similarity of its phases to the objectives of the adopted IDDOV method of Six Sigma earlier discussed under the theoretical concepts of this research work. For example, the following shows the IDDOV design process regarding objectives and its similarity to the design and action research parts of ADR.

- Identification phase: To define the business problem or opportunity.
- Definition phase: To understand critical needs of stakeholders.
- Design phase: To understand the elements of the process to ensure stakeholders' needs are met.

The above phases of IDDOV are similar to the design research part of ADR while the IDDOV phases of Optimization (To understand the elements of the critical satisfaction characteristics are met to pilot or prototype the new process.) and Validation (To validate the process. Access performance, failure modes, and risks and iterate until the new process is stabilized.) Share similarity with the implementation and evaluation phases of ADR methodology.

Therefore, using the ADR methodology under the current study serve the purpose of answering not only how to design research question, but also some parts of the remaining two evaluation

research questions. Also the following advantages also made ADR appropriate methodology for appropriate research.

It allows explanation toward research that generates design knowledge relevant for practitioners (Hevner et al., 2004 in Maung et al., 2011).
It recognizes IT artifacts as shaped by the interests, values, and assumptions of a wide variety of communities of developers, investors, and users. (Orlikowski and Lacono, 2001 in Maung et al., 2011).
It allows primary data gathered through qualitative interviews and personal observation (field visits) which give researchers opportunity to explore relevant issues and opportunity to query and verify what participants say and achieve consensus on what they meant thereby providing deeper insights into a service such as the one under review in this research (Polaine et al., 2013).

Although ADR as a research methodology is time-consuming, however, It enables personal involvement of researcher and service stakeholdersin the context of research as done in this study.

Focusing only on one of the methodologies (surveys, expert opinion, ethnographic studies, and internal assessments carried out by lending agencies) as mentioned by Bhatnagar and Singh (2010) or using only either action research or design research. More details of the advantages of adopting ADR methodology most especially in the area of qualitative interviews method of data collection will be discussed in the following section.

4.3 Data Collection.

The collection of data in the current research is divided into two main sections. First were the theoretical concepts and supporting literature was gathered to help identify the main concepts used in the course of this research and how previous scholars had dealt with similar topics to the current research. The data sources for the stage were secondary. Second was empirical data to support the theoretical concepts whose sources were primary in nature. Further details of the data are provided below.

4.3.1. Theoretical Concepts and other literature collection approach

The theoretical concept focuses on services, services innovation and improvements, service design, process improvement approaches and service delivery in public sector with the central

objective of answering how to redesign a service or service process. While Literatures were gathered about challenges facing Nigeria seaport and the possible solutions to the identified problems, ICT and its role in economic development, also why ICT projects fail and eGovernment evaluation frameworks. The literatures reviewed were to answer the two questions of how to evaluate service process improvement effort and the impact of service process improvement in a public-partnership organizational environment. Information about the theoretical concepts as Service concepts, Service Innovation, New public management process, service design principles and their application were compiled using books by scholars and articles both journals and periodicals. Literature reviews on the Nigeria ICT sector impact, e-Government development and implementation together with process improvement methodologies were discussed more specifically about Nigeria context to have a better understanding of the case under review. Relevant data on the theoretical concepts and supporting literature were gathered from secondary sources such as Journal articles, newspaper articles, textbooks, public agencies publications and periodicals and web portals.

4.3.2 Empirical Data collection approach

Unstructured in-depth interview and participant observation approaches of qualitative research method as used and proposed by Stickdorn & Schneider (2011);Welman et al., (2003); Polaine et al. (2013) and Stickdorn & Schneider (2011) with the objectives of gaining insights into service stakeholders (roles, goals, tasks), problems (with possible solutions)associated with refined petroleum ordering and delivering in Lagos, Nigeria. Also, other citizens in the service environment were interviewed as depth insights require more stakeholders apart from the service provider as supported by Polaine et al., (2013). The choice of unstructured in-depth interview and participant observations to gather data were due to the following reasons:

- Unstructured in-depth interview allows open structure questions; this gives room for opportunity to explore relevant issues and opportunity to query and verify what they say and achieve consensus on what they mean.
- Unstructured in-depth interview is less expensive to undertake compared to focus groups that are structurally problematic, also, each participant gets only a few minutes to speak, and also these short interactions might be influenced by social pressures.
- Unstructured in-depth interviews offer deeper insights and proof to be efficient way to engage with people in their context and allow them to explain how they see things.
- Unstructured in-depth interview allows the time to uncover some levels of details.

- For validation and additional understanding of the existing processes in Lagos Port of Nigeria under this research, participant observation methods was added as this also provide rich, in-depth and accurate insights most especially the context, behaviour, motivation, interactions and the reality of what stakeholders do rather than what they say in in-depth interview, it helped further know stakeholder's latent need, although this method could be time consuming, time-consuming. However, it is a good method to explore unfamiliar field as in the case under review Polaine et al., (2013).

The interviews used for this study was conducted using the interview guide as shown in Appendix 1 for six weeks between 23rd March 2016 and 22nd April 2016 in Lagos Nigeria. Interviewees were chosen using snowball technique proposed by Andersen (2007) with the following steps: a participation program was drawn containing list of identified stakeholders, one of them was contacted for interview and was asked for referral to other stakeholders that are involved in the processes of the seaport under this research to participate in the interview. The snowballing continued until more necessary stakeholders involved in the process under review in this paper were interviewed. A total 20 participants were interviewed with the interview time ranges from 10 to 60 minutes according to the availability of the interviewee giving the average time of the interview with each interviewee of 30mins. Questions asked from the participants based on their relationships and roles in the case study under review. All interviewee agreed to the publishing of their names in the current paper. The table below shows the details of the interviewees.

Table 5. Overview of Interviews and participants.

Names	Position/Organization	Stakeholders type	Interview duration (mins)
Akinbode Moses	Sales Manager, Ascon Oil Company Ltd.	Service provider (oil marketer).	46
Agbaje A.O.	Territorial Operation Manager, Total Nigeria Plc.	Service provider (oil marketer).	48
Adebayo Gbadamosi	Logistics Officer, Ibufon Oil Ltd.	Service provider (oil marketer).	34
Babatunde Badejo	CEO, Tamio Global.	Service User (Oil buyer).	60
Eric Chinedu	Freight Forwarder.	Service provider.	23
Charles Okonkwo	MD, Andoch Global Serv. Ltd.	Service provider	45
Benedict Nwagboso	Operation Manager, Andoch Global Serv. Ltd.	Service provider	45
Jaji Abiodun	Car dealer	Service user	26

Fatima Kazeem	Profit center manager, United Bank for Africa PLC.	Service provider	15
Oyewale Samuel	Company Representative	Service user	41
Muhammed Ali	Company Representative	Service user	16
Olaniyan Babatunde	Officer, Nigerian Port Authority	Service provider (government agency)	38
Sunday Opalanimu	Officer, Nigerian Custom Service.	Service provider (government agency).	39
Sunday	Transport agent.	Service user.	11
Samuel	Driver.	Service user.	25
Micheal	Operation Manager.	Service user.	28
Bello Ibrahim	Driver.	Service user.	6
Ejiro	Driver.	Service user.	7
Sunday Olagbaju	Account Officer, United Bank for Africa Plc.	Service provider.	10

Bolaji Akanni	Account Officer, United Bank for Africa Plc.	Service provider.	17

In addition to interviews, participant observation and secondary sources of data such as historical documents, industry and stakeholders publications and newspaper articles related to Lagos port operation were used to validate the responses gotten from the interview.

4.3.3. Characteristics of data collected during interviews.

Each interview was held in English and recorded on a digital voice recorder. All interviews were safely stored and the relevant outcomes of the interviews to this research were transferred into a research report that will be presented later in the current paper. The interview follows different structures but all the main aim of getting to understand the following about the distribution of processes of refined petroleum products. Details of the interview guide are as shown in Appendix 1.

All Participants were asked questions relevant to their participation in the process with main concentration on the following questions:

- The service/process stakeholders and their roles?.
- Their needs, goals and expectations from the process?.
- Bottlenecks in the process?
- Causes of bottlenecks?
- The impact of the bottlenecks on stakeholders?
- Possible solutions to identified bottlenecks in the process?

The responses were analyzed about each topic above to bring out the critical answers as following the critical incident tool proposed by Andersen (2007).

The above question were concentrated on because of their relevance to the current study because it helps to identify the stakeholders involved in the service, their roles and their relationships with the one another (process flow), where improvements are needed in the process based on participants goals, the possible improvement tools , and strategies that can be used . In

summary, the outcome of the data collection in this exercise helps to gather insights on answers to the research questions and objectives of this study as used in Chapter 5.

4.3.4. Reliability of the data

The data from the interviewees are reliable as the interviewees were comprised of experienced professionals and other stakeholders in maritime industry of Nigeria. All the interviewee are actively involved in the distribution processes of refined petroleum products and other goods at Lagos seaports of Nigeria either as individuals, businesses, union representatives, government representatives, citizens and residents of Nigeria. Also, the events and circumstances discussed in the interviews are current. Hence, this reduces the bias that might be due to imperfect memory.

However, the data cannot be totally free from bias as the interviewees have the tendency to portray self and or other stakeholders in a positive light. The effect of this bias will be minimal on the outcome of this research as independent participants, and process observation was carried out to validate or correct information.

4.4. Limitations of research methodology

Using a case study method as done in this paper e.g. Nigeria port had been criticized by scholars e.g. Runeson et al. (2013) for having less value as it is difficult to generalize from and also of the outcome possibility of being subject to bias by researchers among others. These limitations can be reduced if more public services are subjected to the action design research methodology in Nigeria in the light of process re-engineering and also in other countries to enable a certain degree of generalization of these research findings. However, adoption of face to face in-depth interviews the experts and stakeholders in the process under review and participant observation to generate data so that the high level of insights required for a detailed understanding of the process can be acquired helps reduce the possible bias of researcher.

Also, ADR methodology is time-consuming and expensive. Hence, researcher's and stakeholders' commitment is required, this method might be difficult to use when time and financial resources are scarce.

Chapter 5 Empirical data and analysis

This chapter will present the outcome of the interviews conducted. These are used as the source data required to analyze the existing purchasing process of wet cargo at the port and subsequently answer the current paper research questions and thereby form the foundation for the next two chapters of this study. The relevant interview outcomes will be presented using combination of various service design methodologies and tools such as Cudney & Furterer, (2012) IDDOV six sigma design process as design phases and Muang et al. (2011) action design research methodology objectives as design objectives, Andersen (2007) business process improvement framework as design activities together with Stickdorn & Schneider (2011), Andersen (2007) and Polaine et al., (2013) design methods as design tools ranging from in-depth interviews, brainstorming, process modelling, critical incident analysis to simulation as required by each phase of design.. Thus, this chapter will be divided into four sessions as summarized using the table below:

Table 6: Refined petroleum products purchasing process of Nigeria seaport improvement plan.

S/N	Design Process	Design Objectives	Design Activities	Design Tools
1	Identification phase.	To identify service problems.	Identify stakeholders. Identify stakeholders' roles and concerns. Understand existing process. Collect performance shortcoming existing process.	Interview, brainstorming and process modeling.
2	Definition phase.	To define service process goals.	Analyse data about shortcoming. Develop performance priorities for the process. Generate improvement ideas.	Critical incident, Eliminate, Integrate, Simplify and Automate (EISA) tool. Interviews, Brainstorming.
3	Design phase.	To conceptualize ideas.	Create improvement.	Process modelling
4	Validation Phase.	To measure if process	Compare process Economic performance	Simulation techniques.

		performance achievement.	using time, ICT and human capital usage as parameters	

5.1. Identification phase

This phase was to identify the stakeholders, their roles, and expectations from the service process under review. Stakeholders' relationships were also mapped, described and modeled.

5.1.1 Activity 1: Identification of process stakeholders, their roles, and concerns:

All participants participate in this activity by sharing their experience through the process. The outcome of their responses are as shown in the table below:

Table 7: Primary stakeholders' analysis of the existing purchase process

Stakeholders	Stakeholders type	Roles	Expectation(s)
Government Agency (PPPRA).	Service provider.	Price regulator.	Pricing rules compliant.
Government Agency (PEFMB).	Service provider.	Logistic costs regulator and equalizer.	Logistic rules and fees payment are compliant.
Oil marketers.	Service provider.	Sales of oil products to buyers.	Efficiency and Cost effectiveness
Transporters.	Service provider and user.	Provision of logistics.	Efficiency and Cost-effectiveness.
Buyers.	Service user.	Oil product retailers.	Efficiency and Cost effectiveness

The above table shows primary Stakeholders analysis of the ordering and delivery processes of refined petroleum product, their roles, and expectation from the process.
The result above shows that the government agencies involved in the process are keen at rules compliant and fee payment, while the oil marketers, transporters and buyers focus on service efficiency and cost effectiveness.

5.1.2. Activity 2: The stakeholders' relationship (existing process-AS IS)

This was a continuation of activity 1; all the identified stakeholders provided insight into how their tasks, their relationships with other stakeholders while accessing the service. The stages below show the stepwise procedures from the buyers' perspective.

1. Process start when buyer calls oil marketer to confirm product availability (START)

2. If available negotiates price and volume, if an agreement is reached, payment is made by the buyer to the oil marketer's bank account.

3. Oil marketer confirms payment, process the order and advise the buyer of pick up schedule. The schedule is published manually in front of the oil marketer's depots.

4. Buyer confirms name availability on the published schedule by visiting the depot for confirmation, if confirmed; loading permit in the form of tag is raised by the oil marketers for the buyer.

5. The buyer gives the transporter tag (loading permit) to pick the product at designated depot.

6. Transporter joins the queue of the designated depot to pick up the product.

7. At the entrance of the depot, loading permit is confirmed and security checks are done on the truck by the depot operator.

8. If the above confirmation and checks are good, the transporter proceeds to designated loading compartment.

9. The tanker is loaded by the oil marketer.

10. Waybill showing the details of the product and the offloading point is issued to the transporter by the depot operator post loading.

11. PPRA official checks the product pricing if in line with prevailing rules and regulation

12. And if offloading point is more than 300km from the depot, the Petroleum Equalization Fund (PEF) official conducts bridging process for the buyer to get a refund on transportation cost. If the destination is less than 300km, no bridging is required.

13. If the above processes are completed, then the loaded truck exits and return to the buyer (END).

The above process was represented "AS IS" model using Bizagi Modeling software as shown in Appendix 3.

5.1.3. Activity 3: Collection of performance shortcomings existing process

All the interviewees that are involved in petroleum products purchasing process reported **long waiting time on physical queue** as the major bottleneck of the process.

5.2 Definition phase

Under this phase, the bottlenecks of the existing process were defined, with their causative factors. Also all stakeholders proposed possible solutions through brainstorming as shown in the subsection below.

5.2.1 Activity 1: Identification process bottlenecks, causative factors, and proposed solutions

All participants attributed the bottleneck in the section above to many factors that are grouped by the causative agent, responsible stakeholder and proposed solutions as shown in Table 8 using Andersen (2007) critical incident analysis tool:

Table 8. Identified process bottlenecks, causative stakeholder and proposed solutions.

	Causes of process bottlenecks	Responsible stakeholder	Proposed solutions
1.	Bureaucracy in the processes.	Government agencies and oil marketers.	Process redesign & Automation of processes.
2.	Lack of transparency and Insincerity.	Oil marketers.	Process redesign & Automation of processes.
3.	Inconsistent operational standards of depots.	Oil marketers.	Enforcement of uniform standard adoption by depot operators.
4.	Batching process delay	Oil marketers.	Process redesign & Automation of processes.
5.	Indiscriminate truck packing.	Transporters.	Provision of waiting areas for trucks.
6.	Poor vehicle maintenance.	Transporters.	Government and Union enforcement of vehicle inspection

			law.
7.	Corrupt practices.	Government agencies and oil marketers.	Process redesign & Automation of processes.
8.	Poor road infrastructures.	Government agencies.	Road reconstruction and maintenance.
9.	Lack of holding bays at depots.	Oil marketers.	Each depot should be mandated to have a waiting depot to capacity.
10.	Lack of public parking areas for tankers.	Government.	Bann of indiscriminate parking of trucks and trailers.
11.	Service time	Government agencies and oil marketers.	Reschedule the working model to include night and also off-peak periods.
12.	Inadequate workforce.	Government agencies and oil marketers, Transporters.	Recruiting of more human capital.

13	Sharing of entrance and exit by more than one oil depots.	Oil marketers.	Create separate entry and exit points for each oil depots.

The table above showed various problems associated with existing purchasing process of wet cargo; it also showed the cause of the problem. Typical of the outcome was the fact that all stakeholders are in one way or the other responsible for the problems and the proposed solutions cut across the use of ICT to infrastructural development.

5.2.2. The impact of existing process bottleneck based on shareholders responses

Listed below are the responses from the participants on category of impact; economic, social and environmental in relation to various stakeholders in the purchasing process.

Table 9. Impact of existing process bottlenecks on stakeholders

Group of shareholder/impacts category	Economic impact	Social	Environmental
Government agency (ies).	Loss of fees.	Image challenge, Loss of life due to accidents.	Diseases due indiscriminate defecation and Pollution.
Oil marketers.	Demurrages.	Insecurity, Loss of life due to accidents.	Diseases due indiscriminate defecation and Pollution.

Transporters	Time wastage, Loss of belongings to robbery.	Insecurity, Loss of life due to accidents, Sleep loss.	Diseases due indiscriminate defecation and Pollution.
Buyers	Time wastage, Loss of belongings to robbery.	Insecurity, Loss of life due to accidents.	Diseases due indiscriminate defecation and Pollution.

The outcome of the existing process above showed that all stakeholders are negatively influenced economically, socially or environmentally.

5.3 Design Phase.

This is stage to create the ideal (TO BE) that would reflect the suggested solutions from all stakeholders and GoSwift as queue management software provider.

5.3.1. Stakeholders' relationship (Ideal process- TO BE)

1. Buyer check GS platform, search and choose buyer and order product electronically.
2. Oil marketer process the order and advise buyer.
3. Buyer receives advice, if positive, make payment electronically to oil marketer, if not, and search again for another oil marketer.
4. Oil marketer receives and confirms payment to the buyer.
5. Buyer choose and upload transporter details to oil marketer

6. Oil marketer acknowledges the transporter detail, batch buyer, and upload to GS

7. GS process and advise buyer loading permit.

8. Buyer receives permit and advice transporter of loading.

9. Transporter proceeds to gate on time for checks.

10. Checks done by PTD and other agencies, if good, proceed to depot, if not return to waiting area.

11. Depot oil marketer receives transporter, confirm appointment, load and issue waybill.

12. Agency (PPPRA or PEF) approve and advise exit.

13. Transporter exit.

14. Buyer receives product (END).

The above process is represented as TO BE model using Bizagi Modelling software as shown in

Appendix 4.

5.4. Validation Phase

Simulation analysis of AS IS and TO BE process models are conducted during this phase**.** The essence of this stage is to enable measurement of the impact of the creation outcome by introducing resource parameters of human capital, time and IT solutions to the AS IS and TO BE models and compare the benefits of TO BE over AS IS. The tool used was Bizagi software. This shows the possible impact of the new model of the refined petroleum purchasing process in the real word. Appendixes five and six show the result of the analysis.

5.4.1. Summary of simulation analysis result.

This section shows the outcome of the simulation analysis of the existing (AS IS) and the ideal (TO BE) models based stakeholders' workload in the processes.

Table 10 below shows the simulation result of existing process subjected to different conditions of human capital resources, ICT in the space of time required to complete a process and stakeholders workload in percentage.

- For the buyer, 100% buyer involvement is required to carry out enjoy the service, and approximately 62days is required to complete a process or service cycle.
- For a transporter, approximately 71% for 2days.
- For Depot, approximately 14.84% for one-quarter of a day while 0.66% and 3.62% of government agencies and ICT are required respectively.

Table 10. AS IS model simulation result

Stakeholders/Parameter	Utilization (%) per process.	Time(days) per process
Buyer	100.00	62.0
Transporter	71.13	1.7
Depot	14.84	0.3
Government	0.66	0.003
ICT	3.62	

Table 11 below showed the simulation result of ideal process subjected to different conditions of human capital resources, ICT in the space of time taken to complete a process and stakeholders workload in percentage.

- For the buyer, 81% buyer level of interaction or workload is required to carry out enjoy the service, and approximately 11days is required to complete a process or service cycle.
- For a transporter, approximately 12% for about 3days.
- For oil marketer, approximately 19.5% for one-quarter of a day while 2.62% and 8.78% of government agencies and ICT are required respectively.

Table 11. TO BE model simulation result

Stakeholders/Parameter	Utilization (%) per process.	Time(days) per process
Buyer	81.37	11.3
Transporter	11.95	2.9
Depot	19.48	1.2
Government	2.62	0.2
ICT	8.78	

5.4.2. Performance comparison of "AS IS" and "TO BE" models.

A). Stakeholders level of interaction or workload**:** This means stakeholders workload or level of interaction with the system. Despite keeping other resources in the "AS IS" and "TO BE" model constant, the introduction of variables such as waiting areas for trucks, rearrangement of stakeholder relationships in the TO BE model and introduction of more ICT including GS software shows a considerable reduction in the interaction of stakeholders. Most especially buyer and transporter AS IS showed 100% and 71% level of interaction as compared TO BE of 81% and 12% respectively but increase in interaction" level with the system were seen for depot operators and government agencies with "AS IS" being 14.84% and 0.66% respectively while TO BE were 19.5% and 2.62% respectively as shown in Table 12 below.

Table 12: Comparison of AS IS and TO BE process regarding interaction level.

Stakeholders/Parameter	Utilization (%) per process(AS IS)	Utilization (%) per process(TO BE)	Time(days) per process(AS IS)	Time(days) per process(TO BE)
Buyer	100.00	81.37	62.0	11.3
Transporter	71.13	11.95	1.7	2.9
Oil marketer (Depot operator)	14.84	19.48	0.3	1.2
Government	0.66	2.62	0.003	0.2
TOTAL	186.63	115.42	64	15
ICT	3.62	8.78		

B) Process completion time: As shown in the AS IS simulation results in Appendix five and six it took buyer an average of 62 days to complete a process cycle as compared to the TO BE model which took an average of 11 days. Given a variance of 51days. The TO BE variant is faster for the buyer. However, for other stakeholders under the same condition, the process redesign and utilization of ICT require more time from them to complete a process cycle.

In essence, the results showed that introduction of ICT and other process redesign or arrangement do not guarantee a reduction in time taken to complete a process or of stakeholder interaction required to complete a service cycle in all circumstance.

One could summarize that they are not only positive impact of process improvement but also some negative impact. Also, there are some impacts that are more difficult to quantify, such as social and environmental impacts. Responses from the interviewee on the impact of the "AS IS" process in the seaport showed social and environmental impacts which could not be measured directly pre- implementation of "TO BE" process design. Further explanation of the results would be provided in the next chapter.

Chapter 6: Discussion.

This section discusses the findings of the research in line with the study objective and research questions. This section is relevant as it shows the result of this research and compares it with what has been done by other researchers. This chapter is made up of four sections: section one will summarize the result of the findings in line with literature reviewed. Section two will discuss the results with the research questions; section three will discuss the implications of findings while the last section will talk about the limitations and how to overcome them.

6.1. Summary of findings.

Findings were in support of the problems long waiting and processing time experienced by the mostly the buyers during the purchase of refined petroleum products at the oil depots of the Nigeria seaport.

For instance in the current process and ideal process respectively, the results in the table showed that stakeholders workload and time to complete a purchase process was reduced from 186% and 64 days to 115% and 15 days respectively with the increment of ICT usage in the by about 6%. In essence, this is drastic impact in terms of overall time-saving and reduced workload of stakeholders such as buyer and the transporter as support by scholars such as Heeks (2006); Yiltz (2007) and Bhatnagar & Singh (2010) on proponents of eGovernments to save time and cost of service delivery and consumption in the relationship between stakeholders of governments and businesses and or citizens. This study result is also in support of similar evaluation research of Bhatnagar & Singh (2010) in India where eight different eGovernment projects were reported to be improved in terms of time and cost. Also, the reduced level of interaction for the service users could reduce the level of corruption in the service process.

Overall, the result of this research supports the view of Maung & Harindranath (2004) and Heeks (2005).Avgerou (2003) in Korpela et al., (2003) and drawing from statement of Polaine (2013) that ICT is a tool for human development or driver of the economy due to its application for improved process or service as seen in the case of this study rather than only seeing ICT as-as commodity or components such as hardware and software or a product of human development. However one might be misled to think that only introduction of ICT (GoSwift online queue management solution instead of traditional physical queue) to the ideal (TO BE) process helped to achieved the improvement of purchasing process under this study, the improvement could be attributed to other factors such as introducing waiting areas for trucks to

wait for their turns before proceeding to the oil depot to load instead constituting nuisance on the road or society at large. In essence, improvement as also backed by Hartley (2005) might require a combination of more than one type of innovation for example service, process and governance innovation were combined to bring about the improvement as used in the case under review.

Also, the proponents of eGovernment to help reduce corruption played out in the result of the improvement project in this study.

6.2 Research findings and how it answers the research questions

This study was set to investigate the effects of service process improvement in a public-private partnership environment. From the result discussed above, showed that that impact of service process improvements could be direct(economic- Time, Cost and Revenue) or indirect(social security, environmental, level of corruption, transparency, safety and customer experience among others). For instance in the current process and ideal process respectively, the results in the table showed that stakeholders workload and time to complete a purchase process was reduced from 186% and 64 days to 115% and 15 days respectively with the increment of ICT usage in the by about 6%. In essence, this is drastic impact in terms of overall time-saving and reduced workload of stakeholders such as buyer and the transporter, here, the reduction in stakeholder's workload or level of interaction in the purchasing process under this study could mean the indirect impact of reduced bribery or corruption in the system if the new process is implemented.

The above finding was supported by Bhatnagar & Singh (2010) and Polaine et al., (2013) conclusion of economic and social impact of eGovernment or process improvement projects, for the current study, process completion time and level of interaction with stakeholders(workload) for buyers and transporters were reduced. In essence, this study agrees that impact of service process improvements could be direct(economic- time, cost and revenue) or indirect(social security, environmental, level of corruption, transparency, safety and customer experience among others).

However**,** it was also seen from the result of this study that not all service improvement efforts could yield direct positive benefits to stakeholders. This was reflected by increased workloads of oil marketers and government agencies as seen in the result of newly designed process(AS IS)

simulation result in Table 12 under this study. This type could be a case explained by Hartley (2005) that "not all innovation guarantees positive benefit". In essence, this could indicate service improvement effort proposed by this study might not have direct positive impact on oil marketers or government agencies but the indirect benefits of the process improvement such as improved transparency and reduced corruption is worth considering as it promises to give reputation to the government and the oil marketers.

The question of impact of service process improvement in a public-private partnership environment were supported with the following two supporting questions:

- How to redesign service processes to meet stakeholders needs?
- How to measure effects of process redesign efforts in a service ecosystem?

Different approaches had been adopted by different authors and scholars to design a new service and or redesign an existing, ranging from process reengineering methodology of Boudreau & Robey., (1996) to service design approach of Polaine et al (2013) but this research opines that there is no single approach to designing service or service process, this opinion is supported b scholars such as Edvardsson & Olsson(1996) in Goldstein et al., (2002), Andersen(2007); Polaine et al., (2013) and Stickdorn & Schneider (2011) conclusions in different working environment. However, designing or redesigning a service or service process required detailed understanding of the existing service process,

that it is important to understand the service concept (the needs of the service stakeholders and how they can be satisfied) as this help in predetermining the how to design and measure the effects of service improvement efforts as pointed out by Lovelock(2010). The following steps which agree with the opinion of this reseaach could be the used in irrespective of context:

- Scoping problems by insight research and workshops or other tools.
- Analysing design parameters by service blueprinting.
- Generation of feasible solutions by service proposition development
- Implementation of the selected option by combining experience prototyping, testing, and delivery as proposed by Katzan (2010) and Polaine et al. (2013).

Each step above requires interdisciplinary approach and or tools to make them functional as used in the current study as one might find it difficult to know the suitable approach for different service context, especially for services in public-partnership organizational environment peculiar to this research as the needs of all the stakeholders involved would to be required to be taken into account when designing, hence, this study combined various service design methodologies and tools such as Cudney & Furterer, (2012)IDDOV six sigma design

process as design phases and Muang et al., (2011) action design research methodology objectives as design objectives, Andersen (2007) business process improvement framework as design activities together with Stickdorn & Schneider (2011), Andersen (2007) and Polaine et al., (2013) design methods as design tools ranging from in-depth interviews, brainstorming, process modelling, critical incident analysis to simulation as required by each phase of design as shown in Table 6. This combination was used a framework to redesign the existing service under this study to bring about the new design (TO BE model) under Appendix 4 of this research work. The framework used here could be used if properly modified to redesign other services in similar or different service environment.

In essence, this work opines that there is no straightforward approach to redesign or improve a service, service redesign might require that one consider following steps such as understanding of service context, analysing performance shortcoming and setting a new design goals based on the stakeholders involved, generating improvement ideas, creation of new service, implement the new service and implement. This study supports the iterative nature of service design and further opines that ex-ante evaluation is necessary before implementation to avert stakeholders investing in projects that fail to meet expectation.

The above discussion opens the up the how to evaluate impact of a redesign effort, this current research agrees with combination of approaches used by Bhatnagar & Singh (2010) and Polaine et al., (2013) to measure impact of service process improvement effort these follows three stages of identification of stakeholders, definition of measurement criteria and application of evaluation methodology. Identification of stakeholders helps to group the stakeholders according to their roles the service as earlier shown in Table 7. The measurement criteria as it relates to the current research work and case study is revealed in Appendix 8. This determines what to measure. From these criteria, one could say that there are direct and indirect ways of measuring the impact of improvement efforts, which could be grouped into economic and social measurement criteria and invariably two impacts of service process improvement efforts to be considered when the question of impacts of service process improvement surfaced. An indirect way of measuring impact of service process improvement as in this research could be to convert the time saved by the new process to social value while the direct ways of impact assessment deals with deals with economic values such as time saved and cost of accessing services.

A related study to the current research was conducted by Bhatnagar & Singh (2010) to evaluate impacts of eight eGovernment projects in India revealed that service improvement effort helped

reduce the number of trips users have to make to complete all transactions for a service, greater standardization of processes after process reform, quicker retrieval of data from computerized databases, and automation of tasks, such as writing and copying of documents, as compared with manual methods, thereby reducing the total processing time of a service request in all applications, resulting in increased predictability in service delivery and reduced the number of trips.

Reduction in service procee time could have a direct impact on user costs through a reduction in foregone wages and as shown under this study by the simulation analysis of the new process for buyer and transporter in the purchasing process.

An unexpected result was seen in the case of oil marketers and government agencies stakeholder in the case under this research where workload and time to complete a process cycle increases in the ideal process simulation analysis. This could connote an increase in workload for government agencies workers and oil marketers in the real world post new service implementation. Hartley (2005) explained this phenomenon by saying that not all innovation brings about a positive effect. In another perspective, more automation of the internal processes of the government agencies and oil marketers might help reduce the workload.

The above phenomenon might require further research, for example, using the same ADR methodology for post-implementation evaluation of the case under the current research and compare the results with both this ex-ante evaluation currently covered by this research and that of post implementation evaluation result. Another research possibility is to use the exploratory research methodology with quantitative data collection method as used by Bhatnagar & Singh (2010) in ex-ante evaluation of the new purchasing process and compare the results with that found in the current research.

In all, one could opine that process improvement of the refined petroleum purchasing process in Nigeria seaport projects looks promising as it discussed above, also it might bring innovative ways of providing information and delivering services to the stakeholders and also providing governments agencies and oil marketers with new opportunities of bringing services closer to the buyers and transporters in efficient and transparent ways, but some factors need might be required for its successful implementation one of these factors could be governance innovations that required new organizational arrangement at Nigeria seaport, the present conflicting and interwoven roles determined by politicians, prevalence of uncompleted contracts and subsidies from government that aid internal inefficiencies, issues of excessive bureaucratic controls, to government interference and intervention, and other public service culture of undermining and compromising efficiency and optimum productivity as reported by

Heeks (2006); Kumar & Best(2006) Ogunsiji & Ogunsiji (2010); Jerome (2008) in Oghojafor (2012) and Aladwani (2016) need to be looked into. Also, technological changes and digital divide, for example a developing nation like Nigeria where majority have little or no access to IT infrastructures like data and internet mentioned by Yildz (2007) and Urikovi & Kovacevi (2008) to be challenges of successful implementation of eGovernment mostly in developing nations like Nigeria need to be considered and provided for before implementation, otherwise the improvement project might exclude some stakeholders from participating actively in the new service or her processes. In essence, If not managed properly, the inability to provide online services to all citizens can stop eGovernment projects.

Also, heterogeneous nature of service supported by Sabine (2010) would require investment in stakeholders' capacity development to be able to use new solutions otherwise change impact becomes minimal as a result of standardization of service because different stakeholders tend to have different perspective of the quality of service they get most especially when ICT such as GoSwift queue management solution is introduced in an environment such as Nigeria where there is digital divide on the part of some of the stakeholders involved in the purchasing process under this study.

Chapter 7. Conclusion

This study supported both Bhatnagar & Singh (2010) and Polaine et al., (2013) conclusion of economic and social impact of eGovernment or process improvement projects as seen in the result of this study where process completion time and level of interaction with stakeholders(workload) such as the buyers and transporters were reduced.

In another**,** it also agreed that not all service improvement efforts could yield direct positive benefits to stakeholders based on the proposed increased workloads of oil marketers and government agencies as seen after the service process improvement in this study as backed by Hartley (2005). Meaning that impact assessment of eGovernment projects should not only focus on the economic impacts but also the social impacts. Otherwise, perceived failure of eGovernment projects might increase despite its proponents. For example, the stakeholder's workload or level of interaction in the purchasing process under this study could mean the indirect impact of reduced bribery or corruption in the system if the new process is implemented

In essence, this study agrees that impact of service process improvements could be direct(economic- Time, Cost and Revenue) or indirect(social security, environmental, level of corruption, transparency, safety and customer experience among others).

This study also showed that understanding of the service concept is a prerequisite to successful service redesigning efforts as concluded by Edvardsson & Olsson (1996) in Goldstein et al., (2002); Andersen (2007); Stickdorn & Schneider (2011) and Polaine et al., (2013) claims. It is therefore important to understand service stakeholders, their relationships, and needs of the service stakeholders and how they can be satisfied as this help in predetermining the how to redesign a service that meets the needs of not only the stakeholders but to the society at large.

In essence, this study supports the conclusion of Polaine et al., (2013) that that there is no straightforward approach to redesign or improve a service, hence, service redesign would require designers following iterative steps of steps of understanding of service concept , analysing performance shortcoming and setting a new design goals based on the stakeholders involved, generating improvement ideas, creation of new service, perform ex-ante evaluation, if promising, then implement the new service and perform post ante evaluation as shown in the service improvement plan of Table six of this study. Meaning that each service or service process and all stakeholders goals should determine the suitable approach or tools to carry out the improvement efforts. Although with the iterative steps aforementioned. A suitable guide to follow in

redesigning a service would be the redesigning service plan used in this study as shown in Table 6 of the current research.

Also, from literature reviewed under this study, one could submit that there are no single perfect method process or how to measure the impacts of an improvement effort, however, it is important to define some measurement criteria pre-design phase in order to use them as the basis of impact assessment either pre or post implementation of the new service. Bhatnagar & Singh (2010) eGovernment framework shown in Appendix 7 under this study would be recommended as a guide; this might require modification based on the type of service, type of stakeholders involved in the service and their service and strategic goals.

This study proposed that ex-ante evaluation is necessary before implementation to avert stakeholder's disappointment of an eGovernment projects, it might also help decision makers to make informed decisions on which projects to invest in, and this if carefully done might could help define the parameters that the implemented projects performance assessment would be based upon for future projects.

In summary, using GoSwift queue management software as one of the improvement tools of the current purchasing process of petroleum products in Lagos seaport Nigeria would achieve the expected impact of reducing the long waiting time on physical queue which is the major problem or process bottleneck. However, as supported by Polaine, (2013) ICT should be handled as a supporting tool and not an end itself. Hence, the there is need for other forms of innovations such as organizational and social and also reorientation of the stakeholders for the full impact of the improvement effort to be maximized example of these innovations include construction of good road infrastructures in Lagos, most especially at the seaport and its environment, provision of well-managed waiting areas for trucks among others as reflected in the ideal purchasing process designed. Also, all the stakeholders should be properly trained and managed at the early stage of implementation of the new service for better adoption and usage.

7.1 Relevance of research.

This research helps to find possible solutions and reduce the negative impact of unstructured seaport services in the Nigeria earlier explained under this research by proposing a better

purchasing system for all stakeholders to maximize the positive benefits of the seaport service under review.

It would also serve as a guide for GoSwift as an eGovernment solution provider to develop and implement their prospective solutions to meet the Nigeria seaport need and also justify the importance of their solution as a suitable component to consider in reducing the traffic congestion of Lagos seaport environment and the entire community.

The service improvement plan formulated and used in this study could be adopted to redesign an existing processes or services both in private and public sector because it emanated from different service improvement methodologies already used and proposed by researchers and authors respectively and applied the ones suitable for redesigning services most especially in a complex public -private partnership environment.

The results of the impact assessment of the ICT application in process improvement effort provided a way to evaluate the potential of public-private partnerships in e-government in developing economies such as Nigeria.

Also, this work proposed how hard and soft metrics of impact assessment can be included from the scratch when planning or redesigning a service by introducing GoSwift IT solution in the context of Nigeria. This might aid decision making by the affected stakeholders if a project is worth investment or not.

Bhatnagar and Singh (2010) Evaluation framework built upon by this research if modified is expected to useful for evaluation individual or group of projects, either ex-ante or ex-post to determine whether the projects need implemented or not.

This paper would assist policy-makers, state and government agencies (for example, the National Information Technology Development Agency (NITDA) Nigeria; authority responsible for coordinating ICT strategies and implementation) in developing countries to evaluate impact of their e-government initiatives and justify funding for ongoing and future projects. The academia, civil society, donors and sponsors of e-government projects will also benefit from the new knowledge generated and giving justification for current or future funding of e-government services. It would also encourage the understanding and participation of private players like businesses and citizens.

Finally, this research added to the existing body of knowledge in e-governance and its implementation most especially in developing nations such as Nigeria by providing frameworks or building on existing frameworks on how service process improvement influence stakeholders in the public-private organizational arrangement . Therefore, encouraging further studies that would look at e-Government in developing countries differently while focusing on how e-government projects efforts can be evaluated

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7.2 Recommendation for further studies

This study calls for further research for example, using the same ADR methodology for post-implementation evaluation of the case under the current research and compare the results with both this ex-ante evaluation currently covered by this research and that of Bhatnagar and Singh (2010) post implementation evaluation.

Another research possibility is to use the exploratory research methodology with quantitative data collection method in ex-ante evaluation of the ideal purchasing process instead of interview and personal observation as data collection for methodology.

Formulated frameworks in this research also should be tested on more service especially that of public services instead of public-private environment with more concentration on social impact evaluation of service improvement projects.

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Appendixes

1. Interview questions

1. What are your business goals?
2. What are your expectations from a business cycle?
3. How do you measure the effectiveness of your work?
4. At what point do you say your needs and expectations are met?
5. What is your typical business day like in terms of roles and responsibilities?
6. Who are the stakeholders you deal with in the course of business?
7. What are the roles of each stakeholder?
8. How do each contribute to successes and or failures of your business?
9. What are the processes you go through in a business cycle?
10. What are your tasks in the processes
11. What is the average time to complete a business cycle?
12. What are the documents you follow? Are there other requirements?
13. Which of the business processes or services saves your time, human capital and money you most and how?
14. Which of them is mostly consuming in terms of time, human capital and why?
15. Which are the other difficult parts of your service experience?
16. What effect does each have on your business?
17. In what order would you prefer these difficult parts simplified?
18. What are the major complaints you get about your service or process from users/customers?
19. How do you manage these complaints?
20. What are the major complaints you receive from the service providers
21. How do you manage these complaints?
22. Do you belong to any union and how do you think this influence your business
23. What would you say are the cause of the problems in this industry?
24. How would you advise these problems are solved?
25. Do you consider government a threat or solution in this case, how

2. Consent Letter

Dear Participant,

I am Thomas Olusola Ajayi, an international Master's programme student of e-Governance Technologies and Services from the Tallinn University of Technology in Estonia.

I am soliciting your participation which requires answer to oral interview questions on Port activities to enable get data for my research. The research is aimed at improving the service experience at the Nigeria Port. This interview is recorded for validation of responses post interview.

Kindly note that your participation is voluntary and the results of the research study might be published which may require your names, position and organization to be included.
Please indicate below whether data about you can be published or should you prefer to be anonymous.

If you have any question about the research study, please contact me via email at thomas.ajayi@ttu.ee or solaomoajayi@gmail.com

Signing of this note will be considered as your consent to participate.

Thank you.

Participant Names: ……..

Position:

Organization…….

Level of data usage: Published ( ), Anonymous ( )

Email and Phone no……..

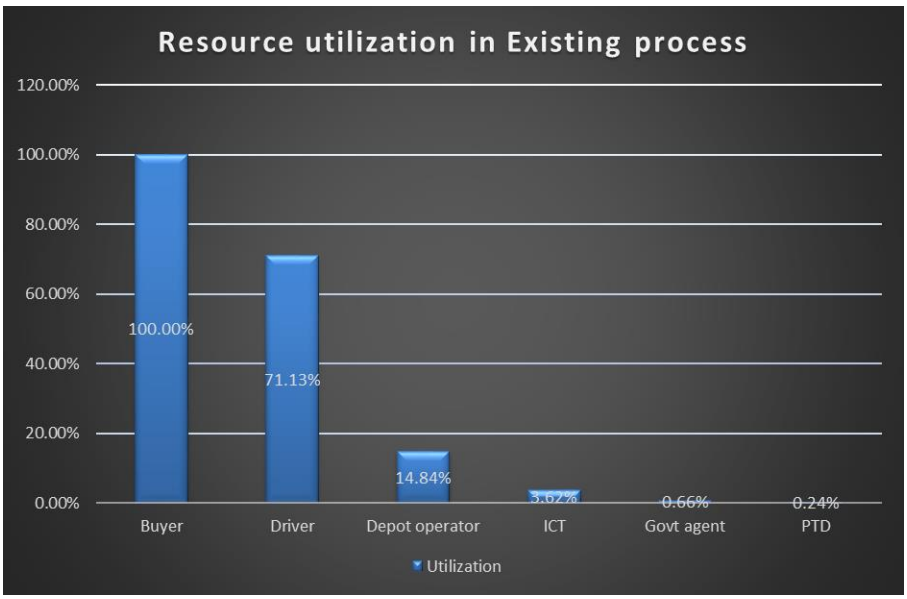
Participant signature and Date:.....

3. Existing (AS IS) Service process model. (Hard copy attached)

4. Ideal (TO BE) Service process model. (Hard copy attached)

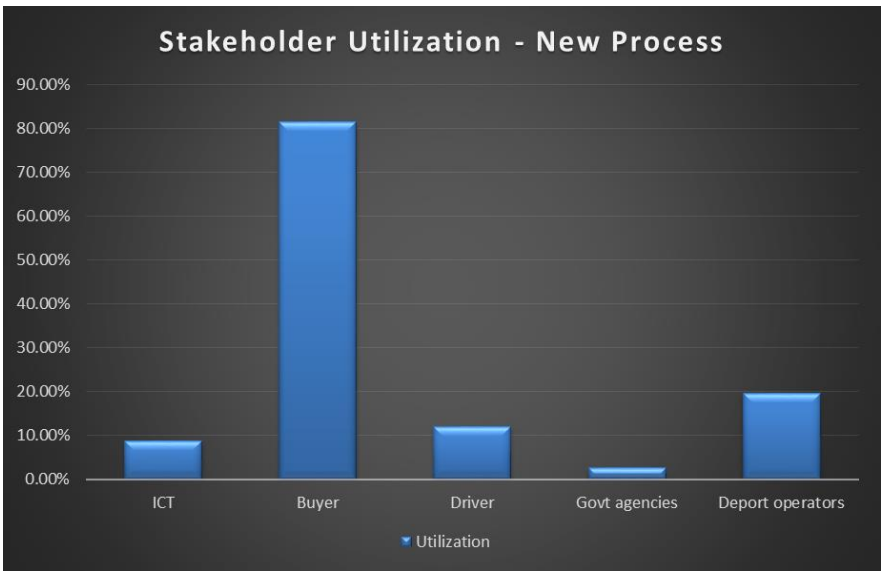
5. Simulation analysis of AS IS model

Name	Type	Instances completed	Instances started	Min. time (m)	Max. time (m)	Avg. time (m)	Total time (m)
Process 1	Process	0	100	-1	-1	0	9275155.12
Available?	Gateway	644	644				
ok?	Gateway	253	253				
join the loading queue	Task	15	16	1074.21	18870.47	7210.52	108157.82
Good	Gateway	15	15				
proceed to load	Task	6	6	4.07	982.8	361.08	2166.48
issue waybill	Task	6	6	5.82	13.85	9.47	56.81
If product is PMS with distance >300km	Gateway	6	6				
Approve truck exit	Task	6	6	17.77	158.22	74.88	449.27
exit depot	Task	6	6	17.63	3205.03	1891.81	11350.84
receive products	Task	6	6	0	0	0	0
NoneEnd	End event	6					
evaluate request	Task	322	322	31.25	88.25	59.1	19031.29
look for another seller	Task	239	240	431.07	11717.01	7875.61	1882270.99
confirm correctness	Task	253	253	5.57	14.31	10.06	2544.03
make changes	Task	27	27	5670.02	11437.69	9561.49	258160.13
conduct security checks	Task	15	15	5.79	16.97	13.26	198.87
Reject truck	Task	2	2	4.7	5.73	5.22	10.44
advice rejection	Task	2	2	7.69	7.7	7.7	15.39
receive rejection	Task	2	2	0	0	0	0
change truck	Task	1	1	11132.19	11132.19	11132.19	11132.19
NoneStart	Start event	100					
Request for product	Task	322	322	35.67	11671.81	7012.35	2257976.36
Receive feedback	Task	644	644	0	0	0	0
receive request	Task	322	322	0	0	0	0
Send feedback	Task	322	322	5.52	14.83	10.18	3277.66
receive payment	Task	226	226	0	0	0	0
Require changes	Task	31	31	5.53	13.82	9.22	285.89
Paste schedule	Task	222	222	10.94	29.54	18.56	4120.13
Raise loading ticket	Task	222	222	15.75	44.4	29.91	6640.57
give loading ticket	Task	222	222	5.6	14.75	10.05	2230.59
Pay for product	Task	226	226	459.76	11609.45	7884.44	1781882.5
receive advice	Task	31	31	0	0	0	0
collect loading permit	Task	183	183	3610.48	11795.36	9506.88	1739758.64
handed over to transporter	Task	109	110	8142.77	11687.28	9778.02	1065804.09
collect loading permit	Task	37	37	37.95	18918.79	3176.73	117539.13
Load truck	Task	6	6	9.11	12.8	10.44	62.62
Bridging done	Task	5	5	3.85	9.41	6.48	32.39



6. Simulation analysis of TO BE model.

Name	Scenario	Type	Instances completed	Instances started	Min. time (m)	Max. time (m)	Avg. time (m)	Total time (m)
Logistic process variant 2	Scenario 1	Process	99	100	9045.26	39397.85	22538.27	2274121.11
positive	Scenario 1	Gateway	202	202				
good	Scenario 1	Gateway	110	110				
NoneEnd	Scenario 1	End event	100					
NoneEnd	Scenario 1	End event	99					
NoneEnd	Scenario 1	End event	100					
Check GS platform	Scenario 1	Task	100	100	7.19	709.38	336.7	33670.32
Choose seller and make request	Scenario 1	Task	202	202	32.45	1260.52	834.39	168546.77
process request	Scenario 1	Task	202	202	16.33	1323.98	135.82	27435.51
advise buyer	Scenario 1	Task	202	202	5.58	373.46	26.47	5346.98
receive advise	Scenario 1	Task	202	202	10.29	1249.73	775.61	156673.71
make payment	Scenario 1	Task	100	100	34.4	1266.19	844.5	84449.79
receive payment	Scenario 1	Task	100	100	0	0	0	0
advise confirmation	Scenario 1	Task	100	100	11.75	1277.46	266.04	26603.96
receive confirmation	Scenario 1	Task	100	100	4.81	4270.38	802.19	80219.07
receive transporter details	Scenario 1	Task	100	100	0	0	0	0
choose & upload transporter details	Scenario 1	Task	100	100	27.66	5626.65	787.62	78762.25
generate and advice code	Scenario 1	Task	100	100	2.07	4.72	3.32	331.73
receive loading permit	Scenario 1	Task	100	100	2.27	9717.41	871.91	87191.34
advise transporter	Scenario 1	Task	110	110	5.6	8989.29	707.37	77811.1
recieve permit	Scenario 1	Task	110	110	686.66	9054.57	3780.79	415887.03
proceed to gate	Scenario 1	Task	110	110	6.16	403.77	34.57	3803.08
reject and notify buyer	Scenario 1	Task	10	10	8.96	71.3	22.69	226.9
proceed to depot	Scenario 1	Task	100	100	20.51	426.8	98.07	9806.95
checks done by PTD & others	Scenario 1	Task	110	110	5.52	1574.53	240.33	26436.01
confirm appointment	Scenario 1	Task	100	100	6	1128.19	25.54	2553.83
load and issue waybill	Scenario 1	Task	100	100	15.65	53.63	22.16	2216.18
Agencies approve	Scenario 1	Task	100	100	11.02	61.53	18.4	1839.51
advise exit	Scenario 1	Task	100	100	3.43	1112.82	17.27	1727.07
recieve exit notification	Scenario 1	Task	100	100	0	0	0	0
receive exit notification	Scenario 1	Task	100	100	0	0	0	0
receive exit notification	Scenario 1	Task	100	100	3.3	8977.06	3415.14	341514.16
receive product	Scenario 1	Task	99	100	172.46	9957.15	5328.84	527555.17
batch buyer	Scenario 1	Task	100	100	68.78	2409.13	1135.13	113512.69
NoneStart	Scenario 1	Start event	100					



7. Measurement criteria for impact evaluation.

A) Identification of stakeholders: They represented the stakeholders using three groups as follows:

- the clients receiving the service,
- the agency (including implementation partners) that delivers the service;
- and the wider society consisting of citizens, businesses, government as a whole, and civil society

B) Definition of measurement criteria: The criteria for measurement were categorized based on the stakeholders needs as follows:

1. for Client

Cost of accessing service measured directly

- Travel cost due to the number of trips made to the office for the service and distance travelled.
- Estimate of wage loss due to time spent traveling to the office for the service and waiting in each trip.
- Total time elapsed in receiving the service.
- Amount paid as bribes to functionaries or as service charges to agents to facilitate service.

■ Quality of governance.

- Extent to which functionaries can be held accountable for their actions.
- Transparency of rules and procedures.
- Availability of a mechanism to provide feedback to the agency and its effectiveness.

■ Quality of service.

- Quality of interaction with functionaries in terms of their courteousness and friendliness.
- Satisfaction with the mechanism for complaint handling and problem resolution.
- Perception about the confidentiality and security of data.
- Convenience of working hours and ease of access to service.

■ Overall assessment

- Preference for the computerized system as opposed to the manual system
- Composite score measured on a 5-point scale by factoring in the attributes of a delivery system that are seen as being important by users

2. For Agency (including partners in implementation)

■ Economic impact measured directly.

- Increase in revenue through increased compliance by taxpayers, wider base of taxpayers.
- Collection of user fees from clients, reduced leakage due to less fraud and corruption.
- Reduced cost of office space, paper, manpower, and travel.

■ Quality of governance.

- Extent of corruption among employees.
- Accountability, measured as the ability to trace decisions and actions to employees.
- Transparency of decisions, procedures, and information for internal and external clients.
- Participation, measured as the involvement of employees in internal decision processes.

■ Performance with regard to key non-economic objectives, such as improved targeting of clients or equity in coverage.

■ Process improvements resulting in reduction in employee workload, improved work. Environment, and supervisory control.

3. Society/government as a whole

■ Image of the government.
■ People's way of life.

- Their health and wellbeing.
- State of complete physical and mental wellbeing.

C) Application of evaluation methodology