DETERMINANTS OF SERVICE DELIVERY AT THE PORT OF MOMBASA, KENYA

BY

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A THESIS SUBMITTED TO THE SCHOOL OF BUSINESS AND ECONOMICS, IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF LOGISTICS AND PROCUREMENT

MOI UNIVERSITY

2021

DECLARATION

Declaration by Candidate

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DEDICATION

To my lovely wife, Edina Talam and my children Cynthia and Gladwel, Felix and Kibet ,uncle Teacher whyclif and my parents Mr &Mrs kiptalam ole Sopia.

ACKNOWLEDGEMENT

I wish to acknowledge my supervisors; Dr Yusuf Kibet and Dr Emily Chemjor for their dedicated professional guidance they have offered me during the writing of this thesis. I also acknowledge my family and friends and in particular my class mates for the team spirit and encouragement.

I wish to thank all staff of the school of Business and economics for their support. In a special way, I also acknowledge the Kenya School of Revenue Administrtion Mombasa fraternity for facilities and resources.

ABSTRACT

Kenya Port Authority is still facing myriad challenges such as infrastructural development, high logistical costs and unskilled workforce affecting its service delivery. It was in this regard that the researcher sought to establish determinants of service delivery at the Port of Mombasa. This study was guided by the following specific objectives; to examine the effect of information, determine the effect of infrastructure, and to assess the influence of custom clearance process on service delivery at the Port of Mombasa. The study was built on human capital theory, Servqual model and queuing theory as pillars of this study. The research study adopted a explanatory research design. Target population was 1200 consisting of clearing and forwarding agents, shipping agents, transporters and warehousing firms. A closed ended structured questionnaire was used to collect primary data from 137 sampled respondents. A pilot study was conducted to ascertain the reliability and validity of the instruments. The quality and consistency of the study was further assessed using Cronbach's alpha. Data presentation in form frequency counts, percentages, means, standard deviations, regression and correlation was presented in form of tables. It was detetermined that r^2 =0.625 which implied that infrastructure development, customs service clearance, information systemms and staff competency can explained 62.5% of service delivery at KPA. The P- value of 0.000 (Less than 0.05) implies that the model of was significant at the 95% confidence level. The study found out that information system significantly contributes to the improvement of service delivery (β_1=0.259; P=0.000). It was also determined that improvement in infrastructure development would lead to an improvement in service delivery ((β_2=0.400; P=0.003). Further the study determined that an improvement in custom clearance process would lead to an improvement of service delivery ((β_3=0.361; P.=0.000). Finally the study found out that an improvement of staff competence would significantly lead to an improvement of service delivery at the port of Mombasa (β_4=**0**.372; P=0.027). The researcher concluded that there is need to evaluate other determinants which contribute to successful service delivery at Kenya Ports Authority. The study also concluded that infrastructure development plays a significant role and was the most important factor that ought to be considered by organization at Mombasa port in order to enhance service delivery. This was followed by staff competency then information system while customs clearance was the least. The study recommends that organization should continue investing more in infrastructure development to enhance efficiency, through automation to minimize human conduct so as to avoid bureaucratic procedures that hampers and slows down clearance processes. The study further recommends training of personnel to improve on efficiency in service delivery at the port.

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ABBREVIATION & ACRONYMS

CFS	Container Freight Solution
CTS	Cargo Tracking System
DGPS	Differential Global Positioning System
DOT	Department Of Transport
EAC	East African Community
ECTS	Electronic Cargo Tracking System
GPS	Global Positioning System
ICC	International Chamber of Commerce
ISO	International Organization for Standardization
KPI	Key Performance Indicators
KRA	Kenya Revenue Authority
MSP	Maritime Security Program
OECD	Organization of Economic Co-operation and Development
PWC	Price Waterhouse Coopers
RFID	Radio Frequency Identification
TEU	Twenty-Foot Equivalent Unit
UNCTAD	United Nations Conference on Trade and Development
USAID	United States Aid
USITC	US International Trade Commission
WTO	World Trade Organization

OPERATIONAL DEFINITION OF TERMS

For the purpose of this research project,the following meanings will be attached for the following terms;

Customs Clearance Service: This dimension describes leaders' behavior as drawing in followers through emotions and admiration and engendering trust and confidence from team members (McCleskey 2014).

Information System: Transformational leaders demonstrate concern for individuals, get to know them, listen to employee concerns and ideas, determine assignments based on individual strengths and desires, and promote individual success and achievement (Harter L. 2014).

Infrastructure Development: It is a systematic approach to dealing with the transition or transformation of an organization's goals, processes or technologies (Rouse, 2018).

Service Delivery: Leaders who motivate team members to excellence through optimism, creating an attainable view of the future and goal achievement (Northouse, 2013).

CHAPTER ONE

INTRODUCTION

1.0 Overview

The overview of the chapter covers the background of the study, statement of the problem, research objectives, research hypothesis, justification and significant of the study and finally the scope of the study.

1.1 Background of Study

Service quality can be seen as the gap as the between the expected service and the actual perceived service (Al-Ababneh, 2017). Basically, the purpose of port of Mombasa is to create a satisfied customer. The creation of customer satisfaction can provide several benefits, such as the relationship between the organisation and the customer becoming more harmonious, providing a good foundation for repeat purchases and the creation of customer loyalty, and generating word-of-mouth recommendations that are profitable for the organization (Nuridin, 2018).

The vast majority of research into port service delivery has focused on efficiency, or ‘doing things right’. While some research has looked at port service delivery in terms of effectiveness, in almost every case it is concerned with effectiveness in economic terms, such as the rate of profitability, the studies consider measures such as rate of port throughput, terminal performance, port congestion, availability of stevedore services, and so on that are deemed to influence effectiveness and logistics service delivery, (GS1, 2014).

The trade in the global scene has been carried out for many centuries. The major instruments of accessing the trade routes and market has been pegged on the maritime transport. It is estimated that maritime transportation accounts up to 80% of the world’s voluminous trade (UNCTAD, 2014). The rest of the transport takes place in rail, road

and air transport. The linkage of the various continents has been through the sea transport due to its strategic points. The aspect of competition and need to being abreast in maritime transport has coerced various ports to have restructuring so as to meet the ISO qualification standards. Due to this rapid development, the ports in various countries are being transformed to have modern and specialized equipment to handle huge volume of cargo (Zhao & Godchild, 2010).

The history of ports dates back in 480 BCE in Athens, Greece at the port of Piraeus. This port was used to facilitate war between the Athens and the Persians. It has over the time been seen as a great town due to trade at the ports (Barletta & Bichou, 2007). Alexandria in Maghreb of Africa was well known as point of exchange between North Africa and the Europe region especially the Greece. Osaka, Japan emerged as a great town in south East Asia due to its trading in rice as a major commodity at the sea port, the Dutch traders were the most frequent traders since time immemorial. It is worth noting that some ports have ceased to exist or became dysfunctional due to coastal erosion. Some notable ports are like Ravenspurn in the United Kingdom, Antica in Italy and Lothal in India.

India as a member of OECD, has in the last two decades revamped its trade dimensions. The maritime transport constituted up to 90% of trade and in the voluminous trade and 77% is constituted of the value in trade. India is well covered with a vast coastline of about 7571 KM. this has made India to have 12 major ports spread across its coastline and another additional 174 minor ports. There exists a great difference in way of operation of the ports. It is estimated that the 12 major ports in India actually account for up to 76% of the container traffic (Mukherjee, 2007). With an enormous population, the presence of major ports has seen India grow in the container traffic of up to 20% in the last decade. Despite the presence of numerous ports, only one port in India has been

named and rated for good operational excellence, the port of Jawaharlal Nehru. In the year 2017, it was ranked 33 out of the best 40 ports according to world Maritime Report (UNCTAD, 2017). Despite Asia accounting for up to a third of the container traffic globally, there has been increase in freight cost from a paltry 15% to over 115% in the last one decade. This is due to insufficient structural development in India as compared to their counter parts like China which has the Leading port in Singapore. There has been great laxity in the ports of India to upgrade to newer standards so as to meet market changes and demand (UN, 2003).

The United States of America as an economic power house in North America got its independence in 1789. In effort to encourage trade and vessel use, various legislations has been made and enacted over time. The well renowned legislations are: The Jones Act, Maritime Security Program (MSP), Cargo Preference Laws and the Tonnage Tax. The Maritime in The USA has pegged on technology which has led up to 60% of cargo handling being carried out by the maritime transport (DOT, 2008). The maritime sector in USA highly depends on the wellbeing of international trade (Hummels & Schaur, 2013). It is estimated that up to 28% of the economy depends on the maritime industry. There has been great need for the USA policy makers to revamp its maritime industry since by the year 2020, 35% of the GDP will depend on the Import-Export trade. In the year 2038, 55% of the GDP of the USA economy will be done through the import and export business (PWC, 2008). In order to streamline the port logistical issues, various measures have been undertaken by policy makers. The policy makers have examined inefficacies' like inadequate land area for expansion, insufficient gantry cranes, insufficiency of other handling equipment and lack of adequate berth age (USITC,2008).

Australia, as a bulwark economy in Oceania, is well known for its contribution to the basket of the world in agricultural exports (Rolfe & Gregor, 2003). The proportion of contribution in world's agriculture stands at 2.93% and projected to increase in the near future. In as much as future of the export market looks bright, the aspect of logistical costs has had a negative externality ion the performance (AIG, 2007). Some of the obstacles faced by the logistical sector are: high volume nature of goods, long distance involved from the farm to port and the low value of the agricultural exports. Borrowing a leaf from the Neo classical theory, the policy makers in Australia, in order to be competitive and relevant in the market scene there has been call for revamping the technological innovation (Calderon and Chong, 2004). Some of the areas of the logistical chain system identified by policy makers. In Australia which have probable greater room for expansion are the: cold storage chain system, the booking and compliance system, the cargo tracking system (CTS) and the order-Payment system. A revamp and better application of technology in the above notable areas has the ability to reduce the logistical issues at the port and also to improve performance of the logistical firms in Australia (Trace, 2008).

In East Asia, The Port of Singapore Authority runs one of the most technologically advanced ports and information technology is the tool behind making it the most efficient port in the World (lee et al, 2003).The Country is in severe lack of land hence, the efficient utilization of existing land is crucial for the port and this was achieved by the sophisticated technology used in the port. This is a good example of overcoming physical limitations by the proper utilization of information technologies. The information system in port of Singapore is separated into three levels (Applagate *et al*, 2003). The Singapore experience shows how IT can reduce the consequences of disadvantages; Singapore cannot dramatically increase its land area, but it has used

information technology to improve the capacity of its limited physical resources to run a large Port.

Singapore's strategy of supplementing its location and harbor with manmade resources has overcome the limitations of the natural resources to create a Port whose location, harbor, infrastructure, and operations and information technology combined are rare. While Operations and Information Technology has helped cut on cost by reducing man power in some instances, reduce time and increase quality, its major contribution has been to create flexibility. This flexibility allows Port of Singapore Authority to enlarge the capacity of the Port to handle more ships and cargo. In this way, operations and information technology take on a role comparable to physical infrastructure; in this move one can expand a Port physically to provide more capacity, or one can employ technology to increase the volume of cargo handled by an existing physical infrastructure.

In Europe, the European Union as a trading bloc faces two major challenges in its port logistics and subsequent port performance (DOT, 2011). The first issue is the refugee crisis that has been eminent since 2015 and the Brexit deal. The refugee crisis has put a lot of pressure on the port performance of most of the EU members for they have notably been the entry points of refugees from the Middle East and the Maghreb regions of Africa. Refugee menace is already adding crisis to the already existing dynamics affecting port performance in Europe (Richard, 2017). The other noticeable issues have been increased fuel prices, civil and political unrest in the Middle East, The Maghreb, Some EU member countries debt crisis and stiff competition from Asia and Middle East ports. In regards to the Brexit issue, some members' countries have been adversely affected (Gordon, 2017). First the UK logistical players have been affected since there

is no clear plan for them in regards to the Brexit plan. Despite the logistical challenges in sea ports, Europe still has an upper hand in stake of port logistics with port like Hamburg, Rotterdam and Antwerp being recognized in the world map for their excellent performance in cargo handling ad clearance (WTO, 2017).

In the Sub-Saharan Africa, South Africa is revered to as the best performing economy in Africa continent. South Africa has a vast coastline bordering the Indian and Atlantic Ocean. According to the last logistical performance index of 2012, South Africa was rated to have 3.67 out of the 1-5 scale and also ranked 23 out of the 155 countries ranked. The fair rating of the logistical performance lies to the fact it has the major ports connected to the global maritime routes. In fact it connects the five major continents: South America, North America, Oceania, Middle East, South East Asia and Europe. The port of Durban in Durban City is the largest and busiest not only in South Africa but also in Africa. The Durban Sea port for the last five years on average boosted handling 34.1 million tonnes of cargo and revered as the fourth largest holder of containers in the Southern Hemisphere with an average of 2,568,124 TEU on average since 2012 to 2016. Despite the bright gleam of the sea port in South Africa, it is faced with myriad challenges affecting its service delivery: infrastructural development, high logistical costs and unskilled workforce (World Bank, 2017).

Nigeria is a West African country well known for being the most populous boosting to a figure above 190 million people. The adjacency of the Atlantic Ocean makes Nigeria reliable on the maritime transport. On the other hand, the inland water transport have had myriad of challenges in course of navigating upstream. The challenges have been: presence of creeks, cataracts and seasonal rivers. According to the last logistical performance index of 2012, Nigeria was given a score of 2.45 out of the scale of 1-5

scale and ranked 121 out of 155 countries selected for the ranking. This poor rating as compared to the South Africa depicts the Myriad challenges Nigeria faces in course of its logistical performance at the ports. From the year 2000, Nigeria undertook some measures to beef up the port performance. There was partial privatization to help eliminate bottlenecks like cargo theft, overstaffing and pilferage at the port (PWC, 2014).

Ports have traditionally evaluated their performance by comparing their actual and optimum throughputs (measured in tonnage or number of containers handled). If a port's actual throughput approaches its optimum throughput over time, the conclusion is that its performance has improved over time. On the other hand when the port registers poor performance such as high container dwell time, threat of Vessel delay surcharge and worst still is the big ships avoiding the port. In the long run this renders transport from the port un-competitive by factual analysis. Crane productivity which is calculated per crane and can be expressed in gross and net values; Port Productivity, there are seven different productivity measures which terminal operators need to compute, al-though they may wish to include others for monitoring their productivity. These core productivity measures are: Ship productivity which is the broadest measures are: Ship productivity which is the broadest measures of ship by poor gate operations has resulted in an increase in truck turnaround within the port area. Entry and exit is now taking as much as 6 hours. (Kenya Transport Association, 2008) Loading Point in efficiencies; when it comes to loading within the port, trucks are spending up to 6 hours to load for containerized cargo and 2 days for bulk and conventional cargo. For instance, most of the loading at the grain bulk handling facility happens at night when the customs department is closed and transporters have to wait until the following day to load. Traffic Congestion within Port Cities and Cities along the Transport Corridor;

both the cities of Dares salaam and Mombasa are heavily congested with huge volumes of truck traffic entering and leaving the ports.

In Mombasa, the heavy traffic between the port exit gates and Mariakani means that trucks are spending as much as 6 hours to navigate through a 30KMs stretch, which ordinarily would take 30 minutes. The situation is compounded by narrow roads and single lane roads between Changamwe and Miritini. As for cities along the corridor, Nairobi and Eldoret and Kampala are the most notorious in terms of traffics congestion. Lack of bypass roads in these cities, coupled with single lane roads passing through Eldoret town mean that trucks are spending an average 5 hours to transit through these cities at peak hours. Such infrastructure constraints within the port area and major cities along the transport corridor are responsible for the long truck turnaround times recorded in this survey Delays related to delivery at destination points; it is taking up to two days for trucks to off load cargo at destination points. This is common for local and other tran-sit cargo that is destined for bonded warehouses where importers have failed to fulfill their tax and regulatory obligations when cargo crosses borders and thus trucks experience unnecessary delays as they await customs clearance. (East Africa Logistics Performance Survey 2012)

Port activity is no longer limited to just cargo handling; logistics service provision in an international context has become a core part of the business (Wang and Cullinane, 2006). In this situation, the most imperative aspects of logistics performance are logistics costs and reliability of supply chains. Poor logistics facilitation takes a large toll on a country's competitive advantage, and insights in this respect were conferred by Arvis *et al.* (2007). In a world of just-in-time production processes, it is not only the time and cost of delivery of shipments that matters, but also its reliability and

predictability. A firm's hedging costs due to poor reliability and predictability of logistics services can be significantly high in terms of higher inventory maintenance requirements (Arvis *et al*., 2010). Despite such significance, the impacts of port infrastructure quality and logistics performance on a country's trade and economy have been largely overlook Meanwhile, many countries are planning to build up regional hub ports, following successful cases such as Singapore, Shenzhen, Hong Kong, Dubai, to name a few and expecting additional growth of their economies in forms of new service markets. This could be aided by developing transshipment facility and efficient transport network. However, the port–city relationship has changed and the urban structure of cities is no longer important for explaining the intensity and spatial distribution of maritime transport networks (Ducruet *et a*l., 2016). Slack & Gouvernal (2015) argued that the potential for economic development through hub port development is more limited than suggested in most maritime literature.

Due to structural changes in the global shipping industry, neither a port's throughput projection nor its economic contribution performs with the degree of certainty expected by the planners (Hesse, 2006). Also, the demolition of the shipping conference system in 2008 and the global financial crisis in 2009 hit the shipping industry adversely (Munim & Schramm, 2017). According to Grossmann (2008), "economic growth has shifted to newer economic sectors which require investments into different locational factors, a high quality of life and an attractive, well-function city-core". Hence, before investing millions of dollars in building up or expanding port infrastructure, it is important to understand the extent to which ports impact national or regional economy.in the existing port economics literature.

The Port of Mombasa is the largest in East Africa and a vital gateway for imports to Kenya and its neighboring countries. It is strategically located on the East African Ocean coastline between Durban and major ports in the Red Sea and Middle East (KPA; 2008). The Port of Mombasa serves the Kenyan national economy and also facilitates maritime trade for landlocked countries neighboring Kenya. The port's hinterland includes Kenya, Uganda, Northern Tanzania, Rwanda, Burundi, D.R. Congo, Southern Sudan and Ethiopia. Kenya Ports Authority (KPA) manages the port's operations (KPA, 2019). During the defunct East African Community (EAC) Kenya, Uganda and Tanzania used to collectively manage their national resources. However, after the collapse of the community in 1978. Each country had to take full ownership of their respective national resources and manage them profitably. It is during this time that Kenya through her parliament formed numerous parastatals to manage the diverse resources within its borders. Kenya Ports Authority-KPA was one of these parastatals (Port Gazette, 2015).

The Port of Mombasa has exceeded its design capacity throughput of 250.000. 20-foot equivalent container units (TEU) which has put pressure on the existing custom bonded warehouses, yet it is expected to handle growing imports and exports. It is already operating at maximum capacity for both general and containerized cargo, and will suffer progressive declines in operational effectiveness unless both capacity utilization and efficiency issues are urgently addressed (Barnett. 2009). The situation of poor capacity utilization on the custom bonded warehouses and high demand has inevitably resulted in port congestion. This has resulted on the delays for not only the shipping companies but also the logistics firms locally.

1.2 Statement of Problem

The port of Mombasa is striving to connect to major ports on global maritime routes to improve on its logistical performance. Despite this bright gleam of Mombasa sea port, the port is still facing myriad challenges such as infrastructural development, high logistical costs and unskilled workforce affecting its service delivery (World Bank, 2017). The port has also continued to register poor performance such as high container dwell time, threat of vessel delay surcharge and worst still is the big ships avoiding the port. Poor crane and ship productivity has resulted in an increase in truck turnaround within the port area. Entry and exit is now taking as much as 6 hours (Kenya Transport Association, 2008). Loading point in-efficiencies; when it comes to loading within the port, trucks are spending up to 6 hours to load for containerized cargo and 2 days for bulk and conventional cargo. For instance, most of the loading at the grain bulk handling facility happens at night when the customs department is closed and transporters have to wait until the following day to load.

Traffic Congestion within port city and cities along the Northern Transport Corridor from Mombasa are heavily congested with huge volumes of truck traffic entering and leaving the ports. As for cities along the corridor, Nairobi and Eldoret and Kampala are the most notorious in terms of traffics causing trucks to spend an average of 5 hours to transit through these cities at peak hours. Such infrastructure constraints within the port area and major cities along the transport corridor are responsible for the long truck turnaround times. Delays related to delivery at destination points is now taking up to two days for trucks to off load cargo at destination points. This is now common for local and other transit cargo destined for bonded warehouses where importers have failed to fulfill their tax and regulatory obligations when cargo crosses borders. This

causes trucks to experience unnecessary delays as they await customs clearance. (East Africa Logistics Performance Survey, 2012).

In as much as future of the export market looks bright, the aspect of logistical costs has had a negative impact on the performance (AIG, 2007). Some of the logistical obstacles the port are high volume of goods, long distance from the farm to port and the low value of the agricultural exports. Additionally, the port of Mombasa has exceeded its design capacity throughput of 250.000. 20-foot equivalent container units (TEU) has put pressure on the existing custom bonded warehouses that is expected to handle growing imports and exports and operate at a maximum capacity for both general and containerized cargo. At this rate the port is likely going to suffer progressive declines in operational effectiveness unless both capacity utilization and efficiency issues are urgently addressed (Barnett. 2009). The situation of poor capacity utilization on the custom bonded warehouses and high demand has inevitably resulted in port congestion. This has resulted in delays not only for the shipping companies but also the logistics firms locally. With the growth in international trade, international ports are under pressure to upgrade and provide modern technology. They are also being forced to improve terminals efficiency to provide competitive advantages that will lure more ships (Daniel & Harback 2016).

Despite the importance of KPA and the problems facing the port, limited study have been directed on the topic. For instance, Datche and Kisingu (2017), examined the factors influencing logistics service delivery at the port of Mombasa. Adieri (2012), studied the factors affecting efficiency of container freight stations at the port of Mombasa. Nyema (2014), examined the factors influencing container terminals efficiency. Based on the study review it was evident that conceptual and methodological

research gap exists on the determinants of service delivery at the Port of Mombasa. It was in the regard of the existing problem and the existing problem that formed the basis of this study.

1.3 Objectives of the Study

1.3.1 General Objective

The main purpose and objective of this study was to establish the determinants of service delivery at the Port of Mombasa.

1.3.2 Specific Objectives

i. To examine the effect of information system on service delivery at the Port of Mombasa.

ii. To determine the effect of infrastructure on service delivery at the Port of Mombasa.

iii. To assess the influence of custom clearance process on service delivery at the Port of Mombasa.

iv. To determine the influence of staff competence level on service delivery at the Port of Mombasa.

1.4 Hypothesis Statements

The study will have the following null research hypotheses:

H_{01}: There is no significant effect between information system and service delivery at the Port of Mombasa

H_{02}: There is no significant effect between port infrastructure development and service delivery at the Port of Mombasa.

H_{03}: There is significant effect between custom clearance process and service delivery at the Port of Mombasa

H_{04}: There is no significant effect between staff competence level and service delivery at the Port of Mombasa.

1.5 Significance of the Study

The main purpose of this research is to determine the logistical issues influencing performance of logistical firms at the port of Mombasa Kenya. This study will be important to various stakeholders; the Kenyan Government, the study will be of great importance to its agencies like the KRA and KPA. Currently the Kenya Ports Authority is implementing the performance of marine operations at the port of Mombasa. This is a strategy to ensure the institution is right on track concerning marine operations. The recommendations from the study can be used in making guidelines and policies that are of great importance to all government lead programs in regards to port performance.

To the private sector players, the study will inform its key partners and policy makers on the current status pertaining issues in the logistical performance at the various ports in the country and also in the peer ports in the East African Region like Tanzania. The study results shall guide the policy options, interventions and support to be instituted for improving the logistical performance at the various ports in the country of Kenya and the neighboring peer ports. The instituted policies have the indirect impact of improving the other vital sectors that are indirectly or directly affected by the port performance. To the future researchers, the study will form a resource material for aspects related to logistical operations at the various ports of the country. The concerns raised in the study are also expected to act as a reference point to various studies that could be used to strengthen diversity related to logistical operations and its principles in logistical processes.

1.6 Scope of the Study

The research was carried out in Mombasa port of Kenya and in logistical firms that carry out business at the port. The logistical firms involved included clearing and forwarding firms, transport companies, shipping agencies and freight forwarders. The respondents were senior level employees working in logistical firms. The study focused on the determinants service delivery logistical operations at the port of Mombasa. This is due to the vibrant logistical firms within the town as well as easy accessibility to the researcher thus lowering the cost of undertaking the research.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

In this chapter looked at literature review related to and consistent with the objectives of the study. Important theoretical and practical problems are brought out; relevant literature on the aspects pertaining to determinats of service delivery in Mombasa port was addressed in this chapter. The study concluded by discussing the research gaps, conceptual framework and operationalization of the study variables.

2.1 Overview of Concept of Service Delivery.

2.1.1 Concept of Service Delivery

The concept and notion of service delivery is the practice of providing customers with a positive helpful experience when they enter a business, throughout the time they stay at the business, and even after the customer leaves, should they have additional questions or products to return (Thompson & Kolsky, 2014). According to Parasuraman, Valarie, Zeithaml & Berry (2015), service delivery is objective when it is related to external tangible features which can be measured factually (Brown, *et al.*, 2016). Subjective service delivery is rated when a customer's imagination, personal experiences, emotions, expectations and attitudes are taken into account (Hopeniene, 2014). The most common reason for displeasure is the difference between an objective and the subjective evaluation of service delivery (Hopeniene, 2014). According to Parasuraman *et al,* (2015), Service Delivery processes assist staff in tailoring services to meet the specific business needs at a price the business can afford.

Logistics service delivery from the perspective of 'consumer benefits from lower transport costs' can be estimated by calculating the additional costs when a 'second

best' port would have to be used; these additional costs do not have to be incurred because of the presence of the port, thus they can be regarded as the benefits of the presence of this port. Due to the competition between ports, for instance competition between the port of Mombasa, Kenya and that of Dar-es-salam Tanzania it can be assumed that these benefits are passed on to the port users, and finally to the consumers in the hinterland, in this instance the hinterland being the east African land locked nations such as Uganda, Rwanda, Burundi, Ethiopia, and Southern Sudan. Even though some economic impact studies do argue along these lines, the benefits to consumers in the port hinterland are not presented explicitly. Some of the additional costs are as a result of bureaucracies within the port setting such as delays in loading and or offloading cargo, documentation processing delays by the port authorities, system breakdowns, long port customs procedures and even port staff apathy to work or just inefficiencies and lack of proper competencies.

Woo and Pettit (2010) states that logistics service delivery measurement framework, include timeliness, reliability, lead time, cargo damage and accuracy of information along with responsiveness, flexibility and claims. The international community has been increasing investment in projects that promote trade facilitation and improve logistics in the developing world, including ports. In Africa, a key motivation for such projects has been a presumption that poor infrastructure and inefficient border control agencies are the major causes of extended delays in sub-Saharan Africa (SSA) ports. Based on revelations it is argued that collusion between controlling agencies, port authorities, private terminal operators, logistics operators, and large shippers is an important part of the problem. Decreasing dwell times in ports requires governments to combat collusive practices between the private sector and public authorities and recognize that large-scale investments in infrastructure are not sufficient to reduce

logistics delays – (Raballand & Refas, 2012). Hummels (2011) demonstrated empirically that increased transport time dramatically reduces trade. Without rapid import processes, trade based on assembly operations for export is impossible: delays and unpredictability increase inventories and prevent integration into global supply networks.

According to Port community charter, monthly report (Feb, 2015) port dwell time drastically reduced from 5.17 days (123.96 hours) to 4.54 days (108.94 hours) in the month of February 2015. Nevertheless, the figures were still above the benchmarked cargo dwell time of 2 days (48 hours) at the port of Mombasa. Cargo Dwell Time is measured by the time that elapse from the time cargo offloaded at the port to the time goods leave the port premises after all permits and clearances have been obtained. KPA, in collaboration with other stakeholders was to achieve a dwell time below 3 days (72 hours) within 120 days after signing the Port Community Charter in June 2014. On the contrary, this has not been achieved yet. More importantly, there is need to improve port operations, speed clearance of cargo processes by all the stakeholders involved as well as cargo pick up from the port.

2.2 Theoretical Review

This study examined the human capital theory, resource based view theory, the queuing theory to understand the principles of port operations.

2.2.1 The Human Capital Theory

The postulation of the Human Capital Theory dates back in 1954 by Arthur Lewis. The human capital theory states that there is a positive correlation between value of services and goods with the capacity of the people involved. The definition of human capital according to the theory states that it is as unit level capacities of individuals (Ployhart

et al, 2004). Human Capital is also examined as an intangible and intellectual resource in an organization. Rothaermel (2012) conjectured that it's through the human capital aspect that systems, processes and routines are operated or become operational (SAKS, 2006).

The relevance of this theory pegs on the study objective of staff competence level. The staff competence level is dependent on the knowledge skills and exposure of the workmanship in the organization. The performance of staff in various logistical firms is largely dependent on the qualification, skill and training of the individual employed in an organization. The staff in an organization usually bring along three levels of human capital, organizational capital, the process capital and innovation capital. The three types of human capital are needed in various stages of the growth of the logistical firms involved in the maritime transport (Armstrong *et al*, 2010). It can be stated that when a logistical firm has the required staff that have right qualification, skills and undergone rightful training have the chance to excel in the market and survive hazy economic situations.

In as much as the theory is important to the staff competence level, it has various limitations. The first limitation as noted by Oliveira & Da costa (2014) is that this theory puts a lot of emphasis on education and earnings and had little in regards to the role of experience of the workmanship in an organization. Second limitations of the theory according to Acemogle & Pischke (2009) are that a lot of emphasis is put on skills and knowledge that are industry specific. This industry specific skills and knowledge as stated by Lewis are acquired through apprenticeship and vocational schools. Some of the industry specific skills and knowledge can also be applied in other non-related industries. Lastly, Heckman & Park (2012) stated that this theory ignores the roles of

non-cognitive abilities. The non-cognitive abilities have of the recent years been given more limelight because they shade more light on attitudes of individuals, mindset and general behavior.

2.2.2 Servqual Model

Servqual Model was originated by Parasuram, Zeithaml and Berry (1988) and it was based on disconfirmation paradigm. The model was based on the following service factors: tangibility, responsiveness, reliability, credibility, courtesy, security, communication, accessibility and understanding the customer. Pakurar, Haddad, Nagy, Popp and Olah (2019), narrowed down these factors into five, which include: reliability, assurance, tangibility, empathy and responsiveness assurance.

The SERVQUAL model proposes the use of the gap analysis or difference between expected level of service and delivered level of service for measuring service quality perception with five dimensions: reliability, responsiveness, assurances, empathy, and tangibility. SERVQUAL is an analytical tool, which can help in identifying the gaps between variables affecting the quality of the offering services (Seth, Deshmukh & Vrat, 2015). This model has a wide acceptance among marketing researchers and scientists, although it is an exploratory study and does not offer a clear measurement method for measuring gaps at different levels.

This model can be used to measure service quality of KPA, using various dimensions. These dimensions include: reliability is the ability to perform the promised service dependably and accurately; responsiveness is the willingness to help customers and provide prompt service; assurance is the knowledge and courtesy of employees and their ability to convey trust and confidence; empathy is the caring, individualized

attention; and tangibles covers the physical facilities, equipment and appearance of personnel (Zeithaml, Bitner, & Gremler, 2016).

2.2.3 The Queuing Theory

This theory was postulated by Agnes Krarup Erlang in the year 1909 when working as an engineer at the Copenhagen telephone exchange. According to this theory a system of queuing in an organization or firm should be designed in a way that it can be predicted in length of time for waiting (Zoran & Branislav, 2005). The queuing theory is applicable to day to day situations and also used in manufacturing and service industries. In order to construct the queuing system for a situation, there is great need to know the possible occurrences and chances. Therefore the knowledge of exponential and Poisson probability functions of distribution is worthwhile to be applied. The major component of a queuing system involves four major areas: the input source, the queue, the queue discipline and service mechanism (Wen-Chin *et al*, 2007).

The relevance of this theory encompasses the custom clearance process as an objective of study. There are three major categories of queuing patterns: single queuing nodes, simple two-equation queue and the queuing networks. The custom clearance process is best feature in the queuing network category. This is because the clearances of cargo at the port which are in queues and at various departments are usually connected to a single customer routing. Therefore, the cargo containers are queued as nodes creating complex nodes. The queuing system has been applicable in numerous sea ports across the globe (Zoran & Branislav, 2005). El-Naggar (2010) in study applied the queuing theory at the Alexandria port container terminal. The exponential probability distribution was applied in two sets: the arrival time of container cargo and service time of the container cargo.

2.2.4 Technology Acceptance Model

Davis (1989) presented a theoretical model aiming to predict and explain ICT usage behavior, that is, what causes potential adopters to accept or reject the use of information technology. Theoretically, TAM was based on the Theory of Reasoned Action (TRA). In TAM, two theoretical constructs, perceived usefulness and perceived ease of use, are the fundamental determinants of system use, and predict attitudes toward the use of the system, that is, the user's willingness to use the system. Perceived usefulness refers to "the degree to which a person believes that using a particular system would enhance his or her job performance", and perceived ease of use refers to "the degree to which a person believes that using a particular system would be free of effort" (Davis,1989).

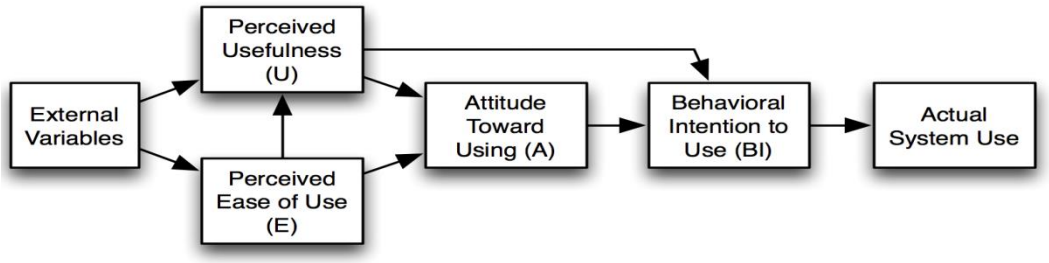

Figure 2.1: Technology Acceptance Model
Source: Davis 1989

Chuttur and Gilbert (2013) examined why organizations applies technology in warehouse management. In their work, the authors identified factors as reliable measures to characterize attitudes towards warehouse service delivery. Factors enabling positive attitude were; less time, cost and avoiding personal interaction (categorized as relative benefits); and factors characterizing negative attitudes were experience, information quality, financial security, low stress, trust and visual appeal. This theory can be used to explain the relationship between information technology and the service

delivery at the Port of Mombasa. The theory can also be applied by KPA and KRA in the adoption of Integrated Customs Management Systems (ICMS) in carrying out operations in custom bonded warehouses at various entry points.

2.3 Effect of Information System on the Service Delivery

Computerized information system that is user friendly to allow exchange of information amongst the firms at customs has helped to improve the entire clearance process. From lodging of entries, acceptance to processing of cargo, goods declarations for import and export, transit, assessment and payment of relevant taxes, to arrival of the goods to customs and border control (UNECE, 2012). Earlier researchers have also indicated that making trade procedures that are easy to follow coupled with faster transport and easier predictability of goods encourages developing countries to develop interest to participate in world trade which could bring on board all business ventures to international trade. As reported by (UNCEA, 2013) trade facilitation is a main factor in international trade proficiency and the economic growth of countries. Alongside with increased competition and pressures to raise efficiency has led to harmonization of the complex customs trade procedures by streamlining of trade procedures (Wulf & Sokol, 2005).

Information systems means hardware, software, telecommunications, databases and other technologies which are used by custom bonded warehouses to improve their performance or it means equipment, and procedures used to gather, sort, analyze, evaluate and distribute needed, timely and accurate information to decision makers (Autry, Griffis, Goldsby & Bobbit, 2015; Nedelko, 2018; Closs & Xu, 2010; Porter & Millar, 2011; Ho, 2016). The integration of information system in port service delivery and in particular consignment management holds great potential to unlocking the

efficacy of the port in today's economy by improving information sharing, increasing predictability, reducing waste in value chains, better monitor demand for certain products and place orders to prevent an out-of-stock situation, hence reducing bullwhip effects and lead time. ICT continues to be one of the most important enablers of effective service delivery in the Port of Mombasa (Samuel, 2012) and improves ports agility, reduces cycle time, achieves higher efficiency and deliver consignment to customers in a timely manner (Radjou, 2013).

Study Varila, Seppanen & Heinonen. Burinskiene (2012) showed that ports service delivery productivity could only be achieved by looking at the processes. Varila *et al* (2012) pointed out that in manual activities in the port, the forklift became the most expensive equipment because of labour, maintenance costs and equipment. The research suggested reducing duplicative or multiple handling of pallet, and non-productive movements and construction of routes. A great deal of interest in ports service delivery stems from the availability of information and the methods to analyze this information to reach meaningful results. Haag & Stephen, (2010) assert that the increasing importance of electronic business brings to fore new opportunities and the widespread use of internet makes ICT tools a source of competitive power for many ports around the world. Further, ICT has been adopted in store management processes by firms as a competitive edge and to build strategic long-term relationships along the supply chain. The presence and use of electronic devices is also noted as a worthwhile operationalization of information systems. In East Africa the latest launch of the electronic cargo tracking system is a vivid example of the use of the electronic devices and use of information system. The ECTS are designed in a way to relay the real time situation of the cargo in transit. Another element of the ECTS is that it enables containers after being inspected to be locked and made tamper proof. In case of theft or

accident the management at the port can be able to be notified and salvage the situation at hand (Barletta and Bichou, 2007).

The element of computerized container control system is also a service of the information systems. In the container terminals there are numerous containers with different destinations. The real time tracking of the containers at the port is enabled by the Differentiated Global Positioning Systems (DGPS). This tracks the containers and movement at the port. However, the GDPS in some situations it becomes inefficient like harsh and cloudy conditions (Hill & Scudder, 2002). To counter this situation other system such as optical based system can be used as an alternative. The optical laser system combines the use of radar and optical technology to achieve a better reliability of positioning of the containers at the port terminus. In relation to the container vessel within the port area, the location and positioning is done by use of the local Positioning System (LPS). The LPS basically uses low frequency radio navigation in transmitting the signals of stationery cargo vessels (Ashbrook *et al*, 2003).

2.4 Effect of Infrastructure Development on the Service Delivery

Infrastructure is the basic systems and services, such as transport and power supplies, that any port must possess in order to work effectively. Infrastructure in an economic setting is a component of the territorial structure of national economy, which is formed by the transport, communications, trade, energy and water management system, as well as dwellings, schools, objects of health protection, culture, sports and other objects for care of inhabitants and their arrangement in any territory (Saeima, 2010). The level of infrastructural development in port is usually measured by the container port throughput. The container port throughput is measured in TEU. There have been tremendous strides made in port infrastructure development in the last one decade. The

major development has been realized with average growth rate of 8% translating to 406.9 million TEUs. It is worthwhile noting that on average scale the Asian continent has taken lead in demand for container port services due to adequate port developments in infrastructure (Bacchiocchi, 2012).

Lakshmanan (2011) explained that investment into transport facilities improves logistics ability and reduces freight costs. Wilmsmeier & Hoffmann (2008) estimated the role of liner shipping connectivity (LSC) and port infrastructure in determining freight rates in the Caribbean. They found that a one-standard-deviation increase in LSC implies an expected reduction of USD 287 in freight rate, and that a one-standard deviation increase in port infrastructure for an importing country implies an expected reduction of USD 225 in freight rate. Furthermore, Sánchez *et al*. (2003) found that freight costs are lower in efficient ports after controlling for distance, liner service availability, and type of product and insurance costs. Also, an increase in port efficiency from the 25^{th} to the 75^{th} percentile is expected to reduce shipping costs by 12% (Clark et al., 2004). Quality of infrastructure and transport costs is important for export-led economic growth (Limao & Venables, 2001). Thus, it can be derived that efficient ports have better quality infrastructure and logistics performance than inefficient ones.

Additionally, an efficient port system with enhanced logistic abilities is a key determinant of foreign direct investment into a country (Panayides *et al*., 2015). On the other hand, inefficient ports reduce national and international trade and affect economic growth adversely (Clark *et al*., 2004). Also, the role of ports in the internationalization process of business firms was highlighted by Ellis (2011). A country's logistics performance plays a vital in facilitating transportation of goods to the international market. Korinek & Sourdin (2012) points out that "Inefficient logistics services impede

trade by imposing an extra cost in terms of time as well as money". Limao & Venables (2001) found a significant negative association between transport cost and international trade. Long customs clearance time adversely affects firms' total factor productivity (Subramanian *et al*., 2005).

Meanwhile, a better business environment comprising quality logistics services is associated with better export performance (Portugal-Perez & Wilson, 2012). Also, better accessibility of freight increases logistics employment (van den Heuvel *et al.*, 2014). Overall, firms in countries with better logistics performance have higher probability of exporting to international markets and attracting foreign direct investments (Hausman *et al*., 2013). Thus, logistics development has a positive impact on regional economic growth (Chu, 2012; Lean *et al*., 2014; Li *et al*., 2017; Lun *et al*., 2016). Coto-Millán *et al*. (2013) found that a 1% increase in logistic performance index can increase the world economic growth by between 1.1– 3.4%.

Ports are the hub and node of networks for all kinds of waterborne transport and link countries with rest of the world; thus, they promote transportation and distribution in the cheapest way. Ports are more than just an infrastructure that facilitates international trade; they also determine freight transport costs and help company's access international markets (Clark *et al*., 2004). Although the most visible economic contribution of ports was employment in the port, this has declined dramatically since the inception of containerization, although ports still contribute significantly to the overall economy in rather less visible forms. In this present era of globalization, products are usually produced far away from consumer markets, and raw materials for a single product are often sourced from several different countries. Also, vertical specialization has increased dramatically over the last two decades; that is, different

parts of the production function of a product are performed in different countries (Hummels *et al*., 2001).

2.5 Effect of Custom Clearance Process on the Service Delivery

Customs clearance procedures refer to a specialized procedures and processes designed to maintain uniformity and controls in cargo clearing process in custom bonded warehouses. Customs clearance procedures are common in maritime organizations such as KPA but the situation becomes more cumbersome when two or more organization have been involved, in this case KRA and KPA (Investopedia, 2018). Before the release of consignment to customers, there are procedures and process which must be followed by clients. The custom clearance process of ports is one of the great key performance indicators developed by the United Nations Conference on trade and Development (UNCTAD). In the year 1976, the KPI of port performance were majorly grouped into two: the operational performance indicator which entails the input-output measures of productivity and financial performance indicators that entails the aggregate impacts of the ports to the various economic activities over time. Various key port performance indicators have been designed. The key port performance indicators can also be generally grouped as: traffic, financial, custom procedures, security, operational and financial (UNCTAD, 2017).

The custom clearance process revolves around the nature of transaction in place: the import and export process. The presences of the check point facilities are vital in a port. This ensures that the goods/cargo meet the standards of international level. The second component of the check points is that it ensures the right levies and duties are actually paid as per the stipulated rules and regulations in place (ICC, 2010). Onwogu (2018) examined corruption and efficiency of custom clearance processes in selected countries,

where it was established that corruption causes a diversion of effort from clearance functions to unproductive services of negotiating bribe payments. It also established that improvements in port facilities will improve customs effectiveness. The relationship identified between corruption and the effectiveness of the customs service is robust and includes regulatory quality, government effectiveness and an alternative use of the corruption index.

The provision of custom clearance and quarantine services imposes high security procedures to access the dry port, similarly to seaports, and depending on the country it may include high fencing, cameras and guards (Roso & Lumsden 2010). The port of Mombasa is vital to Kenya's domestic economics. Maritime trade accounts for more than 70% of the port of Mombasa's total cargo volume, and that volume is growing at around 12% per year (KPA, 2010). A study by UNCTAD (2016) recommends that automation of the procedures reduces corruption by minimizing direct contact between Customs officers and traders, and significantly reduces the potential negative impact of physical inspections. "ICT applications can reduce waiting times at border crossing and at ports, secure appropriate processing of fees and Customs duties, simplify formalities, and provide timely information to transport operators. It also reduces transaction costs, enhances supply capacities, and increases global market access". Ondari (2016) established that the advantages of bureaucracy are many folds, apart from consistent employee's behaviour, it eliminates overlapping or conflicting jobs or duties and behavior of the system is predicable; thus, the study concludes that bureaucratic procurement procedures had a positive impact on the efficiency of inventory management among firms in Kisii town. This study concluded that bureaucratic procedures have an effect on successful store management.

2.6 Effect of Staffs Competence Level on the Service Delivery

Ports' staffs are the persons or individuals who are ultimately responsible for the day-to-day operations or management of ports. Managers of the port are responsible for the various members of the staff and team who report to him and enable the smooth functioning of the day-to-day operations of the store. On the other hand he also has to ensure that the policies and the guidelines as laid down by the management, are adhered to by the store and all employees within the store .typically, the store manager is responsible for all the activities that are conducted within the environs of the store and would include the opening of the store on time, scheduling of staff, cleanliness, ensuring adequate stock on the floor, closing of the store and also dealing with the customer grievances and complaints (Bobhips, 2015).

A lot of studies have been conducted to study the role of human resource development activities in logistics management and organizational performance. Delaney and Huselid (2014) conducted a survey in 590 profit and non-profit firms and found that human resource management (HRM) practices like training, staff selectivity, and incentive compensation are positively related to perceptual measures of organizational performance. Sum (2016) studied the effect and the role of training in business strategies and found that training function is a value-added source for sustained competitive advantage, and the training activities should be aligned with corporate objective and goals. Okeudo (2017) conducted a study in Nigeria by collecting data from logistics service provider (LSP) and concluded that recruitment and selection, performance appraisal, training and development, health and safety of employee compensation and benefits have a significant and positive impact on firm performance. Also, that if these LSPs increase their human capital investment, by off and on job training, they will be able to improve their performance.

For effective performance of store and warehouses training is necessary not only for the management but also for the subordinates. The actual performance of the store's employee was linked with the commitment of the organization and that was be improved by giving them training. To improve the performance of the employees the level of organizational commitment and to measure the level of commitment towards organization scales was made by (Keat, 2013). It also said that the employee's performance is more effective if he/she was trained Nyabwanga, (2013). It has also been demonstrated that commitment of employees would increase by letting them participate in developing the programs (Sharma, 2009). As evidenced in the studies training increases the performance of the employees. If an organization wants to develop the competitive edge, then training help the organization to get the edge when employees are highly developed with the help of training in their work and it help the organization to retain the core competences.

2.7 Research Gaps

Much research effort has been targeted particularly at capacity utilization and integration of port activities on the supply chain but limited effort has been geared towards explaining which determinats of service delivery at the port of Mombasa. There is little explaining on the factors which determine performance. Information technology, staff training and expertise and customs clearance procedures played a major role in enhancing performance of custom bonded warehouses. Studies done previously did not clearly elaborate how implementation of this factors can lead successful performance of custom bonded warehouses and improve operations efficiently. The studies failed to explain the strategies that should be embraced by public institutions such as KRA and KPA for successful implementation of custom clearance procedures. The study has highlighted emerging issues from various studies reviewed

indicates mixed results that are inconclusive especially for developing countries like Kenya. Additionally, previous have not provided sufficient justification on the link between determinants of service delivery, therefore this study tries to bridge this gap, by establishing the determinats of service at the Port of Mombasa.

2.8 Conceptual Framework

The conceptual framework entails the use of the independent variable and the dependent variable. The study independent variables for the study are: Information System, Infrastructure, customs clearance process (KRA) and staff competence level. In relation to dependent variables it is the performance of service delivery of the logistical firms at the port of Mombasa.

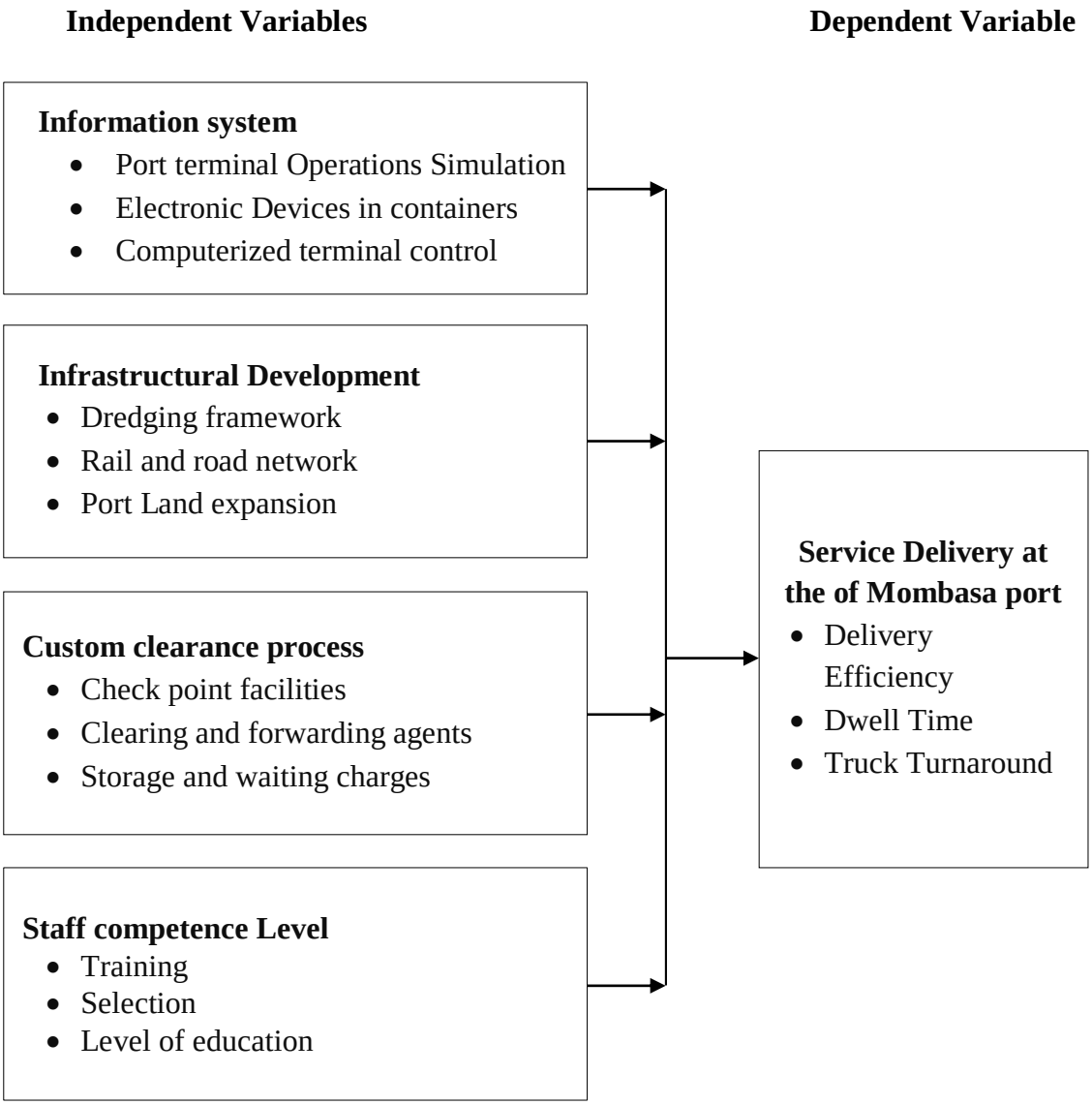

Figure 2.2: Conceptual Framework
(Source: Author, 2018)

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

This chapter aims at explaining the research methods or instruments used in collecting the data. It describes the research design, the population and sample size, the sampling techniques, data collection methods and procedures and finally data analysis and presentation.

3.1 Research Design

The research adopted explanatory research design. The preference of this research design is due to the fact that this research area had not been previously researched on hence the need of an in-depth portrayal of service delivery logistical issues at the port. Some of the characteristics in service delivery logistical performance are perceptions, beliefs, opinions and the knowledge (Cooper & Schindler, 2005). The use of explanatory research design allows the researcher to describe what deems meaningful and not restricting the study to predetermined categories. It creates room for high credibility whereby the researcher can probe for more details that ensures the participants interpret questions as intended.

3.2 Study Area and Target Population

A target population refers to an entire group of persons or elements that have common characteristics (Kombo & Tromp, 2006). Bryman & Bell (2015) defines target population as “a complete set of individuals with some common characteristics which the researcher wants to generalize the results of the study”. The population of the study was 1200 port stakeholders from clearing and forwarding, shipping agents, transport and logistics, and warehousing at the port of Mombasa was the study area. The

composition had a competitive business drive that makes them aware of the world industry trends and best practices. According to Peers, (1996), when dealing or using smaller groups of people to make inferences about larger populations views, it is vital to pick a larger sample to deal with nonresponsive bias which is essential.

Table 3.1: Target Population

Category	Target Population
Clearing & Forwarding	520
Shipping Agents	220
Transport and Logistics Firms	360
Warehousing Firms	100
Total	**1200**

Source: KRA, KPA, 2019

3.3 Sample Frame

A sample frame is a physical representation of the target population, and it comprises of all potential elements of a sample (Kothari, 2014). The study considered employees from four different firms (clearing and forwarding Mombasa, shipping agents in Mombasa, transporters (logistics firms in Mombasa) and warehousing firms) from which a sample of the study was drawn.

3.4 Sample and Sampling Technique

Sampling is the method toward choosing a few components from a population on behalf of the whole population under study (Cooper and Schindler, 2006). The researcher was determine/asses the determinants of service delivery at the port of Mombasa using questionnaires. The researcher administered questionnaires to selected representatives who were divided into three stratus. From the target population of 1200 employees from the logistical firms, a sample size of 137 was obtained using the stratified random sampling as far as service delivery operations at the port of Mombasa is concerned.

The Slovene's formula was used to determine sample size is indicated below. In this study a 95% confidence level and p = 0.5 will be assumed.

$$n = \frac{N}{1 + N(e)^2}$$

Where ***n*** is the sample size, **N** is the population size, and e is the level of precision.

Applying the formula,

$$n = \frac{1200}{1+1200(0.05)^2} = 137$$

Therefore; the sample strata summary will be as shown in the table below

Table 3. 2: Sample Size

Category	**Target Population**	**Sample Size**	**Sample Percentage**
Clearing & Forwarding	520	59	43%
Shipping Agents	220	25	18%
Transport and Logistics Firms	360	41	30%
Warehousing Firms	100	12	9%
Total	**1200**	**137**	**100%**

Source: KRA, KPA, 2019

Stratified sampling technique was used since the subsamples vary in terms of marine operation thus each stratum should be dealt with separately. Mugenda & Mugenda (2008) defined stratification as the process of assembly individuals from the population into generally homogeneous subgroups before sampling. This commonly helps in reducing sampling error.

3.5 Data Collection Instruments

3.5.1 Primary Data Collection

Primary data was collected for the first time, and it was best suited as it was timely, more relevant to specific research problem at hand hence being preferred (Creswell, 2013). The study used structured questionnaires to collect data. Researchers preferred this instrument because it gives the respondent a common margin of response hence making it easy for the analysis. A structured questionnaire was segmented into two parts. Part one which was about the general information of the respondents while the other part was involved the objective variables and dependent variables questions. The questions in part two were designed using a 5-point Likert scale ranging from 1 to 5. They are most convenient for descriptive studies as they rate the respondent's perception about the subject under study (Saunders, et al. 2009).

3.5.2 Data Collection Procedure

The various stakeholders were briefed concerning the purpose of carrying out the study. The data collection procedure involved getting authorization letter from the Chairman of Department at Moi University, Mombasa Campus and from the stakeholder's outlets in order to begin data collection. Copies of the permit were then distributed to the administration of various stakeholders in the categories to gather information. The researcher employed drop and pick method, where printed questionnaires given to targeted respondents so that they can fill at their own convenient time. Follow ups was be made through phone call after which the filled questionnaires was be collected after one week

3.6 Pilot Testing

The purpose of piloting of instruments is to establish the clarity of meaning and the comprehensibility of each of the items in the research instrument (Sindabi, 1992). According to Cooper and Schindler (2013) a pilot test helps to detect weakness of the instruments used in the study and to provide proxy data for selection of a probability sample. Pilot testing also provides an opportunity to detect and correct any anomalies to the research instrument (Fraser, 2018). This is done to ensure that appropriate questions are asked, the right data is collected, and the data collection method is applicable. A pilot study will be undertaken on 14 respondents to test the reliability and validity of the questionnaire. The rule of thumb is that 10% of the sample should constitute the pilot test (Lee, 2014).

3.6.1 Data Reliability

Reliability of the scale testing is very important as it shows the extent to which a scale produces consistent and coherent results after testing repeatedly (Bolarinwa, 2015). Cronbach's alpha was used to determine the internal reliability of the questionnaire that was used in the study. To achieve this 10 participants were selected randomly to fill the questionnaire to determine the association between scores obtained from different tests of the scale. Data was coded and analyzed using SPSS version 23. If the association is high, and consistent the result is deemed reliable. Caution was taken to ensure that the selected 10 participants were not involved in the main study so as to reduce element of biasness. According to (Kothari & Garg, 2018) values of the test ought to range between 0 and 1.0. A test result of 1.0 indicates perfect reliability, however a value 0.7 is deemed to be the lowest level of acceptability. Researcher carried out the reliability test using 10 questionnaires. The ten questionnaires were then taken and coded and analyzed using SPSS version 23.

3.6.2 Validity of Data

For the validity of the instruments, the researcher ensured that the questions are in conformity with the study objectives. Expert opinions were sought from quality experts to evaluate the relevance, wording and clarity of questions in the instrument as recommended by Gay (2006). Construct validity was achieved in accordance with the theoretical constructs n the literature review. The variables of the study were operationalized to reflect the theoretical assumptions that underpinned the conceptual framework for the study. The study relied on instruments developed in other related studies as well as concepts generated from a broad range of appropriate literature (Arumugum *et al*., 2008).

3.7 Data Analysis and Presentation

Zikmund, Babin, Carr & Griffin (2017) defined data analysis as "an application of reasoning to understand the data that has been gathered with the aim of determining consistent patterns and summarizing the relevant details revealed in the investigation". According to Silvia Skilling (2016) data analysis helps to determine its relevance including whether it can be used to make good decision. The collected questionnaires were coded and analyzed using Statistical Package for Social Sciences (SPSS) to generate data for analysis and presentation. A Likert scale was adopted to provide a measure for qualitative data. The scale helped minimize the subjectivity and make it possible to use quantitative analysis. The numbers in the scale was ordered such that they indicate the presence or absence of the characteristic to be measured (Kothari & Garg, 2018). Descriptive statistics was to present frequency while inferential statistics was used to present correlation, multiple regression analysis, ANOVA and model summery to establish the relationship among the study variables. Tables were used to present result findings of analyzed data. The study is expected to produce both

quantitative and qualitative data. Therefore, both descriptive and inferential statistics was used to analyze the data. Qualitative as well as quantitative methods of data analysis were used to analyze the research variables (Leung, 2015). The regression analysis of the dependent and independent variables was determined using the regression model as shown below.

The regression analysis model is:

$$\mathbf{Y= \beta_0+ \beta_1X_1+ \beta_2X_2+ \beta_3X_3 +}e$$

Where;

Y = Service Delivery

β_0= Regression intercept (value of **y** when the X_i are Zero)

β_{is}= Regression coefficients determining X_i on how they affect y

X_1 = Information System,

X_2 = Infrastructure,

X_3 = Custom Clearance Process,

X_4 = Staff Competence level,

β_0 β_1 β_2 β_3 β_4 are the coefficient of the variables.

e = is the error term. The assumptions of the regression model shall be:

3.7.1 Measurements of Variables

Variables that could not be easily measured was operationalized to make them measurable through their reduction into measurable dimensions. The measurement of variables in this study were conceptualized as provided in Table 3.3.

Table 3.3: Operationalization of the Study Variables

Variables	Type	Measurement
Service Delivery	Dependent variable	• Delivery Efficiency • Dwell Time • Truck Turnaround
Information systems	Independent variables	• Simulation of port terminal operations • Electronic devices in containers and • Computerized terminal control
Infrastructure development	Independent variables	• Dredging framework • Rail and road network • Port Land expansion
Customs clearance process	Independent variables	• Check point facilities • Clearing and forwarding agents • Storage and waiting charges
Staff competence level	Independent variables	• Training • Selection • Level of education

3.7.2 Assumptions of Regressions

Testing of independent variables, moderator and dependent variable was possible since normality and linearity assumptions of regression model was considered. Regression assumes that variables have normal distribution. Non- normally distributed variables with substantial outliers can distort relationships and significant tests. Shapiro-Wilk test was used to test for normality, owing to its superiority compared with Kolmogorov-

Smirnov test, since it holds large data. Where, non-significant results (> 0.05) showed the data fits normal distribution.

Linearity implies that the mean values of the outcome variable for each increment of the predictor(s) lie along a straight line. Correlation analysis can be used to assess association between predictor and criterion. Pedhazur **(**1997), Cohen and Cohen (1983) and Feldman (1985) suggested the use of examination of residual plots. However for this study, correlation coefficient will be used.

The other assumption of regression is Multi-collinearity, which is a term used to describe the inter-correlations or inter-associations among the independent variables. Multi-collinearity can be detected with the help of tolerance and its reciprocal variance inflation factor (VIF). Tolerance should be above 0.20 (Menard, 1995) and this will be the cut-off value for this study. Serial autocorrelation test was carried out through Durbin-Watson statistics where a statistical value of between 1.50-2.50, was accepted.

3.8 Ethical Issues

To ensure ethical issues are taken into consideration, research plagiarism and fraud was avoided, and information given by respondents on questionnaires and interviews was be treated with confidentiality.

3.8.1 Limitation of the study

The limitation of the study are inherently linked to the disadvantages of the data collections techniques and primarily to the disadvantges associated with the use of questionnaires sometimes questionnaires respondents may not correctly grasp the intent of the question thus giving out irrelevant answers. Some respondents may introduce bias into the study through answering questions based on personal prejudices as opposed to objectivity of the study.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSIONS

4.0 Introduction

This chapter presents an analysis and discussion of the data gathered from managers and employees. The data was collected through structured questionnaires. This chapter is sub divided according to the study objectives and findings presented using tables and figures. This presents the finding of the analysis based on the necessity to investigate determinants of service delivery at the port of Mombasa, Kenya. The study will be guided by Service Delivery variables: to examine the effect of information system on service delivery at the Port of Mombasa; to determine the effect of infrastructure on service delivery at the Port of Mombasa; To assess the influence of custom clearance process on service delivery at the Port of Mombasa, and to determine the influence of staff competence level on service delivery at the Port of Mombasa. The study will also seek to test the null hypothesis of the findings. SPSS 23 will be used for data analysis. Thereafter, the chapter will give a discussion of the analyzed results; relating them on how they affect individual, county, country and world levels. The results will be presented inform of tables with reliability test, correlation and regression models being used in the study.

4.1 Response Rate

A total of 137 questionnaires were administered to the stakeholders of KPA (clearing agents, managers of warehousing firms and logistics and transport firms and shiping agents) of which 115 were filled and collected. This gave a response rate of 84%. According to Babbie (2014), a return rate of 50% is acceptable and fit to analyze and publish, as 60% is good while70% is ranked very good.

Table 4.1: Response Rate

Response Rate	Frequency	Percentage
Responses	115	84%
Non-Responses	22	16%
Total	**137**	**100%**

4.2 Pilot Testing

4.2.1 Reliability Testing

Reliability is the extent to which an instrument gives a consistent and coherent result after carrying out several tests (Camps & Cattuzzo, 2017). The study carried out a reliability using Cronbach's coefficient alpha (α) to determine the instrument's capabilities. This was done using a test-retest technique at different points to establish the strength of association of the test scores (Kothari, 2011). SPSS was used to analysis data and results were presented as shown in Table 4.2 below, and going by Griethuijsen (2014) observation that a value of 0.7 or 0.6" is accepted as a threshold or cut-off, the test were found reliable as indicated in Table 4.2 below.

Table 4.2: Reliability Test

	Cronbach's Alpha	Items	Comments
Information System	0.715	5	Reliable
Infrastructure development	0.733	5	Reliable
Custom Clearance Service	0.744	5	Reliable
Staff Competency	0.716	5	Reliable
Service Delivery	0.705	5	Reliable

4.3.2 Validity

Validity refers to the extent at which generated results reflect a true reality. The questionnaire used was simplified in a language that all participants were familiar with.

And, to determine internal validity of a questionnaire, researcher did a pilot test, where 10% of respondents from the targeted population were selected to fill the questionnaire. The results of the pilot test established that the questionnaire was relatively easy to answer as the questions were well understood by the participants.

4.3 Demographic Analysis

In trying to assess the demographic characteristics of the respondents, the study used; gender, age brackets of respondents, and work experience to investigate determinants of service delivery at the port of Mombasa, Kenya. Result findings were tabulated as follows;

4.3.1 Work Experience

The study sought to investigate the experience of the respondents in the organization. With their experience and exposure, they would enable respond fairly to the questionnaire pursuing to unveil the investigate determinants of service delivery at the port of Mombasa, Kenya. Results findings were as shown Table 4.3 below.

Table 4.3: Work Experience

		Frequency	**Percentage**
Valid	< 1 yr	19	16.5%
	1-5 yrs	24	20.9%
	6-10 yrs	46	40%
	>10 yrs	26	22.6%
Total		**115**	**100%**

Table 4.3 above shows results finding. As indicated, 16.5% of the respondents had worked for less than 1 year, 20.9% had between 1-5 years, 40% had worked between 6-10 years, and finally 22.6% had worked over 10 years. This demonstrates that the majority of respondents had work experience between 6-10 years, implying that they were conversant with determinants service delivery at the port of Mombasa, Kenya.

4.3.2 Age Bracket

The study tried to place the respondents in their age brackets. A factor that authenticates their participation in this project: The investigate determinants of service delivery at the port of Mombasa, Kenya. Results findings were as indicated in table 4.4 shown below.

Table 4.4: Age bracket of respondent

		Frequency	Percentage
Valid	20-29 years	12	10.4%
	30-39 years	25	21.7%
	40-49 years	31	27%
	50-59 years	24	20.9%
	>60 years	23	20%
Total		**115**	**100%**

The findings showed that 10.4% of the respondents felt between 20-29 age bracket, 21.7% felt between 30-39 age bracket, 27% felt between 40-49 age bracket, 20.9% between 30-59 age bracket, and finally 20% were over 60 years. From the above findings, it reveals that the majority of the respondents are between 40-49 ages brackets which are an active age of production.

4.4 Descriptive Analysis

The respondents were asked to give their opinions, and were rated using a five point Likert scale which ranges from 1 to 5, where; 1 = Strongly Disagree, 2 = Disagree, 3 = Neither Agree, 4 = Agree, and 5 = Strongly Agree. The subsequent analyses for the mean and standard deviation were thus predicated on this data.

4.4.1 Information System

The first objective of the study was to examine the effect of information system on service delivery at the Port of Mombasa. Respondents were asked to state their opinions regarding the extent to which information system has affected service delivery at the Port of Mombasa. The results were as shown in table 4.5 below.

Table 4.5: Information System

	N	Mean	Std. Deviation
There is existence of electronic devices on the containers	115	3.85	.920
There is computerized terminal control systems in place	115	4.01	.793
There is information exchange amongst the firms at the port	115	4.73	.582
The information system used at the port for operations is user friendly.	115	4.27	.798
There is training done for improvement of infor, exchange amongst the key players in logistical operations.	115	4.52	.612
Overall mean		**4.27**	

Refereeing to results findings in Table 4.5, the statement that there is existence of electronic devices on the containers had a (mean=3.85, SD=.920). The statement on whether there is computerized terminal control systems in place had a (mean=4.01, SD= .793). This is in support of Barletta & Bichou (2007) who explained that the launch of electronic devices and use of information system to track cargo has enabled management at the port to minimize theft cases or incase of accident the management are notified in time to salvage the situation. Respondents were further asked on whether there is information exchange amongst the firms at the port which they strongly agreed with a (mean=4.73, SD=.582). With a (mean=4.73, SD=.582), respondents were also agreement that the information system used at the port for operations is user friendly. Finally, were in agreement with a (mean=4.52, SD=.612) the training is usually done for improvement of information exchange amongst the key players in logistical operations. The table shows that the responses had an overall mean score of 4.27 which is greater than 3.0. This implies that information system has the potential to improve

service delivery and performance at the port of Mombasa. This in support of respondents views who largely agreed that there is information exchange amongst the firms at the port which has improved information sharing, hence service delivery. This concurs with (Autry, Griffis, Goldsby & Bobbit, 2015; Nedelko, 2018; Ho, 2016) who observed that integration of information system holds great potential in unlocking the efficacy of the port by improving on information sharing, increasing predictability and reduction of waste in value chains.

4.4.2 Infrastructure Development

The second objective of the study was to determine the effect of infrastructure development on service delivery at the Port of Mombasa. To gauge their responses, respondents were asked to state their opinions regarding the extent to which infrastructure development has affected service delivery at the Port of Mombasa. The results findings were as shown in Table 4.6 below.

Table 4.6: Infrastructure Development

	N	Mean	Std. Deviation
There is dredging framework at the port	115	4.36	.638
The is rail and road network is well established	115	4.87	.338
There has been terminal construction and expansion	115	4.10	.466
There is aspect of incorporating newer port facilities	115	4.58	.562
Infrastructural development has led to increase in container throughput at the port	115	4.80	.402
Overall mean		**4.54**	

Refereeing to results findings in Table 4.6, the statement that there is dredging framework at the port had a (mean=4.36, SD=.638). The statement on whether there is rail and road network is well established had a (mean=4.87, SD= .338). Respondents were further asked on whether terminal construction and expansion has improved efficiency at the port which respondents strongly agreed with a (mean=4.10, SD=.466). This concurs with Daniel & Harback (2016) observations that construction and expansion improves terminals efficiency to provide competitive advantages to lure more ships. This concurs with Daniel & Harback (2016) observations that construction and expansion improves terminals efficiency to provide competitive advantages to lure more ships. With a (mean=4.58, SD=.562), also respondents strongly agreed that there is aspect of incorporating newer port facilities at the port of Mombasa. Finally, respondents were in agreement with a (mean=4.80, SD=.402) that infrastructural development has led to increase in container throughput at the port. This explains why in last one decade the port has realized an average growth rate of 8% translating to 406.9 million TEUs after improvement in port infrastructures. In support of this Limao & Venables (2001) acknowledged that quality of infrastructures are important for export-led economic growth, hence efficient ports with better quality infrastructure and logistics performance better than inefficient ones. Table 4.6 above indicates that the responses had an overall mean score of 4.54 which is greater than 3.0. This implies that infrastructure development play a significant role in delivery of services. From analysis, it means that with a well-established infrastructural development (rail, road networks and dredging) has the potential to improve service delivery and performance of the port at Mombasa.

4.4.3 Customs Service Clearance

The third objective of the study was to determine the influence of staff competence level on service delivery at the Port of Mombasa. Respondents were asked to state their opinions regarding the extent to which customs service clearance has affected service delivery at the Port of Mombasa. The results findings were as shown in Table 4.7 below

Table 4.7: Customs Service Clearance

	N	Mean	Std. Deviation
There are sufficient check point facilities at the port	115	3.96	.627
There are enough clearing and forwarding agents At the port	115	4.24	.696
The storage and waiting charges are fair to users.	115	4.63	.626
There is good mapping and directions at the port	115	4.80	.402
The custom clearance process is easier to Comprehend to the logistical key players at the port	115	4.72	.555
		4.47	

Refereeing to results findings in Table 4.7, the statement on whether there are sufficient check point facilities at the port that there is dredging framework at the port had a (mean=3.96, SD=.627). In agreement with this (ICC, 2010) explains that the presences of the check point facilities are vital in a port to ensure the right levies and duties are paid as per the stipulated rules and regulations in place. The statement that there are enough clearing and forwarding agents at the port had a (mean=4.24, SD= .696). Ffurther respondents were asked storage and waiting charges are fair to users which respondents strongly agreed with a (mean=4.63, SD=.626). With a (mean=4.63, SD=.626), respondents were also agreed with a (mean=4.80, SD=.402) that there is good mapping and directions at the port. Finally, with a (mean=4.80, SD=.402) respondents were in agreement that infrastructural development has led to increase in

container throughput at the port. With an overall mean of 4.47, as indicated in Table 4.7 above it can be deduced that with sufficient check point facilities, enough clearing agents, fair charges on storage, easier clearance procedures and good mapping have a significant effect on service delivery offered at the port of Mombasa.

4.4.4 Staff Competency

The forth objective of the study was to determine the influence of staff competence level on service delivery at the Port of Mombasa. Respondents were asked to state their opinions regarding the extent to which staff competency has affected service delivery at the Port of Mombasa. The results findings were as shown in Table 4.8 below.

Table 4.8: Staff Competency

	N	Mean	Std. Deviation
There is sufficient training of staff	115	4.01	.656
There is appropriate mode of selecting workers	115	4.26	.497
The level of education determines the competency Level of staff	115	4.80	.402
International standard qualification and standards are adhered in course of selecting and training staff	115	4.23	.753
There is sufficient consultation by the logistical key Players for minimum requirements for qualification Of members at the port.	115	4.46	.551
Overall mean	115	**4.35**	

The statement that there is sufficient training of staff had a (mean=4.01, SD= .656). On whether there is appropriate mode of selecting workers had a (mean=4.26, SD= .497). Respondents strongly agreed with a (mean=4.80, SD= .402) that the level of education determines the competency level of Staff. On whether international standard qualification and standards are adhered in course of selecting and training staff had a (mean=4.23, SD=0.753. Finally, with a (mean= 4.46, SD=.551) respondents agreed that

there is sufficient consultation by the logistical key players for minimum requirements for qualification of members at the port. With an overall mean of 4.35 which is greater than 3.0, it implies that staff competency has significant effect on provision service delivery port of Mombasa. From the analysis it can be deduced that training of staff, level of education and adhering to international standard qualification in selecting and training of staff has a bearing in delivery of service at the port. Thus, the findings suggest that the organization need to identify and develop specific staff competency that is tailored towards provision of excellent service at the port of Mombasa.

4.4.5 Service Delivery

The main objective of the study the main objective of this study is to establish determinats of service delivery at the Port of Mombasa. The respondents were asked to state give their opinions on the following statements as indicated in table 4.9 below regarding determinants of service delivery at the Port of Mombasa.

Table 4.9: Service Delivery

	N	Mean	Std. Deviation
Cargo delivery efficiency is having a negative effect On the cost of doing business at the port of Mombasa	115	4.00	.227
The current cargo delivery time at the port of Mombasa is not satisfactory	115	4.94	.240
The port operating hours convenient to all there Customers	115	4.43	.497
The port respond to customers' requests and Complaints promptly	115	4.59	.528
It is possible to have a lower dwell time than the Current dwell time at the port.	115	4.47	.501
Overall mean	115	**4.49**	

Examining results findings on Service Delivery as shown on Table 4.9 above, it reveals that service delivery on cargo at port of Mombasa having a negative effect on the cost of doing business at the port. This is indicated by a mean score of (mean=4.00, SD=.227). In line with this respondents also strongly agreed with a (mean=4.94, SD=.240) that the current cargo delivery time at the port of Mombasa is not satisfactory. However, it was strongly agreed as indicated with a mean of (mean=4.43, SD=.497) that the port operating hours convenient to all their customers. On whether port respond to customers' requests and complaints promptly had a (mean=4.59, SD=.528).Finally, respondents were asked on whether it is possible to have a lower dwell time than the current dwell time at the port to which respondents agreed with a (mean=4.47, SD=.501). From analysis it can be concluded that inefficiency in cargo delivery in terms of time has a negative effect on service delivery at the port. Additionally prompt handling of customers complaints will reflects positively to performance of the port.

4.5 Correlation Analysis

In trying to establish the relationship between the dependent and independent variables, the study carried out a correlation analysis which involved coefficients of correlation and determination. The coefficient correlation was computed to establish the strength of the relationship between dependent and independent variables (Kothari and Gang, 2014). The study used Pearson Bivariate correlation coefficient to determine the correlation between the dependent variable, service delivery, and the independent variables; information system, infrastructure development, customs clearance services and staff competency. According to Sekaran (2015), correlation between the variables is supposed to take a linear trajectory with its coefficient ranging from -1.0 (perfect negative correlation) to +1.0 (perfect positive relationship).

Table 4.10: Pearson Correlations

	S Delivery	InfoSystem	Infrastructure	C Service	S Competency
SDelivery	1				
Sig. (2-tailed)					
InfoSystem	.741**	1			
Sig. (2-tailed)	.000				
Infrastructure	.777**	.926**	1		
Sig. (2-tailed)	.000	.000			
CService	.743**	.917**	.959**	1	
Sig. (2-tailed)	.000	.000	.000		
SCompetency	.551**	.768**	.803**	.845**	1
Sig. (2-tailed)	.000	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed).
InfoSystem (Information System), Infrastructure Development, CService (Customs Clearance Service).

The results findings as tabulated in Table 4.10 above, indicates that there was a positive and significant correlation between the independent variables; information system, infrastructure development, customs clearance services and staff competency, and the dependent variable, service delivery. The analysis indicates that Pearson correlation (*r*) data analysis yielded a positive correlation coefficient (*r*) equal to 0.741, 0.777, 0.743 and 0.768 for information system, infrastructure development, and customs clearance services and staff competency, respectively. This illustrates that that there is a positive and significant relationship between the independent variables and dependent variable.

4.6 Test for Regression Assumptions

Prior to running a multiple regression analysis, normality, homoscedascity and serial autocorrelation tests was done. This was performed to avoid spurious regression results from being obtained.

4.6.1 Normality Test

Normality of the distribution was assessed using statistical method. Shapiro Wilk was used to test normality of the data because it can handle sample sizes as large as 2000. This study adopted Shapiro-Wilk test owing to its higher power compared with Kolmogorov-Smirnov test as recommended by Ghasemi and Zahedisl (2012).

Table 4.41: Shapiro-Wilk Tests

Variable	Statistics	df	Sig
Information System	.934	115	.132
Infrastructure Development	.968	115	.881
Customs Clearance Service	.971	115	.691
Staff Competency	.960	115	.433
Service Delivery	.958	115	.393

According to Ghozali (2015), normality can be detected by looking at the p-value of Shapiro-Wilk test. If the p-value is greater than the 5% significance level, the residuals are considered as normally distributed. If it is below 0.05, the data significantly deviate from a normal distribution. The test statistics of the independent, moderating and dependent variables are shown in the Table 4.11, where Shapiro Wilk test performed showed that the p-values range from 0.132 - 0.881 which were greater than 0.05, hence the data was normally distributed.

4.6.2 Serial Autocorrelation Test

Durbin-Watson statistics was used to test the presence of serial correlation among the residuals, the assumption of independence of errors, which required that the residuals or errors in prediction do not follow a pattern from case to case. The value of the Durbin-Watson statistic used to test independence and variance ranges from 0 to 4 and as a rule of thumb, the residuals are not correlated if the Durbin-Watson statistic is approximately 2 and an acceptable range is 1.50-2.50 (Hair *et al*., 2016). However, the acceptable values in Durbin and Watson's (1951) original paper as a very conservative rule of thumb, values less than 1 or greater than 3 are definitely cause for concern. The Durbin- Watson statistic was shown in Table 4.13, was.1.578. All the values were within the acceptable range indicating that the residuals were not correlated.

4.6.3 Multi-Collinearity

This term is used to describe the inter-correlations or inter-associations among the in variables. Thus, Multi-collinearity occurs when more than two independent variables are highly correlated (Cooper & Schindler, 2016). Multi-collinearity can be detected with the help of tolerance and its reciprocal variance inflation factor (VIF). Tolerance should be above 0.20 (Menard, 2005) and this was the cut-off value for this study. It is clear that serious multi-collinearity occurs when the value of tolerance is smaller than 0.10 and the value of VIF is greater than 10 (Ghozali, 2015).

Table 4.12: Multi-Colinearity for the Study Variables

	Collinearity Statistics	
Variables	**Tolerance**	**VIF**
Information System	.940	1.052
Infrastructure Development	.910	1.086
Customs Clearance Service	.887	1.125
Staff Competency	.916	1.090

All variables had tolerance values of above 0.2 and VIF of less than 10. This indicated that multi-collinearity among variables was not a problem and the proposed model in chapter three was valid. Admittedly, all the variables used in the multiple regressions' models had the tolerance values of above 0.20 showing Multi-collinearity was not a problem in this study as indicated in Table 4.12.

4.7 Regression Analysis

4.7.1 Coefficient of Determination (R2)

The independent variables were subjected to linear regression analysis in order to measure the success of the model and predict causal relationship between the independent variables; information system, infrastructure development, and customs clearance services and staff competency, and the dependent variable, services delivery.

Table 4.13: Model Summary

	Model R	R Square	Adjusted R Square	Std. Error of the Estimate	D-W
1.	.791a	.625	.611	.729	1.578

a Predictors: (Constant), Staff Competency, InfoSystem, Infra_Development, Cust_Clearance_Service

As shown in Table 4.13, the model explains 62.5% of the variance (Adjusted R Square = 0.611) on service delivery at port of Mombasa. This reveals that apart from the four studied variables, there are other determinants which can be used to predict service delivery in this model. However, as pointed out by Cooper & Schinder (2013), this is still a good model acceptable in social science since adjusted R^2 value is not lower than 0.10 (Tabachnick & Fidell, 2012). Since the model explains 62.5% of the variance, the rest 37.5% is explained by other determinants not studied in this research. In summary the four determinants studied namely; customs clearance services and staff competency, and the dependent variable, services delivery, and the dependent variable service delivery, determines 62.5% of the relationship while the rest 37.5% is explained by other determinants.

4.7.2 Analysis of Variance (ANOVA)

To determine the significance of the determinants of service delivery at Kenya Ports Authority and significance of equation 3.1, the study used ANOVA analysis.

Table 4.14: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	97.590	4	24.398	45.851	.000b
	Residual	58.531	110	.532		
Total		156.122	114			

a Dependent Variable: Service Delivery
b Predictors: (Constant), Staff Competency, Information System, Infrastructure Development, Customs Clearance Service.

The ANOVA model showed ($F\{4,110\}= 45.851$; $p=0.000$), the analysis indicated that the model was statistically significant since p-value<0.05 and hence equation 3.1 was

significant. Hence the determinants (Staff Competency, Information System, Infrastructure Development, Customs Clearance Service) significantly determines service delivery at Kenya Port Authority.

4.7.3 Regresion Coefficients

The findings in Table 4.15 shows the relationship between independent variables (Staff Competency, Information System, Infrastructure Development, Customs Clearance Service) and dependent variable (Service Delivery) was positive and statistically significant ($F=45.851$; $p<0.05$), hence determinants investigated are fundamental and have great effect on service delivery at port of Mombasa. Additionally, it also indicates that the model was statistically significant and can be used to predict the dependent variable.

Table 4.15: Multiple Regressions (Coefficients)

Model		Unstandardized Coefficients			Standardized Coefficients	
		B	Std. Error	Beta	t	Sig.
1	(Constant)	13.512	1.108		12.197	.000
	InfoSystem	.259	.085	.168	3.047	.000
	Infrastructure	.400	.131	.689	3.051	.003
	CService	.361	.107	.135	3.374	.000
	SCompetency	.372	.105	.245	3.543	.027

a Dependent Variable: Service Delivery

Table 4.15 above shows the overall test results findings for the hypostasized study model. The interpretation of the results findings showed follows regression model as indicated below.

$$\mathbf{Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e}$$

Therefore from the regression findings, the research model becomes;

$$\mathbf{Y = 13.512 + 0.259 X_1 + 0.400 X_2 + 0.361 X_3 + 0.372 X_4}$$

Whereby Y = Service Delivery

X_1= Information Systems X_2= Infrastructure Development X_3= Customs Clearance Service X_4= Staff Competency.

The above model shows that holding four investigating determinats (Information Systems, Infrastructure Development, Customs Clearance Service and Staff Competency) at zero constant the performance of service delivery at the port will be 13.512. However, a unit positive change in information system would results to 16.8% increase in service delivery performance at the port (β_1=0.259, Sig=.000) a unit positive change infrastructure development would results to 68.9% increase in service delivery performance at port of Mombasa (β_2=0.400, Sig=.003) a unit positive change Customs Clearance Services would results to 13.5% increase in service delivery performance at port of Mombasa (β_3=.361, Sig.=.000) a unit positive change in staff competency would results to 24.5% increase in service delivery performance at port of Mombasa (β_4=.372, Sig=.027). The study also revealed that infrastructure development at 68.9% was the most important and significant factor that ought to be considered by organization management at Mombasa port in order to enhance service performance, followed by staff competency at 24.5%, information system at 16.8%, and the least was customs clearance service at 13.5%.

4.8 Hypothesis Testing

As indicated in Table 4.15 above, it is evident that the predictor coefficient is statistically significant since their p-values are less than the alpha level 0.05.

Hypothesis one

H_{01} = There is no significant effect of information system on service delivery at the Port of Mombasa.

$B_1 \neq 0$

In relation to the variable, information system, the results in table 4.15 above supported by regression analysis t-value of 3.047 which is greater than the critical value 2.0 and p-value of 0.00 at 95% level of significance which is less than 0.05. After testing the hypothesis, calculated t-value for information system, which is greater than the critical t_{36} (0.05) = 2.0, the study rejected the null hypothesis that information system have no significant influence on service delivery at port of Mombasa. Therefore, the study accepted the alternative hypothesis; information systems have a significant effect on service delivery at port of Mombasa.

Hypothesis Two

H_{02}= The port infrastructure development has no significant effect on service delivery at the Port of Mombasa.

$B_1 \neq 0$

In relation to the variable, infrastructure, the results in Table 4.15 above supported by regression analysis t-value of 3.051,which is greater than the critical value 2.0 and p-value of 0.003 at 95% level of significance, which is less than 0.05.After testing the hypothesis, calculated t-value for infrastructure, which is greater than the critical t_{36} (0.05) = 2.0, the study rejected the null hypothesis that infrastructure development that has no significant influence on service delivery at Mombasa port. Therefore, the study accepted the alternative hypothesis; the port infrastructure has significant effect on service delivery at the Port of Mombasa. This concurs with Daniel & Harback (2016) observations that construction and expansion improves terminals efficiency to provide competitive advantages to lure more ships. In support of this Lakshmanan (2011) explained that investment into transport facilities improves logistics ability and reduces

freight costs. In line with this Onwogu (2018) agrees with study findings that an improvement in port facilities improves customs effectiveness.

Hypothesis Three

H_{03} **:** The custom clearance process has no significant effect on service delivery at the Port of Mombasa.

$B_1 \neq 0$

In relation to the variable, custom clearance, the results in table 4.15 above supported by regression analysis t-value of 3.374, which is greater than the critical value, 2.0 and p-value of 0.00 at 95% level of significance, which is less than 0.05.After testing the hypothesis, calculated t-value for custom clearance, which is greater than the critical t_{36} (0.05) = 2.0, the study rejected the null hypothesis that The custom clearance process has no significant effect on service delivery at the Port of Mombasa..Therefore, the study accepted the alternative hypothesis; the custom clearance process has significant effect on service delivery at the Port of Mombasa. This concurs with UNCTAD (2016) recommendation that automation of the procedures reduces corruption by minimizing direct contact between Customs officers and traders, and significantly reduces the potential negative impact of physical inspections.

Hypothesis Four

H_{04} **:** The staff competence level has no significant effect on service delivery at the Port of Mombasa.

$B_1 \neq 0$

In relation to the variable, staff competence, the results in table 4.15 above supported by regression analysis t-value of 3.543, which is greater than the critical value 2.0 and p-value of 0.027 at 95% level of significance, which is less than 0.05.After testing the

hypothesis, calculated t-value for staff competence, which is greater than the critical t_{36} (0.05) = 2.0, the study rejected the null hypothesis that The staff competence level has no significant effect on service delivery at the Port of Mombasa. Therefore, the study accepted the alternative hypothesis; the staff competence level has significant effect on service delivery at the Port of Mombasa.

4.9 Hypothesis Testing Results

Table 4.16: Hypothesis Testing Results

Hypothesis Statement	β	t	p-value	Decision
H_{01}: There is no significant effect of information system on service delivery at the Port of Mombasa.	0.168	3.047	0.000	Reject the H_{01}
H_{02}: The port infrastructure has no significant effect on service delivery at the Port of Mombasa.	0.689	3.051	0.003	Reject the H_{02}
H_{03}: The custom clearance process has no significant effect on service delivery at the Port of Mombasa.	0.135	3.374	0.000	Reject the H_{03}
H_{04}: The staff competence level has no significant effect on service delivery at the Port of Mombasa.	0.245	3.543	0.027	Reject the H_{04}

The first null hypothesis, H_{01}, stated that there is no significant effect of information system on service delivery at the Port of Mombasa. The results indicated that (β_{01}=0.168; t= 3.047; p < 0.000), hence the H_{01} was rejected leading to the conclusion that information system had a statistically significant influence on service delivery at port of Mombasa. This concurs with Barletta & Bichou (2007) findings that electronic devices enables management at the port to minimize theft cases at the port.

The second null hypothesis, H_{02}, stated that the port infrastructure development has no significant effect on service delivery at the Port of Mombasa. The results indicated that

(β_{02}=0.689; t= 3.051; p < 0.005), hence the H_{02} was rejected leading to the conclusion that infrastructure development had a significant influence on service delivery at port of Mombasa. In support of this Lakshmanan (2011) explained that investment into transport facilities improves logistics ability and reduces freight costs. In line with this Onwogu (2018) agrees with study findings that an improvement in port facilities improves customs effectiveness.

The third null hypothesis, H_{01}, stated that custom clearance process has no significant effect on service delivery at the Port of Mombasa. The results indicated that (β_{03}=0.135; t= 3.374; p < 0.005), hence the H_{03} was rejected leading to the conclusion that custom clearance had a significant effect on service delivery at port of Mombasa.

The fourth null hypothesis, $H_{04,}$ stated that staff competence level has no significant effect on service delivery at the Port of Mombasa. The results indicated that (β_{04}=0.245; t= 3.543; p < 0.005), hence the H_{04} was rejected leading to the conclusion that staff competence had a statistically significant effect on service delivery at port of Mombasa. This concurs with Sum (2016) who ascertained that staff competency can achieved through value added training in business strategies geared towards sustained competitive advantage aligned with corporate objective and goals.

CHAPTER FIVE

SUMMARY OF THE FINDINGS, CONCLUSIONS & RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings, the conclusion and recommendations of the study.

5.2 Summary of the Findings

The study was based on an investigation on determinants of service delivery at the port of Mombasa, Kenya. The study sampled 137 out of which 115 questionnaires were filled and retrieved which translated to 84% response rate. The investigation specifically examined the effect of information system, infrastructure development, customs clearance service, and staff competence on service delivery at the Port of Mombasa. Explanatory research design was adopted. Resource Based View theory, human capital theory and queuing theory formed the theoretical pillars of the study. The study used mean and standard deviations for descriptive statistics analysis. Correlation and regression analyses formed the inferential statistics for the purpose of establishing relationship among variables. The following are the key findings:

5.2.1 Information System

The first objective was determining the effect of information system on service delivery at the port of Mombasa. With overall mean score of 4.27, there was general agreement that information system have a positive and significant effect on service delivery at the port of Mombasa. When information system was correlated with service delivery at the port, there was a strong positive Pearson correlation, r=.741, p=0.000, with regression coefficient of 0.259. This demonstrates that information system plays a significant role in influencing service delivery at the port of Mombasa. This conforms (Samuel, 2012)

observations who noted that information system is one of the most important enablers of effective service delivery. In line with this (Radjou, 2013) explains that use of information system at the port improves port's agility, reduces cycle time, achieves higher efficiency and deliver consignment to customers in a timely manner.

5.2.2 Infrastructure Development

The second objective of the study was determining the effect of infrastructure on service delivery at the Port of Mombasa. With overall mean of 4.54, respondents were in agreement that infrastructural development has a great influence on service delivery at port of Mombasa. This is supported by a strong positive Pearson correlation (r=.777, p=0.003) with regression coefficient of 0.400, between infrastructure development and service delivery, which implies that infrastructure development greatly affects service delivery at the port of Mombasa. In support of this Lakshmanan (2011) explained that investment into transport facilities improves logistics ability and reduces freight costs. In agreement with this Wilmsmeier & Hoffmann (2008) adds that investment in quality infrastructures at the port helps to reduce freight rates for importing and exporting countries as in the case of Caribbean port. In line with this finding Sánchez *et al*. (2003) found that freight costs are lower in a port with efficient infrastructures. On the other hand, inefficient ports as explained by (Clark *et al*., 2004) are bound to reduce national and international trade which can affect economic growth adversely due to poor service delivery.

5.2.3 Customs Clearance Service

On the third objective, the relationship between custom clearance process and service delivery at the Port of Mombasa. The study looked at mapping and directions at the port, storage and waiting charges and clearing and forwarding agents, and respondents

were in agreement with a mean score of 4.47. When project customs clearance service was correlated with service delivery; there was a strong positive Pearson correlation (*r*=.743, p=0.000) with regression coefficient of 0.361. This indicates that customs clearance service affects to great extent provision of service delivery at the port of Mombasa. This result conformed to the finding of an earlier study which showed that improvement in port facilities improves customs effectiveness, if there is no corruption and bribery to cause a diversion of effort from clearance functions to unproductive services of negotiating bribe payments (Onwogu, 2018).

5.2.4 Staff Competency

The fourth objective was to determine the influence of staff competence level on service delivery at the Port of Mombasa. The study looked at education of staff, consultation by logistical key players and mode of selecting workers. With overall mean score of 4.35, respondents were in agreement that staff competency has significant effect on provision service delivery port of Mombasa. The findings also revealed a significant and moderately strong positive Pearson correlation (*r*=.551, p= 0.027) with regression coefficient of 0.234, between staff competency and service delivery. This implies that staff competency plays a significant role in provision of service delivery at the port of Mombasa. The findings of the study tailed with that of Okeudo (2017) who found that staff competency have a significant and a positive impact on the firm's performance. This finding also concurs with that of (Sharma, 2009) who explained that human capital investment to retain the core competences when employees are highly developed with the help of training in their work.

5.3 Conclusions

5.3.1 Information System

From the study findings above, the study concludes that there is a positive link between information system and service delivery that positively affects service delivery at the port of Mombasa. The study also concludes that information systems that are used by custom bonded warehouses to gather, sort, analyze, evaluate and distribute needed, timely and accurate information to decision makers have been found to improve service delivery and performance at the port. The study further concludes that integration of information system in port has had great effect in unlocking the efficacy of the port by improving information sharing, increasing predictability, and reducing waste in value chain.

5.3.2 Infrastructure Development

The study established that infrastructure development is essential in service delivery at the port of Mombasa. The construction and expansion of terminals has potential to improve efficiency at the port. The study concludes that there is a positive link between infrastructure development and service delivery which suggests that infrastructure development plays a significant role in service delivery at the port of Mombasa. In support of this Lakshmanan (2011) explained that investment into transport facilities improves logistics and reduces freight costs. In line with this Onwogu (2018) agrees with study findings that an improvement in port facilities improves customs effectiveness.

5.3.3 Customs Clearance Service

The study found that customs clearance services have a significant effect on service delivery at the port of Mombasa. This concurs with study findings by (UNCTAD, 2017)

who ascertained that customs clearance as one of the key indicators of port performance. Customs clearance procedures are common in Maritime organizations such as KPA. They are specialized procedures and processes designed to maintain uniformity and controls in cargo clearing process in custom bonded warehouses. Thus, study concluded that corruption causes a diversion of effort from clearance functions to unproductive services of negotiating bribe payments. This concurs with UNCTAD (2016) recommendation that automation of the procedures reduces corruption by minimizing direct contact between Customs officers and traders, and significantly reduces the potential negative impact of physical inspections.

5.3.4 Staff Competency

On staff competency the study concludes that it has an impact and of great relevance on service delivery at port of Mombasa. The study found that increase in human capital investment enhances staff competency and improves their performance. This concurs with Nyabwanga, (2013) who argued that the employee's performance can be more effective if he/she was trained. This also concurs with Sum (2016) who ascertained that staff competency can achieved through value added training in business strategies geared towards sustained competitive advantage aligned with corporate objective and goals.

5.4 Recommendations

Based on the findings and the subsequent analysis from the study, it was established that information system, infrastructure development, customs clearance service and staff competency have great effect on service delivery at port of Mombasa. Based on study findings, the following recommendations on service delivery are imperative:

The study found that bureaucratic procedures that have been identified at the port of Mombasa has been the cause of slow clearance processes and encourages corruption. Due to this the study recommends automation of the procedures to minimize direct contact between Customs officers and traders.

The study established that qualities of infrastructures are important in enhancing trade facilitation at the port of entry and exist. The study recommends that government injects in more fund to expand port facilities in terms infrastructure development to attract more traders.

The study established that port performance highly depends on competency of its staff. The study recommends that in future the organization to invest more in training of its staff in order to cope with ever changing business environment.

Due to limited land for port expansion the port, should embrace advanced technology to improve the capacity of its limited physical resources to run a large Port as for the case of Singapore.

5.5 Suggestions for Further Study

This study focused on determinants service delivery at the port of Mombasa. From the analysis, study variables explained only 62.5%. Since only 62.5% was explained by the independent variables in this study; it is important that other studies be carried out to focus on other aspects of capital resources to fund projects, corruption and training and how they influence service delivery at the port of Mombasa. Future studies should also be conducted in other small ports, to facilitate generalisation of the study findings.

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APPENDICES

Appendix I: Letter of Introduction

EDWARD KIPKOSGEY TAALAM

P.O BOX 48240-80100
MOMBASA

Dear Respondent

REF: RESEARCH STUDY

I am a student pursuing Masters in logistic and procurement at Moi Campus majoring in logistics and procurement. It's a requirement that I should undertake this research project in fulfillment for the award of Masters.

I am kindly requesting you to spare me some time and fill in this questionnaire. All information given will be treated with utmost good faith and for study purpose only. At no time will your name feature anywhere in my report.
Thank you in advance as I look forward for your cooperation.

Yours Faithfully,

Edward Kipkosgey Talam

Appendix II: Questionnaire

Performance of Marine Operations

This study is purely academic and respondents are assured that whatever information is provided will be highly confidential.

Instructions: Please kindly tick the box that clearly expresses your view about a question.

SECTION A

1. Gender of respondent

   Male [ ] Female [ ]

2. Age bracket of respondent

   [ ] 20-29 years

   [ ] 30-39 years

   [ ] 40-49 years

   [ ] 50-59 years

   [ ] >60 years

3. Period of service at the firm by the respondent

   [ ] < 1 yr

   [ ] 1-5 yrs

   [ ] 6-10 yrs

   [ ] >10 yrs

4. Period of existence of the firm at the port

   [ ] 1-5 yrs [ ] 6-10 yrs [ ] 11-15 yrs [ ] >16 yrs

SECTION B: INFORMATION SYSTEM

Please indicate the extent to which you agree or disagree with regards to information system:

Opinion Statements	**Strongly Disagree (1)**	**Disagree (2)**	**Not Sure (3)**	**Agree (4)**	**Strongly Agree (5)**
There is simulation of port terminal operations					
There is existence of electronic devices on the containers					
There is computerized terminal control systems in place					
There is presence of data reliability and improvement					
There is information exchange amongst the firms at the port					
The information system used at the port for operations is user friendly					
There is training done for improvement of information exchange amongst the key players in logistical operations					

SECTION B: INFRASTRUCTURAL DEVELOPMENT

Please indicate the extent to which you agree or disagree with regards Infrastructural Development

Opinion Statements	**Strongly Disagree (1)**	**Disagree (2)**	**Not Sure (3)**	**Agree (4)**	**Strongly Agree (5)**
There is dredging framework at the port					
The is rail and road network is well established					
There is existence of port land expansion					
There has been terminal construction and expansion					
There is aspect of incorporating newer port facilities					
Infrastructural development has led to increase in container throughput at the port					

SECTION C: CUSTOM CLEARANCE PROCESS

To what extent do you agree or disagree with the following statement related to custom clearance process

Opinion Statements	**Strongly Disagree (1)**	**Disagree (2)**	**Not Sure (3)**	**Agree (4)**	**Strongly Agree (5)**
There are sufficient check point facilities at the port					
There are enough clearing and forwarding agents at the port					
The storage and waiting charges are fair to users.					
There is good mapping and directions at the port					
The custom clearance process is easier to comprehend to the logistical key players at the port					

SECTION D: STAFF COMPETENCE LEVEL

Staff competence level impacts on the performance of logistical firms, kindly indicate whether you agree or disagree with the following statement.

Opinion Statements	**Strongly Disagree (1)**	**Disagree (2)**	**Not Sure (3)**	**Agree (4)**	**Strongly Agree (5)**
There is sufficient training of staff					
There is appropriate mode of selecting workers					
The level of education determines the competency level of staff					
International standard qualification and standards are adhered in course of selecting and training staff					
There is sufficient consultation by the logistical key players for minimum requirements for qualification of members at the port					

SECTION E: SERVICE DELIVERY

Opinion Statements	**Strongly Disagree (1)**	**Disagree (2)**	**Not Sure (3)**	**Agree (4)**	**Strongly Agree (5)**
The current dwell time at the port is satisfactory					
Cargo delivery efficiency is having a negative effect on the cost of doing business at the port of Mombasa					
The current cargo delivery time at the port of Mombasa is satisfactory					
The port operating hours convenient to all their customers.					
The port respond to customers' requests and complaints promptly					
It is possible to have a lower dwell time than the current dwell time at the port					