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Factors Affecting Containerized Cargo Clearance at Kenya Port Authority

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Abstract:
Delay of containers on container clearance has emerged and evident at the port of Mombasa which has indicated long clearance period or overstay of received containers at the port for more than 10- 12 days. The delay in clearing containers at the port is made worse by infrastructural decay and lack of suitable ship and cargo handling equipment, lack of space capacity for the ships to dock waiting loading and long custom clearance procedures and requirements. The objective of the study was to assess the factors affecting containerized cargo clearance in the Kenyaport with focus on specific objectives, to establish the effects of documentation process on container clearance at KPA, to determine the effects of handling equipment on containerized cargo clearance at KPA, to find out the effects of transport infrastructure on containerized cargo clearance at KPA and to assess the effects of space capacity on containerized cargo clearance at KPA. This study adopted a descriptive research with survey of a total population of 200 and applied a stratified random sampling technique to select a sample size of 50 respondents. The study used questionnaires, interviews, observation techniques and reviews, in order to bring out the results of the study as expected. Respondents were drawn from the departments within Kenya Port Authority. The study analyzed the data using Statistical Package for Social Sciences (SPSS). The findings of the study were presented using tables and discussions.

1. Introduction

1.1. Background of the Study

Containerized cargo clearance is the time taken in processing the received containers, unloading, warehousing, verification, internal movement of containers and issuing of containers to clearing and forwarding firms, owner or transshipping in case of containers on transit. Container clearance is the process by which: the processing time of documents, offloading, verification, warehousing and issuing of cargo is not done according to stipulated time. Cargo delays stems either from ill adapted infrastructure; insufficient level of traffic within the physical and environmental constraints or due to lack of technical capability contributes to cargoes delay on containers clearance in several ports in the world."Administrative procedures or handling problems are other causes of delays on container clearance in port terminals of the world" (Cuadrado et al. 2010).

According to Antwerp, (2011), the overall level of delay on containers clearance is not alarming as in the United States, Asian and Russian ports. The optimal utilization of the port terminal is difficult to deal with situations where port is full to capacity at the peak period. The UK ports of Felixstowe and Southampton have already had serious Container clearance with ship operators opting to unload cargo at Rotterdam or Antwerp and then feed the freight back to the UK by shipping on smaller vessels through alternative ports. At port level the cargo delays adversely affects all operators namely the carriers, terminal operators and road haulers'.

Considering port terminals are the main nodal for EU imports and exports, the effects of delays on container clearance spread throughout the entire supply chain. Port delays will seriously affect the quality of the citizens living in the port areas, along with jeopardizing the efficiency of the service. In decongesting the port terminal, in Rotterdam, ship operators, barges companies and other stakeholders set upwith the objective of mitigating the problems involved in the movement of containers or cargo from the port to the owner of the container. In the ports of Felixtowe and Southampton, freight forwarders have established an intermodal rail service that move cargo as quickly as possible off the dock to stacking yard inland thus the company reducing the number of containers in the terminal.

Proximity to the European economic core affects terminal performance. Northern European ports within the range of Le Havre and Hamburg serve important and growing hinterlands. They have efficiently capitalized on economies of scale and compete in southern European hinterland ports (for example, Italy, France). Some Mediterranean ports have emerged as intermediary transshipment hubs that connect other continents with northern European ports (Notteboom, 2010).

Proximity to the Mediterranean Sea influences performance because the Mediterranean Sea marks the Asia–Europe shipping crossing point. Mediterranean ports concentrate container flows from the hinterland and from feeder ports. They also serve northern European ports, including Atlantic ports, and ports in North America, South America and Africa. Notteboom (2011)claimed that the proximity to major shipping networks is important when selecting a terminal. The main hubs tend to have common characteristics, such as

excellent nautical accessibility, as well as proximity to important hinterlands, main navigation routes and crossing points of North–South and East–West routes (Notteboom and Rodrigue, 2009, 2011).

The port of Rotterdam's and Durban container terminal operations serves as a benchmark to the port of Dubai and other ports in Africa countries. The governments of Hong Kong and Singapore ports have invested much more in resources to ensure efficiently container clearance is done to earn a lots of revenue for the countries. Gantry cranes are key elements of superstructure in port container clearance as they are placed in the ship berth interface.

The Port of Singapore refers to the collective facilities and terminals that conduct maritime trade handling functions in harbors and which handle Singapore's shipping. Currently the world's second-busiest port in terms of total shipping tonnage, it also trans-ships a fifth of the world's shipping containers, half of the world's annual supply of crude oil, and is the world's busiest transshipment port. It was also the busiest port in terms of total cargo tonnage handled until 2005, when it was surpassed by the Port of Shanghai. Thousands of ships drop anchor in the harbor, connecting the port to over 600 other ports in 123 countries and spread over six continents.

High growth in containerized traffic has seen the port overtaking Hong Kong since the first quarter of 2005, and has led the race ever since, with an estimated 19,335 TEUs handled in the year up to October, compared to 18,640 TEUs handled in Hong Kong in the same period. A rise in regional traffic consolidating the port's position in Southeast Asia, and increases in transshipment traffic using the strategic East Asia-Europe route via Singapore helped the port to emerge tops at the end of the year, a title it had not held since overtaking Hong Kong once in 1998.Singapore port played vital role in emerging economy.

Hong Kong is one of several hub ports serving the South-East and East Asia region, and is an economic gateway to mainland China. Hong Kong set a record in its container throughput in 2007 by handling 23.9 million TEUs (20-foot equivalent units of containers), maintaining its status as the largest container port serving southern China and one of the busiest ports in the world. Some 456,000 vessels arrived in and departed from Hong Kong during the year, carrying 243 million tonnes of cargo and about 25 million passengers.[1] The average turnaround time for container vessels in Hong Kong is about 10 hours. For conventional vessels working in mid-stream at buoys or anchorages, it is 42 and 52 hours respectively.

The port Los Angeles container volume is 7.9 million twenty-foot equivalent units (TEU) in calendar year 2013. The port is the busiest port in the United States by container volume, the 16th-busiest container port in the world, and the 9th-busiest worldwide when combined with the neighboring Port of Long Beach. The port is also the number-one freight gateway in the United States when ranked by the value of shipments passing through it. For the second consecutive year, the Port of Los Angeles experienced record-breaking exports as outbound container volumes surged in 2010 and 2011.

The Chinese port of Shanghai, with a throughput of 35.29 million teu, took the crown in 2014 as the world's busiest container port for the fifth year in succession. Last year's box volumes were 4.5% higher than the 33.77 million teu recorded in 2013. Shanghai overtook Singapore in terms of container throughput in 2010. The Lion State has yet to release its full year figures for 2014. In comparison, Australia's box trade has been increasing month-by-month. Container trade in Australasia and Oceania in 2014 grew from the previous year by an average of 1617 teu per month, according to data from Container Trade Statistics (CTS).

The Port of Shenzhen is one of the busiest and fastest growing ports in southern mainland China and the fourth busiest in the world behind Shanghai, Singapore and Hong Kong. As a container hub port and Special Economic Zone (SEZ), it is one of the most important ports in South China's international trade. Yantian International Container Terminals, Chiwan Container Terminals, Shekou Container Terminals, China Merchants Port and Shenzhen Haixing are the major port terminals in Shenzhen. However, Shenzhen's long term plan includes the construction of six new ports in order to integrate with the Port of Hong Kong.

The port of Durban handles the greatest volume of sea-going traffic of any port in southern Africa. For the 2008/09 financial year ended 31 March 2009, the Port of Durban handled a total of 4,554 sea-going ships with a gross tonnage of 114,723,266 or about 38 percent of the ships calling at all South African ports. Cargo handled during the fiscal year 2011/12 amounted to78, 100,851tonnes, which included oil and petroleum products and containers.

Total tonnage handled by the port (including a calculation for containers) constituted 45,282,995t of imports, 25,613,589t of exports and 7,204,267t of transshipment cargo giving a total tonnage for the port of 78,100,851 tonnes. The combined Durban container terminals handled 2,698,173 TEUs (twenty foot equivalents) during 2011/12 of which imports were 1,121,216 exports were 1,077,265 and 499,692 TEU were transshipped. Included in the above were 32,130 TEUs that were shipped coastwise. Containers handled at Durban represented 62 percent of the total number of containers handled at South African ports.

Durban has two floating cranes. Indlovu has a lifting capacity of 235 tonnes at 10m and 125t from 24m. The smaller Imvubu is privately owned by Elgin Brown & Hamer and has a lifting capacity of 60 tonnes at 6.1m or 40.6t at 16.2m from the outboard edge. The port employs a number of launches and cargo punts including a 100-passenger harbor boat named Isiponono, which is used for trade and business tours of the port. A pollution boat named Udonti also serves the port. Several private companies provide commercial diving services and the port also maintains a fully equipped diving team.

Dar es Salaam port is the Tanzania principal port with a rated capacity of 4.1 million (dwt) dry cargo and 6.0 million (dwt) bulk liquid cargo. The Port has a total quay length of about 2,000 metres with eleven deep-water berths. Dar es Salaam port handles about 95% of the Tanzania international trade. The port serves the landlocked countries of Malawi, Zambia, Democratic Republic of Congo, Burundi, Rwanda and Uganda. The port is strategically placed to serve as a convenient freight linkage not only to and from East and Central Africa countries but also to middle and Far East, Europe, Australia and America.

Cape town port is one of the world's busiest trade routes it is one of the busiest ports in South Africa, handling the largest amount of fresh fruit and second only to Durban as a container port. The port also has significant repair and maintenance facilities that are used by several large fishing fleets and parts of the African oil industry. Because of the many tourist attractions offered by Cape Town and its surrounding region, many cruise ships also berth in the port.

The port is open 24 hours a day, 7 days a week. All vessels berthing in the port require a pilot on board. Transfer is by pilot boat but plans have been made to introduce a helicopter transfer service. Severaltugs, launches, workboats and other specialized vessels are operated by the port. During the 2005/06 financial year, the Port of Cape Town handled 3,400 vessels for a gross tonnage of 48,778,963-gt. Total cargo handled at the port (excluding containers) was 3,718,005 tonnes; container tonnage is estimated at 9.948 million tonnes. In 2010, the port handled 719,825 TEU.

Kenya has the best port which is the busiest in East Africa and serves for both East Africa and East and Central Africa having a capacity of fifteen container ships entering the port of Mombasa. The President of the republic of Kenya Mr.Uhuru Kenyatta with his government has put strategies and mechanisms in place to ensure that KPA remains the main source of revenue for the country of Kenya. The KPA stakeholders have ensured that it remains the top port in East Africa through efficient and effective in providing the best customer services to the customers.

Kenya ports Authority handbook (2010-2011), until 2007 the port of Mombasa had problems to stack or handle too many inbound containers and not enough space to stack or handle them. The long standing issue had pushed up costs for importers and caused serious problems to the port Authority. Kenya shippers council, issue paper no.3,(2011),the CFS model has been used in many ports worldwide to address the problem of port delays and congestion, India, South Africa and Nigeria are some of the countries that have this model. The model provides for all imported cargo to be transferred directly to privately operated inland container depots known as container freight stations (CFS)after discharge from vessel. In Kenya, the first set of CFS were established in 2000 within the port area, mainly to handle de-stuffing of less container load (LCL)cargo with the hope of reducing congestion at the port of Mombasa. With increasing demand for space due to increase in the container handling at the port of Mombasa, the research or study will establish whether there is need to increase capacity of the port through use of existing private sector capacity.

The World Bank, in its annual Doing Business 2012 reports, which ranks economies based on the ease of doing business, rated Kenya low at 133 among 183 economies in the world that were assessed. One of the areas, which the World Bank beamed its searchlight on was the ease of operations at the ports, noting that the excessive document requirements, burdensome customs procedures, inefficient port operations and inadequate infrastructure, led to extra costs and delays for exporters and importers doing business in Kenya (jean, 2011*)*.

Kenya's landlocked neighbors' had to factor additional costs into their budgets and put up with a heavily congested Mombasa Port, run by the Kenya Ports Authority (KPA) and frequent breakdowns of the Simba system of container clearance run by the Kenya Revenue Authority. Various players operating at Mombasa's port are trading accusations over the congestion that has delayed container clearance, exerting pressure on commodity prices *(*stakeholders meeting,2012*)*.The delay has resulted in "artificial" shortages, causing prices of various products in the market to sky rocket, including liquefied petroleum gas. Some shipping lines issued notices to stop accepting any new bookings destined for Mombasa until the crisis at the port eases due to lack of berths/space for the ships to dock (Adebayo, 2012*)*. This untenable and costly situation has disrupted businesses as they have no access to supplies over the last 4 months due to systems failure, infrastructure, cumbersome procedures by port operators and lack of space capacity. This has made it extremely difficult to move containers out of the Port to the Container Freight Stations.

The demurrage charges were having a significant net impact on the country economy during the congestion of the containers at the Kenya port where a clearing of container would take 10 days. Ugandan traders decided to revive the Uganda National Trade and Facilitation Forum and form a shippers' council to lobby for the reduction of prohibitive transportation costs emanating from the Northern Corridor. This came about as a ripple effect; delays at Mombasa Port increased their costs and these were passed on to the final customer, resulting in lower sales and profits (KTA, 2011).The Delays on clearing the containers at the port were giving the port a bad name and it is something that can be fixed. This means that every second of delay quickly translates to a loss big enough to be felt across the Great Lakes region. Experts had pointed out that Mombasa port can only be efficient once there is a good network of roads and efficient railway transport that match the influx of imports and exports (Onyango et al, 2010).

1.2. Statement of the Problem

Containerized cargo clearance was evident at the port of Mombasa which was indicated by long clearance period or overstay of received containers at the port for more than 10 -12 days. Ugandan traders decided to revive their Uganda National Trade and Facilitation Forum and form a shippers' council to lobby for the reduction of prohibitive transportation costs emanating from the Northern Corridor which came about as a ripple effect of delays in clearing the containers. The World Bank, in its annual business reports 2012, that ranks economies based on the ease of doing business, rated Kenya low at 133 among 183 economies in the world due to congestion of containers at the port waiting clearance. (Jean, 2012*)*.

Containerized cargo clearance throughput flowing the supply chain logistical corridors and handled by the ports has increased overtimes, as is evidenced by doubled ship capacity over the past decades from 1st generation containers to 4th generation and massive investment in capacity and facility upgrade by ports. This phenomenon has stretched the hinterland transport infrastructure leading to congested container flow through the corridors and challenges which arise as a result of not planning ahead.

The delay in clearing containers at the port was made worse by infrastructural decay and lack of suitable ship and cargo handling equipment, lack of space/berths for the ships to dock waiting loading among others. The attendant frustration was largely responsible for the situation where some importers and ship owners diverted ships destined to Kenya to neighboring port of dar-es-salaam, Tanzania. The delays on clearing the containers at the port were costing importers huge storage charges with containers taking up to 14 days to move from the port to container freight stations (CFSs) where most of the domestic cargo was cleared. Kenya's landlocked neighbors' had to factor additional costs into their budgets to put up with a heavily congested Mombasa Port that was run by (KPA) and the frequent breakdowns of the simba system run by (KRA) responsible for containers clearance (Wanjohi, 2012*)*. The result of

this being colossal loss of revenue by government through its agencies such as the Kenya Ports Authority, KPA, and the Kenya Customs Service, Other private sector operators in the chain, especially importers, manufacturers, and transporters also incurred heavy losses, due to delays in container clearance which they eventually passed on to consumers.

The containerized cargoclearance has resulted in artificial shortages, causing prices of various products in the market to rise. This untenable and costly situation has disrupted businesses as they had no access to supplies over the last 4 months due to systems failure, infrastructure, space and cumbersome procedures by port operators. In Kenya, several companies had to shut down factory operations for lack of raw materials .Other private sector operators in the chain, especially importers, manufacturers, and transporters also incur heavy losses, due to delays in container clearance which they eventually passed on to consumers. Hence the study will find out appropriate factors affecting cargo delays on containers clearance at the port terminals.

1.3. Objectives of the Study

1.3.1. General Objective

The general objective was to assess the factors affecting Containerized cargo clearance in Kenya Ports Authority.

1.3.2. Specific Objectives of the Study

The following specific objectives guided this study;

i. To establish the effects of documentation process on containerized cargo clearance at Kenya Ports authority.
ii. To determine the effects of handling equipment on containerized cargo clearance at Kenya Ports Authority.
iii. To find out the effects of transport infrastructure on containerized cargo clearance at Kenya Ports Authority.
iv. To assess the effects of space capacity on containerized cargoclearanceat Kenya Port Authority.

1.4 Hypothesis.

- Hypothesis 1
  - → $H0_1$: Documentation process has no significant effect on containerized cargo clearance at Kenya Ports Authority.
  - → HA_1: Documentation process has a significant effect on containerized cargo clearance at Kenya Ports Authority.
- Hypothesis 2
  - → $H0_2$: Handling equipment has no significant effect on containerized cargo clearance at Kenya Ports Authority.
  - → HA_2: Handling equipment has a significant effect on containerized cargo clearance at Kenya Ports Authority.
- Hypothesis 3
  - → $H0_3$: Transport infrastructure has no significant effect on containerized cargo clearance at Kenya Ports Authority.
  - → HO_3: Transport infrastructure has a significant effect on containerized cargo clearance at Kenya Ports Authority
- Hypothesis 4
  - → $H0_4$: Space capacity has no significant effect on containerized cargo clearance at Kenya Ports Authority.
  - → HA_4: Space capacity has a significant effect on containerized cargo clearance at Kenya Ports Authority.

1.5. Justification of Study

The findings of the study gave an insight into the current problem to improve on containerized cargo clearance at the port terminals. Containerized cargo clearance stakeholders at the port terminals were expected to assist port authority to come up with policy in their respective entities to overcome the problem. The policy helped to improve on the efficiency and effectiveness of the deliveries made thus reduced time to transport cargo from one point to another. KPA also benefited from the study in that they were able to adopt and implement proper ways of reducing Containers clearance and increase efficiency in container clearance so that they can attract more stakeholders hence generating revenues and finally the stakeholders benefited by not having to incur extra storage costs on their containers that take long before they are cleared.

1.6. Scope of the Study

The study focused on factors affecting Containerized cargo clearance at the Kenya port Authority which was the study area. The study was undertaken in Mombasa in the container terminal area where container clearance is done. The study covered mainly the container terminal workers, clearing and forwarding departments and the engineering departments.

2. Literature Review

2.1. Introduction

This chapter gives a review of the existing literature on the factors affecting Containerized cargo clearance in port terminals. The review is meant to exemplify the key concepts of the topic of discussion. It provides the basis of critical review and a clear understanding of the problem. The main sections included therein are; the conceptual framework, critique of existing literature relevant to the study, summary and research gaps.

2.2. Theoretical Review

Containerization and intermodality have undergone rapid growth in recent decades. This growth owes to hinterland expansion and transshipment operations at intermediate ports and the crossing points of trade lanes. Container traffic growth has led to high demand for container terminals, resulting in port congestions, a need for investment in new terminals and greater competition between terminals within and between ports. Container terminals are competing to become transshipment hubs as part of major shipping lines and feeder networks, while greater inland transport accessibility has allowed ports to spread further inland.

2.2.1. The Concept of Queuing Theory

Adedayo et al. (2009) stressed that many situation in life requires one to line up or queue before being attended to. This lines formed are referred to as waiting lines or queues. According to them queue occurs when the capacity of service provided fall short of the demand for the service. Sanish (2011) in his article on application of queuing to the traffic at New Mangalore Port refers to queuing theory as an analytical techniques accepted as valuable tool for solving congestion problems. According to him the primary inputs to the models are the arrival and service patterns. These patterns are generally described by suitable random distribution. He observed that the arrival rate of ships follows exponential distribution while the service time follows Erlang or Poisson distribution. He observed that queuing theory can be used to predict someimportant parameters like average waiting time of ships, average queuing length, average number of ships in the port and average berth utilization factor closer to the actual values.

Queues are not an unfamiliar phenomenon and to define it requires specification of the characteristics which describes the system such as the arrival pattern, the service pattern, the queue discipline and the queue capacity Adedayo et al. (2013) observed that there are many queuing models that can be formulated. According to them it is essential that the appropriate queuing model is used to analyze problems under study. The arrival pattern: This may be the arrival of an entity at a service point. This process involves a degree of uncertainty concerning the exact arrival times and the number of entities arriving. And to describe this process there are some important attributes such as the sources of the arrivals, the size of each arrivals, the grouping of such an arrival and the inter-arrival times. The service pattern**:** This may be any kind of service operation which processes the arriving entities. The major features which must be specified are the number of servers and the duration of the service. The queue discipline: This defines the rules of how the arrivals behave before service occurs.

A contributor to container terminal congestion is the time containers dwell in the storage yard after being delivered to the terminal or unloaded from the ship. Prolonged container dwell time results in high storage yard area occupancy and may create substantial adverse effects on terminal productivity and throughput capacity. With improved management of container flows, additional terminal capacity may be created without investing in costly new equipment and yard capacity improvements, Holgan et al (2010). Containers arriving at the port terminals are temporary stored in the terminals yard before being loaded to their next mode of transport. The time period containers stay in the yard is influenced by some factors depending on long term contractual agreements (Merck, 2009).

2.2.2. Modern theory

The researcher used the modern theory which focused on the single electronic window system. Under the single window system, systems interact with other systems or the outside environment in order to curb the problems and difficulties in container clearance. some of the features of the single electronic window system include: receiving data from other sources, input data converted into output data and the owner of the cargoes does not need to use the clearing and forwarding agents to clear the goods but ought to clear all the payments online then the cargoes are delivered to the owner. The single electronic window system has help in ensuring fast and reliable information to the owner of the cargoes, government being in the position to get the taxes and revenues through the system thus increasing efficiency and effectiveness of all the activities carried out during the clearance of containers. As a growing and leading port in east and central Africa Kenya port authority must continue embracing the use of modern technology systems in streamlining their efficiency and supply chain in order to add value and be ahead of its competitors. The researcher analyzed the variables and seeing how they are interacted in order to improve and eradicate the cargoes delays in the port of Mombasa.(Rowland, 2014).

2.2.3. Markov Theory

According to Notteboom (2009), Markov theory overcomes the independency problem in system modeling due to its ability to represent the dependencies among the different parts. It is used in systems that evolve discretely or continuously in proportion to space and time. Usually they estimate availability or reliability in discrete space and continuous time. Therefore the system has a finite number of states but the transitions among them may occur at any instant of time. Markov theory illustrates the possible situations that a system goes through and the transitions among them.

The situations are mutually exclusive, while the transitions describe a situation change between a normal state and a repair.

The existence of the memory less property of a Markov system is necessary in order to use Markov modeling. This means that future states are independent of past states.

Among many applications, Garcia et al (2011) used Markov models to quantify failure modes whereas Fleming (2011) used the model for reliability purposes.

2.3. Conceptual Framework

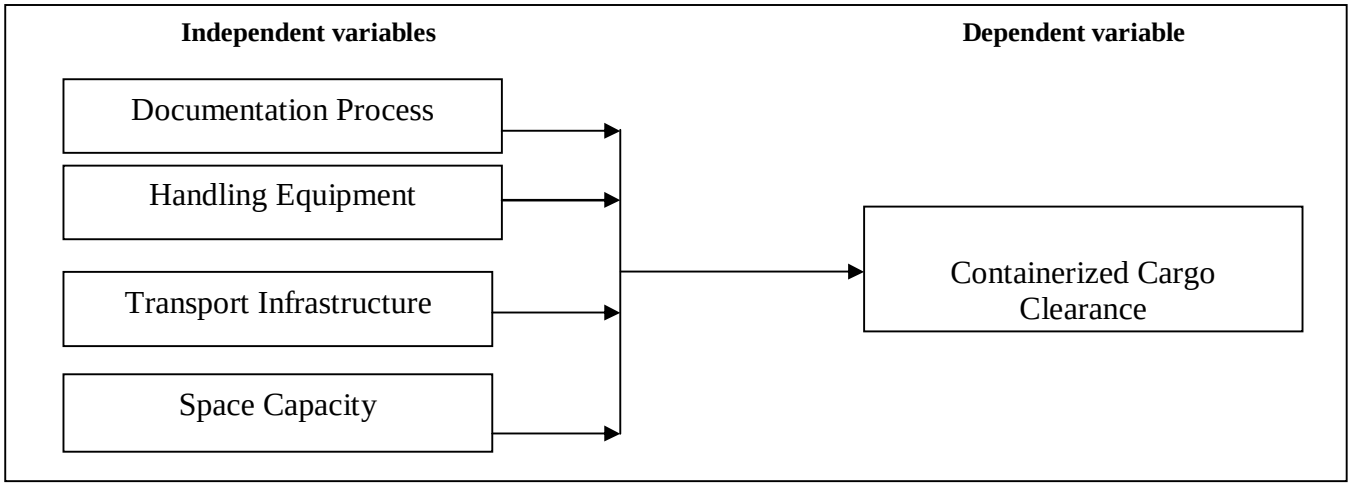

Figure 1: Conceptual Framework

The above diagram gives an illustration of how the variables cause delays on container clearance. Documentation process, handling equipment, transport infrastructure and space capacity are the resultant causes of delays on containerized cargo clearance at the port of Mombasa.

2.3.1. Documentation Process

Documentation process involves the various forms used at the sea-port as well as the Kenya revenue authority forms for clearing imports and exports of goods. These documents are in various forms and pass through various departments or units/section at the port and are used for the operation of undertaking clearance of cargo. Examples are invoices, import declaration forms, Bill of lading, customs declaration forms, consignment notes, packing list and certificate of origin. (Branch, 2013)

According to (Lambert et al, 2012*)* one of the most important facets of international logistics is the paperwork that must be completed before, during, and after the shipment of a product to a foreign market, while documentation is not a glamorous of global logistics, it is a necessary part. International documentation is much more complex and consumes a lot of time than domestic documentation because each country or world region has its own specifications and requirements resulting to delays on loads to be cleared on time. Absolute accuracy is required; errors may result in delayed shipments or monetary penalties.

Despite some progress since 2007,the clearing process at Mombasa port, the container freight stations(CFS) and customs procedures remain the main sources of delay and high logistics in East Africa region, whether it is for local containers or for transit containers (for which the procedures are more complex and the delays worse).Stakeholders observe that many of the operational bottlenecks that translate to delays at the port are the result of actions by customs(KRA),but others are due to actions (or lack of actions)by other stakeholders such as shipping lines,C&F agents and other government agencies (Agutu et al,2012*)*.

From the *(*stakeholders meeting, 2012*)*,some of the cumbersome procedures include some 8 documents and 29 steps for the process of clearing goods intended for local market and 27 steps for goods intended for transit ranging from the ports to customs. The recently introduced electronic communication systems and long established manual systems are still posing a real challenge resulting in incessant delays at the port. Revenue Authorities in most of the African countries view importers and their agents with suspicion, as greedy people who use unethical practices to deny the government the required revenues for development. They are viewed as people who will make false declarations, cut corners in-order to bypass the established systems. In order to reduce the risks, customs officials are often rigid in the manner in which customs procedures and other processes and regulations are administered, often without discretion, which can be a major hindrance to the smooth flow of cargo through the port.

The reports indicated that Kenya Ports Authority bears heavy blame for congestion at the Port of Mombasa causing losses to the national economy through delays in clearance of containers. It further said that Ms Fatima Yusuf, the KRA spokesperson in the Coast region said that delays are caused by the other authorities such as Kenya Bureau of Standards who are expected to participate in handling of some cargo (Wanjohi,2012). *(*KTN ,2011*)* reported about the Rwanda president Paul kagame's visit to the port of Mombasa, where the president stated that if KPA improved on documentation and reduced the number of delays in transportation of cargo to Rwanda, KPA would have handled all the exports and imports for that country. The efficiency at Mombasa fares badly when compared with Durban and even Lagos.

(Stakeholder analysis, 2012) clearance at the port of Mombasa involves a complex mix of government processes, logistics and transport infrastructure. There exists an uncoordinated approach by the various trade facilitation state agencies in executing their mandates. Usually; they are not available to conduct joint verifications resulting in containers being stripped severally for verification resulting into delays. A public outcry against congestion at Mombasa Port should make the Kenyan government to initiate some measures to speed up cargo clearance and prevent accumulation of charges necessitated by delays from being passed on to importers and consumers.

2.3.2. Handling Equipment

Handling systems means the mechanism used in moving materials from one point to another with less human effort (Lyons, 2009). Material handling equipment and systems often represents major capital outlays for organization. Like the decisions related to the number, size, and location of warehouses, materials handling decisions can affect many aspects of logistics operations (Lambert et al, 2001).

(Stakeholders report, 2012) states that it is unfortunate that quite a number of significant interventions that would have eased the delays at the port have been known for over 30 years. All the major stakeholders agree with the assertion that "Mombasa port facilities are inadequate and in poor condition" and that without substantial investment in equipment, the port is unlikely to handle more traffic. Moreover the existing terminal which is designed to handle a throughput of 250,000TEUs per annum through three berths now handles a total of 695,000TEUs in 2010; this growth in container traffic has put a strain on the existing facilities and compounded the congestion problem.

According to (Bailey et al, 2004), one of the most basic requirements of any organization is to be able to transport or move materials, equipment's and spare parts from one point to another. Material handling is of vital importance and is indicated by the range and high cost of the equipment that each organization have. Handling materials, which is a major activity in storehouse and stockyard is a costly operation and therefore the methods and equipments should be efficient. Poor handling equipment's leads to Shorty work making an organization not to handle the required load on time, causing delays, congestions and inefficiencies along the supply chains.

According to (KPA Audit report, 2012-2013) indicated that various freight stations had failed to move 6,000 containers that had been cleared, increasing the pile-up at the port yard to 18,000 Twenty Foot Equivalent Unit (Tues.) against its capacity of 14,500. If the container freight stations (CFSs) move the cargo that is ready, operations will return to normal, but the stations said that KPA had failed to put its equipment to optimal use even as some of them hold up to 2,300 Tues., two times their capacity. The delays at the port is costing importers huge storage charges with containers taking up to 14 days to move from the port to CFSs where most of the domestic cargo is cleared. Importers and clearing agents blame the delay on inefficiency in the freight handling, saying they should be allowed to collect part of the cargo cleared from the port.

According to (Gerald, 2010) the Mombasa Port's facilities are overstretched and under intense pressure leading to complaints from the local clearing and forwarding firms and customers, about Container on container clearance. (Kimani, 2010) reported that KPA unveils new plan to cut red tape at Mombasa port where the commissioner general of KRA blamed the delay to a number of signatures required on the documents which he said were too many and were to be reduced plus port handling equipment breakdown.

According to(Stock et al, 2009) for an organization to operate efficiently, "its supply chain activities should flow smoothly to create value to the customers hence it should minimize delays by avoiding poor /outdated equipment's" The operational Audit report of 2011/2012 points out that the current regulatory framework governing operations of the CFSs is not sufficient to ensure quality and standards of services. The pressure to move Containers out of the port area quickly has occasionally led KPA to nominate CFSs without due consideration of their container handling capacities.

Most of them are congested not only due to lack of sufficient and reliable equipment but also because their operators do not exhibit proper planning in receiving staking and realizing. According to (Maundu,2012), reported that though the corporation has good equipment that can support its quayside operations, these machinery are largely unproductive, raising questions about the capacity of the staff. Importers and clearing agents blame the delay on inefficiency in the freight handling, saying they should be allowed to collect part of the container cleared from the port's yard. Agents said it took them five days to clear and move containers from the port while it takes more than five days for any CFS to transfer containers in a vessel. According to (Kenya Shippers report 2011/2012), Mombasa Port's facilities are overstretched and under intense pressure.

2.3.3. Transport Infrastructure

According to (Rushton et al 2012), defines Transport as "the activity that facilitates physical movement of goods as well as individuals from one place to another. It supports trade and industry in carrying raw materials to the place of production and distributing finished products for consumption". Transport creates value or place utility. It's a factor in the creation of time utility because it determines how fast and how consistently products move from one point to another. He states that value chains begins when vessels, materials or products enters an organization hence there should be continuity in transport services for efficient flow of products along the supply chain. The trucks are responsible for the container transfer operations within and from the port; they are required for the purposes of shunting containers from the port in order to ensure timely evacuation.

Stakeholder's workshop, (2012) reported that Conditions of the Road at Miritini in whose vicinity most CFSs are located. Since April 2011, the road has deteriorated so much that the truck turnaround times for a journey of less than 10 km can take as long as 6 hours which means that truck efficiency and movement of CFS-nominated cargo is severely compromised, trucks that could do five trips at the beginning of 2011 are barely able to move one container a day to day due to poor roads, this in turn leads to more delays in clearing the goods as they are not able to reach the CFSs on time to be cleared.

From the Meeting on the Northern corridor trade and transport logistics chain stakeholders consultative forum (2011) the Port and KRA reserve the right to nominate various CFS for container clearance, importers have faced delays exceeding 10 days waiting for cargo to move from the Port to CFS. The Kenya National Highways Authority reports that it expects World Bank Support to fix the road. However, the country cannot wait that long. Local resources should be utilized to dedicate passage for trucks between the Port

and CFS to increase off take of container." Kenya is faced with the dilemma of high road construction costs and increasing road maintenance due to overloaded trucks plying its trunk route network, particularly along the Northern corridor, World Bank (2007*)*.
KPA's management report 2011/2012, *said* that they have been building there capacity to handle increased volumes of cargo but they are let down by poor infrastructure. Ugandan traders decided to revive the Uganda National Trade and Facilitation Forum *Fig* and form a shippers' council to lobby for the reduction of prohibitive transportation costs emanating from the Northern Corridor. This came about as a ripple effect; delays at Mombasa Port increase their costs and these are passed on to the final customer, resulting in lower sales and profits.
According to Bowersox et al (2010)"Activities related to providing customer service requires performing order receipt and processing, deploying inventories, storage and handling and outbound transportation with a channel of distribution. poor transportation causes delays in delivery as the vehicles consumes more time than the required just to deliver items, goods from one place to the required locations. Transport services should be efficient to cope up with organizations activities and services. The primary physical distribution objective is to assist in revenue generation by providing strategically desired customer service levels at the lowest total cost".
Omondi, (2012) on business and finance said off take of container from the Port is delayed by various factors all within the control of agencies operating within the Port and around it. Off take by road is severely constrained by inadequate number of personnel. While the Port has various gates, it has not utilized all of them because of failures of other organizations responsible for container clearance to post sufficient staff to man all the gates or to equip them adequately once posted there. As an urgent measure, all gates should be utilized and personnel posted there, facilitated with adequate equipment. Off take by railway is constrained by inadequate rift valley railways capacity to lift cargo from the port to hinterland destinations.
According to KPA*s* Annual report(2010) The port of Mombasa is the gateway for surface transport along the Northern corridor region, with an estimated 900 transport vehicles(trucks) exiting each day, on average. Road transport is accompanied by several operational difficulties including weighbridges, police escorts, and road blocks which constitute non tariff barriers and contribute to delays. Rail transport helps in the movement of bulk cargo dry or wet from an industrial plant in a complete train load to a seaport. This may be crude oil, phosphate, coal, timber or iron. Observers point to increased cargo volumes last year following a surge in transit business.
According to the Star newspaper(2012) Freight forwarders and clearing agents urged the government to improve the railway system to help eradicate delays at the port of Mombasa. They said "better Rail system will end port delays.

2.3.4. Space Capacity

According to Gubbins(2011), Space is an adequate area required at the container terminal for storage of containers and for ship berthing. Adequate space is required to avoid congestion, mix up and ease of movement of containers. Ship requires immediate space berth to avoid delays in loading and offloading. Space is required to accommodate all materials received within the organization; this can only be done by a continual review of requirements and the adaptation of practical and sensible storage layout and methods.
Delivery on time is a standard purchasing objective but when faced with inadequate space to secure the goods it leads to congestion and delays to deliver goods to the right destination. If goods and materials arrive late or work is not completed at the right time, sales may be lost, production halted and penalty clauses may be dissatisfied customers (Gillngham et al, 2013*)*. Kenya shippers' association report (2010*)* indicates that from the time a ship docks at Mombasa, the long wait begins taking 10 to 14 days for a ship to be allocated a berth at the port because of inadequate space forcing shippers to pay between $10,000 and $12,000 per day as demurrage fees. After securing a berth, it takes some seven days for a container to be discharged from the ship and another 18 days for the container to find its way to the Container Freight Services (CFS) depot. The port entrance channel is a typical one way channel for larger vessels, this leads to longer vessel inter-arrival times and thus longer vessel waiting times, in 2009 the average ship waiting time in port days for a containerized vessel was 2-3 days.
The World Bank (2010) followed the complains concerning delays in clearing of cargo and released this statement report: "The port of Mombasa has exceeded its design capacity yet it is expected to handle growing imports and exports. It is already operating at maximum capacity for both containerized and general cargo and will suffer progressive declines in operational effectiveness unless both capacity and efficiency issues are urgently addressed". According to KPAs annual report (2010), the container yard seemed to have difficulties in serving ship and gate traffic at the same time. The result is that the STS cranes often wait for yard tractors, a major actor of low crane productivity and subsequently low berth productivity. Thus the terminal is currently congested and increasingly, there is limited space at the terminal to store containers and other goods as container population increases.
According to KPAs statistics (2010) bulk liquid items, mostly petroleum, oil and lubricants are the single greatest import item by weight. The existing container terminal was designed to handle a throughput of 250,000 TEUs per annum through three berths. The terminal has since surpassed this capacity as evidenced by the fact that 2011 a total of 695,000 TEUs were handled through the terminal. The growth in container traffic has put a strain on the existing facilities and compounded the congestion. Also the port entrance channel is atypical one way channel for larger vessels. The maximum allowable length of vessels calling at the port has been set by KPA at 234metres in addition to the maximum allowable draft of 9.4 meters. This limitation results in longer inter-arrival times and thus longer vessel waiting times.
Maundu (2012) reported that the handling of cargo is hindered by the space capacity at the port, The available berths are not sufficient to handle the vessel entering the port and some berths are small that the big vessels entering cannot fit in them causing congestion as they have to wait for long before being allocated the berths.

2.4. Critique of the Existing Literature

The aim of the above literature review was to analyze the studies that was carried out on container clearance with a special focus on, efficiency, effectiveness, reliability and quality delivery services provided

While much has been done on the factors affecting Container clearance in port terminals, the available literature concentrated much on handling systems, space capacity, documentation process and transport infrastructure. The absence of manpower with skills to handle the clearing process and the politics in the coast region has left the operation of the port terminals in crisis and difficult situation.

Therefore, the study attempting to establish these relationships is more necessary for developing applications of such relationships and efficient with a close link to port of Mombasa. Container clearance leads to inefficiency and long dwell time for the clearance of containers. (Brinkerhoff, 2009) identifies three key competitive advantages resulting in high revenues. Advanced technology system put in place, proper transport infrastructure to facilitate fast movement of cargoes from one place to another and well advanced handling equipment that will take the shortest time possible to perform clearing of containers.

(Basheka, 2009) argues that investing in use of advanced technology and information using single electronic window system is the best way to use in clearing the containers in the port terminals leading a big contribute to the success of the economy of the country and increased improved service delivery.

2.5. Summary

This section emphasized on the factors affecting container clearance in the Kenya Port Authority. The factors affecting Containerare documentation process, handling equipments, transport infrastructure and space capacity. It's evident where the Mombasa Port's facilities were overstretched and under intense pressure. There had been complaints from the local clearing and forwarding firms, agents and customers, about delays in containers clearance.

The port had various freight stations failed to move 6,000 containers that had been cleared, increasing the pile-up at the port yard to 18,000 Twenty Foot Equivalent Unit (Tues.) against its capacity of 14,500. Also the daily nations newspaper of June (2010), titled "KRA unveils new plan to cut red tape at Mombasa port" where the commissioner general of KRA blamed the delay to a number of signatures on documents which he said were too many and should be reduced drastically.

Containerized cargo clearance at the port are costing importers huge storage charges with containers taking up to 14 days to move from the port to CFSs where most of the domestic containers are cleared. This situation makes the port to be competitively unfair as countries are going to the port of Tanzania to have their goods cleared from there; hence this situation calls for combined efforts from the government, stakeholders and the clearing agents to improve on it. Transport infrastructure is an important driver to any organization that serves as the element that creates results to a coordinated effective and efficient supply chain. Therefore, it must be current, accurate, validated, and efficient in order to enable movement of the cargoes fast and easily taking little time thus reducing congestion of the containers at the port terminals.

2.6. Research Gaps

While much has been learnt about the factors affecting Containerized cargo clearance, there are several important areas that need further research. The researcher believes that effective communication amongst stakeholders is very important when it comes to making tariff changes or introduction of regulations such as bay plans and interpreting transaction values which should be made with consultations to reduce delays so that port users are prepared with any new changes implemented. Another area is that KPA should come up with a schedule of the vessels expected to dock at the port in a day, week or months so that enough space to accommodate them is created in time to avoid them queuing for a long time waiting for berths, this will ease the process of containerized cargo clearance.

3. Research Design and Methodology

3.1. Introduction

This chapter presents the research methodology of the study. It describes the methods and procedures that was used in order to collect data that answers the research questions. The chapter was presented under the following sections namely, research design, study population, sample size, sampling procedures, data collection instruments and data analysis.

3.2. Research Design

According to Kerling (2014) research design is a plan and structural of investigation so concessive to obtain answers to research questions. It's an outline of what an investigator or researcher will do from writing hypothesis or objectives to the found data analysis. A research design constitutes the blueprint for collection, measurement and analysis of data. It's the measurement of condition for collection and analysis of data in a manner that aims to combine relevance with the following in procedure (Creswell, 2009). Therefore, research design will provide answers to the research questions that the researcher will be able to investigate.

The researcher useda descriptive research design which included collecting information by administering questionnaires to container terminal workers, clearing and forwarding staff and the engineering departments to be able to compile data analyzed and interpret the data from the contents and measuring tools to authenticate the research study. The study under this research was to find out what factors affecting Containerized cargo clearance at the port of Mombasa for effective performances. It aimed to give intense and detailed description of existing phenomenon with intent of employing data to justify and make plans that are more effective.

3.3. Target Population

According to Mugenda,(2009) the population refers to an entire group of individuals, events or objects having a common observable characteristic. Mugenda and Mugenda, (2009) generalize the findings of a study. The population was chosen to delimit the study and gather sufficient data within the limit and cost.

The targeted population in this study was 200 KPA container terminal workers, clearing and forwarding firms, engineering departments and other departments. The target population organized was as follows:

Respondents	Target Population	Percentage of Sample Size	Sample Size
Container Terminal department	60	30	18
Clearing and forwarding department	70	30	21
Engineering department	70	30	21
TOTAL	**200**	**30**	**60**

Table 1: Target Population

3.4. Sampling Design and Procedure

According to Mugenda (2011), for any meaningful and representative research, a sample of at least above 10% is representative enough. Sampling methods involved taking at random a predetermined quantity from a batch of the same kind, a quantity considered adequate and representative of the whole batch. The target population divided in various groups including the container terminal workers, the clearing and forwarding department and the engineering department. In this study stratified random sampling methods was used so as to obtain 4 strata of the selected departments.

3.5. Sample and Sampling Technique

A sample is defined as subject of a population that has been selected to represent characteristics of a population. A stratified random sampling will be employed to obtain a suitable unit representative of analysis. This is because of the heterogeneity of the population and all respondents will all have equal opportunity of participation.

3.6. Piloting of Questionnaires

The questionnaire were field tested by the researcher before the defense of the project to assess the relevance of the questions, the understanding of respondents, identification of any ambiguities, as well as the general availability of the various categories of information needed. The questionnaires were pretested immediately before embarking on serious data collection exercise where there was self-administering to few employees in the port terminal of Mombasa to make sure that the responses given were in line with the expectations. Validity is the accuracy and meaningfulness of inferences, based on the study results. Reliability is a measure of the degree to which a research instrument yields consistent results or data after repeated trials (Mugenda & Mugenda, 2010).

3.7. Data Processing, Analysis and Presentation

The data was analyzed by use of descriptive statistics. This involved quantitative and qualitative analysis. The data collected by various instruments were first thoroughly edited and checked for completeness and comprehensibility. The edited data was summarized and coded for easy classification in order to facilitate tabulation. The researcher analyzed the data using statistical package for social sciences (SPSS) version 22. Tables and charts were used to simplify and clarify research. The relationship between the dependent and the independent variables was as follows;

- $\mathbf{Y=\alpha+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\varepsilon}$
- **Y** = Container clearance at KPA.
- $\boldsymbol{\alpha}$ = Constant
- $\boldsymbol{\beta_1, \beta_2, \beta_3, \& \beta_4}$ = Partial regression coefficient
- $\mathbf{X_1}$ =Documentation process
- $\mathbf{X_2}$ =Handling equipment
- $\mathbf{X_3}$ =Transport infrastructure
- $\mathbf{X_4}$ =Space capacity
- **E = stochastic term or error term**

4. Research Findings and Discussions

4.1. Introduction

This chapter gives response rate of respondents at KPA, demographic characteristics, factors affecting containerized cargo clearance in KPA and regression analysis.

4.2. Response Rate

From the 40 questionnaires administered, 36 of them representing 90.0 % were returned. The data collected was analyzed for mean, standard deviation and coefficient of variation. This indicates a good response for analysis.

4.3. Demographics Characteristics of Respondents

Departments	Frequency	Percentage
Engineering	02	5.5
Clearing and Forwarding	18	50.0
HR	05	14.0
Planning	02	5.5
Procurement	9	25.0
Total	**36**	**100.0**

Table 2: Respondents' Department

The study reveals that majority of respondents studied were from clearing and forwarding at 50% followed by procurement at 25%, HR at 14 % and engineering and planning each having 5.5%.

This means that relevant departments concerned with container clearance were given considerable chance in the study thereby increasing the relevance of the data collected.

Characteristics	Frequency	Percentage
Top Management	2	5.6
Middle Management	18	50.0
Supervisory Management	16	44.4
Total	**36**	**100.0**

Table 3: Respondents' Position

A lot of middle management employees participated in the study i.e. 50%, supervisory management comprising 44.4% and top management 5.6%. This is due to the fact both middle and supervisory management have a lot of influence and information in relation to container clearance at KPA.

Characteristics	Frequency	Percentage
PHD	0	0.0
Masters	10	28.0
Degree	17	47.0
Others	9	25.0
Total	**36**	**100.0**

Table 4: Respondents' Education Level

Demographic characteristics of respondents indicates high level of education for management level staff of KPA with degree accounting for the highest at 47%, masters at 28% and others at 25 %. This is an indication of high knowledge within KPA.

Characteristics	Frequency	Frequency
0-5 years	11	30.6
6-10 years	16	44.4
11-15 years	05	13.9
Over 15 years	04	11.1
Total	**36**	**100.0**

Table 5: Respondents' Work Experiences

Work experiences indicate that majority 44.4 have worked for 6-10 years, followed by 0-5 years at 30.6% and 11-15 years and over 15 years accounting for 13.9% and 11.1% respectively. This indicates that majority of management employees are well conversant with clearance at KPA.

4.4. Factors Affecting Containerized Cargo Clearance at KPA

In the research analysis the researcher used a tool rating scale of 5 to 1; where 5 was the highest and 1 the lowest. Opinions given by the respondents were rated as follows, 5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree and 1= Strongly Disagree. The analysis for mean, standard deviation and coefficient of variation were based on this rating scale.

4.4.1. Documentation Process

	Documentation Process			
	Statements	Mean	Standard Deviation	Coefficient of Variation
B1	Custom clearance and verification process is critical in container clearance	4.1722	0.6941	0.1664
B2	Containerized cargo clearance process is very fast and effective	4.5000	0.6969	0.1549
B3	KPA system used in containerized cargo clearance are efficient and effective	4.3056	0.7077	0.1644
B4	Introduction and use of single window system on containerized cargo clearance has curbed congestion problem	4.0566	0.7538	0.1858

Table 6: Level of agreement to documentation process factor that affect containerized cargo clearance at KPA

The first objective of the study was to establish the effects of documentation process on containerized cargo clearance at KPA. Respondents were required to respond to set questions related to documentation process and give their opinions. The opinion in agreement that Custom clearance and verification process is critical in container clearance had a mean of 4.1722, standard deviation of 0.6941 and a low dispersion of 16.64% signifying a high level of agreement. The finding also indicates containerized cargo clearance process is very fast and effective with a mean of 4.5, standard deviation of 0.6969 and a dispersion of 15.49% signifying a high level of agreement. Opinion whether KPA system used in containerized cargo clearance are efficient and effective was positive with a mean of 4.3056, standard deviation of 0.7077 and a dispersion of 16.444% signifying a high level of agreement.

The opinion whether introduction and use of single window system on containerized cargo clearance has curbed congestion problem was positive with a mean of 4.0566, standard deviation of 0.7538 and a dispersion of 18.58% signifying a high level of agreement. The issue of documentation is in agreement with Lambert et al, (2001) who underscores that one of the most important facets of international logistics is paperwork that must be completed before, during and after shipment of a product to a foreign market, while documentation is not glamorous of global logistics, it is a necessary part.

4.4.2. Handling Equipment

	Handling Equipment			
	Statements	Mean	Standard Deviation	Coefficient of Variation
C1	Port has insufficient handling equipment and machines that contribute to delay of clearing of container	3.8611	1.0731	0.2779
C2	There is lack of enough number of berths to accommodate the container ships	4.2778	1.0032	0.2345
C3	There is lack of adequate machines for loading and unloading containers	4.4722	0.9706	0.2170
C4	Use of automated handling machines and equipment positively affect containerized cargo clearance	3.6389	1.3555	0.3725

Table 7: Element of handling equipment factor that affect containerized cargo clearance at KPA

The second objective was to determine the effects of handling equipment on containerized cargo clearance at KPA. Respondents were required to questions related to handling equipment and give their opinions related to the issue. The opinion in agreement that Port has insufficient handling equipment and machines that contribute to delay of clearing of container scored a mean of 3.8611, standard deviation of 1.0731 and a dispersion of 27.79% signifying neutrality of opinion.

Respondents agreed on lack of enough number of berths to accommodate the container ships as indicated by a mean of 4.2778, standard deviation of 1.0032 and a dispersion of 23.45%. Lack of adequate machines for loading and unloading containers also scored a high mean of 4.4722 signifying agreement. This opinion is in agreement with Bailey et al, (2004) who asserts that one of the most basic requirement of any organization is to be able to transport or move materials, equipment and spares from one point to another The opinion on whether use of automated handling machines and equipment positively affect containerized cargo clearance appeared neutral to the respondents with a mean of 3.6389. This supports Gerald assertion (2010) that the port of Mombasa facilities are overstretched and under intense pressure leading to complaints from the local clearing and forwarding firms and customers.

4.4.3. Transport Infrastructure

	Transport Infrastructure			
	Statements	Mean	Standard Deviation	Coefficient of Variation
D1	Lack of effective transport infrastructure negatively affect containerized cargo clearance	4.2444	0.7149	0.1812
D2	Construction of Dongo Kundu bypass will positively reduce congestion of trailers at KPA	4.3722	0.5829	0.1333
D3	Construction of standard gauge railway will improve containerized cargo clearance	4.5833	1.0522	0.2936
D4	Transport traffic and delay affect negatively container clearance	4.5278	0.5623	0.1241

Table 8: Element of transport infrastructure that affect containerized cargo clearance at KPA

The third objective was to find out the effects of transport infrastructure on containerized cargo clearance at KPA. Respondents were required to give their opinions in relation to some set questions related to infrastructure and containerized cargo clearance at KPA. Respondents were in agreement that lack of effective transport infrastructure negatively affects containerized cargo clearance as indicated by a mean of 4.2444. There was further agreement that construction of Dongo Kundu bypass and construction of standard gauge railway will positively reduce congestion of trailers at KPA as indicated by means greater than 4. Transport traffic and delay was also noted as a big factor affecting negatively containerized cargo clearance at KPA as indicated by a mean of 4.5278 signifying agreement. This is in agreement with Star newspaper (2012) report which saw freight forwarders and clearing agents urging the government to improve the railway system to help eradicate delays at the port of Mombasa. They add that, better rail system will end port delays.

4.4.4. Space Capacity

	Space Capacity			
	Statements	Mean	Standard Deviation	Coefficient of Variation
E1	Inadequate space capacity negatively affect containerized cargo clearance	4.2500	0.7319	0.1743
E2	Setting up port of Lamu will curb the challenges of inadequate space capacity at KPA	4.3611	0.8669	0.1988
E3	Lack of berths has increased delays of congestion during loading and offloading of containers	4.1389	0.9607	0.2321
E4	Creation of CFS within the port has positively reduced congestion of containers at KPA	4.1222	0.6431	0.1560

Table 9: Component of space capacity factor that affect containerized cargo clearance at KPA

The fourth objective was to assess the effect of space capacity on containerized cargo clearance at KPA.
Respondents were required to respond and give their opinions in relation space capacity on containerized cargo clearance at KPA. Respondents indicated that inadequate space capacity negatively affects container clearance with a mean of 4.25 signifying agreement. This is in agreement with Gubbins (2004) who asserts that space is paramount to avoid congestion, mix up and enhance ease of movement of containers. There was agreement with a mean of 4.3611 that setting up port of Lamu will curb the challenges of inadequate space capacity at KPA. Creation of many CFS within and around the port was positively observed to have reduced congestion of containers at KPA. Lack of berths was observed to have increased delays of congestion during loading and offloading of containers at KPA.

4.5. Containerized Cargo Clearance at KPA

	Containerized Cargo Clearance at KPA			
	Statements	Mean	Standard Deviation	Coefficient of Variation
F1	Adequate handling equipment and machines affect positively container clearance	4.0833	1.0790	0.2642
F2	Slow documentation process negatively affect containerized cargo clearance	3.7500	1.0522	0.2806
F3	Traffic congestion and delays negatively affect containerized cargo clearance	4.1389	1.1012	0.2796
F4	Building and setting up of berths positively affect containerized cargo clearance	4.6444	0.7412	0.1559

Table 10: Containerized cargo clearance at KPA

On containerized cargo clearance at KPA respondents were required to respond to some items related to the same. Respondent's opinions indicate adequate handling equipment and machines affect positively containerized cargo clearance at KPA.Slow documentation processes negatively affect containerized cargo clearance at the port coupled with traffic congestion and delays at KPA. In addition building and setting up of berths can positively affect containerized cargo clearance.

4.6. Multiple Regression Analysis

The correlation analysis Table 11 shows the relationship between the independent variables, documentation process, handling equipment, transport infrastructure and space capacity the dependent container clearance at KPA. The analysis indicates the coefficient of correlation, r equal to 0.768, 0.646, 0.776 and 0.773 for documentation process, handling equipment, transport infrastructure and space capacity respectively. This indicates a very strong positive relationship between the independent variables, documentation process, handling equipment, transport infrastructure and space capacity and the dependent variable containerized cargo clearance at KPA.

Coefficients[2]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Correlations		
		B	Std. Error	Beta			Zero-order	Partial	Part
	(Constant)	.658	.136		5.511	.000			
	Documentation process	.483	.137	.282	3.194	0.01	.768	.110	.015
	Handlingequipment	.357	.015	.159	2.950	0.04	.646	.089	.025
	Transport infrastructure	.496	.121	.485	4.111	.000	.776	.594	.121
	Space capacity	.451	.145	.391	3.109	0.04	.773	.488	.092
a. Dependent Variable: Container clearance at KPA									

Table 11: Multiple Regression Analysis Coefficients

1. Hypothesis 1

→ H_0: There is no effect of documentation process on containerized cargo clearance at KPA

β_1=0,

→ H_1: There is an effect of documentation process on containerized cargo clearance at KPA

$\beta_1 \neq 0$,

In relation to the variable documentation process, the results in Table 11 above indicate thatdocumentation process has a significant influence on container clearance at KPA. This is supported by regression analysis t-value of 3.194 which is greater than the critical value 2.0 and a p-value of 0.01 at 95% level of significance which is less than 0.05.Lambert et al, (2010) underscores that one of the most important facets of international logistics is paperwork that must be completed before, during and after shipment of a product to a foreign market, while documentation is not glamorous of global logistics, it is a necessary part.

After testing the hypothesis by comparing the scores of calculated t-value and critical t ; Calculated t-values was, 3.194 for documentation process, which is greater than the critical t_{36-1} (0.05) = 2.0, the study rejected the null hypothesis that there is no effect of documentation process on container clearance at KPA.

Therefore the study accepted the alternative hypothesis that there is an effect of documentation process on container clearance at KPA.

2. Hypothesis 2

→ H_0: There is no effect of handling equipment on containerized cargo clearance on at KPA

β_1=0,

→ H_1: There is an effect of handling equipment on containerized cargo clearance at KPA

$\beta_1 \neq 0$,

In relation to the variable handling equipment, the results in Table 11 above indicate thathandling equipment has a significant influence on containerized cargo clearance at KPA. This is supported by regression analysis t-value of 2.95 which is greater than the critical value 2.0 and a p-value of 0.04 at 95% level of significance which is less than 0.05.

After testing the hypothesis by comparing the scores of calculated t-value and critical t ; Calculated t-values was, 2.95 for documentation process, which is greater than the critical t_{36-1} (0.05) = 2.0, the study rejected the null hypothesis that there is no effect of handling process oncontainer clearance at KPA.

Therefore the study accepted the alternative hypothesis that there is an effect of handling equipment on container clearance at KPA.

This is in agreement with Stock et al. (2013) who argue that for an organization to operate efficiently, its supply chain activities should flow smoothly to create value to customers hence it should minimize delays by avoiding poor and outdated equipment.

3. Hypothesis 3

→ H_0: There is no effect of transport infrastructure on containerized cargo clearance at KPA

β_1=0,

→ H_1: There is an effect oftransport infrastructure on container clearance at KPA

$\beta_1 \neq 0$,

In relation to the variable transport in infrastructure, the results in Table 11 above indicate that transport in infrastructure has a significant influence on containerized cargo clearance at KPA. This is supported by regression analysis t-value of 4.111 which is greater than the critical value 2.0 and a p-value of 0.00 at 95% level of significance which is less than 0.05.

After testing the hypothesis by comparing the scores of calculated t-value and critical t ; Calculated t-values was, 4.111 for transport in infrastructure , which is greater than the critical t_{36-1} (0.05) = 2.0, the study rejected the null hypothesis that there is no effect of transport in infrastructure on containerized cargo clearance at KPA.

Therefore the study accepted the alternative hypothesis that there is an effect oftransport infrastructure on container clearance at KPA.

This concurs with Bowersox et al. (2012) who underscores that poor transportation caused delays in delivery.

4. Hypothesis 4

→ H_0: There is no effect of space capacity on containerized cargo clearance at KPA

β_1=0,

→ H_1: There is an effect of space capacity on containerized cargo clearance at KPA

$\beta_1 \neq 0$,

In relation to the variable space capacity, the results in Table 11 above indicate that space capacity has a significant influence on container at KPA. This is supported by regression analysis t-value of 3.109 which is greater than the critical value 2.0 and a p-value of 0.004 at 95% level of significance which is less than 0.005.

After testing the hypothesis by comparing the scores of calculated t-value and critical t; Calculated t-values was, 3.109 for space capacity, which is greater than the critical t_{36-1} (0.05) = 2.0, the study rejected the null hypothesis that there is no effect of space capacity on containerized cargo clearance at KPA.

Therefore the study accepted the alternative hypothesis that there is an effect of space capacity on containerized cargo clearance at KPA.This is in agreement with Maundu (2012) who observes that handling of cargo is hindered by space capacity.

Model Summary									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.786[a]	.773	.770	.15625	.773	179.329	4	32	.000
a. Predictors: (Constant), space capacity, handling equipment , transport infrastructure , documentation process									

Table 12: Regression Analysis Summary

Table 12 above indicates an overall P-value of 0.000 which is less than 0.05 (5%). This shows that the overall regression model is significant at the calculated 95% level of significance. It further implies that the studied independent variables namely documentation process, handling equipment, transport infrastructure and space capacity have significant effect on containerized cargo clearance at KPA.

Table 12 shows the regression model summary indicating the coefficient of determination R Square as 0.770. This means that 77.0% of the relationship is explained by the identified four factors namely documentation process, handling equipment, transport infrastructure and space capacity. The rest 23.0% is explained by other factors in KPA not studied in this research.

In summary the four factors studied namely, documentation process, handling equipment, transport infrastructure and space capacity explains or determines 77.0% of the relationship while the rest 23.0% is explained or determined by other factors.

4.8. ANOVA

The study used ANOVA to establish the significance of the regression model. In testing the significance level, the statistical significance was considered significant if the p-value was less or equal to 0.05. The significance of the regression model is as per Table 13 below with P-value of 0.00 which is less than 0.05. This indicates that the regression model is statistically significant in predicting factors affecting containerized cargo clearance at KPA.

Basing the confidence level at 95% the analysis indicates high reliability of the results obtained. The overall Anova results indicates that the model was significant at F = 259.329, p = 0.000.

ANOVA[a]						
Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	34.909	4	8.477	259.329	.000[b]
	Residual	.763	32	.032		
	Total	35.672	36			
a. Dependent Variable: Containerized cargo clearance at KPA						
b. Predictors: (Constant), space capacity, handling equipment, transport infrastructure , documentation process						

Table 13: ANOVA

5. Summary, Conclusions and Recommendations

5.1. Introduction

This chapter deals with the summary of the findings and provides conclusions of the findings in relation to the study. It also highlights recommendations and suggestions for further study.

5.2. Summary

From the 40 questionnaires administered, 36 of them representing 90.0 % were returned and analyzed for mean, standard deviation and coefficient of variation. The study reveals that majority of respondents studied were from clearing and forwarding and procurement. Middle and supervisory management employees were studied since they have a lot of influence and information in relation to container clearance at KPA. The study also indicated that majority of management employees are well conversant with clearance at KPA. Custom clearance and verification process is seen critical in container clearance. Inadequate space capacity is seen to negatively affect container clearance at KPA. Setting up port of Lamu was observed as a solution to curb the challenges of inadequate space capacity at KPA. Creation of many CFS within and around the port was positively observed to have reduced congestion of containers at KPA. Lack of berths was observed to have increased delays of congestion during loading and offloading of containerized cargo at KPA.

The correlation analysis indicates the coefficient of correlation, r equal to 0.768, 0.646, 0.776 and 0.773 for documentation process, handling equipment, transport infrastructure and space capacity.

This indicates a very strong positive relationship between the dependent variables, documentation process, handling equipment, transport infrastructure and space capacity and the dependent variable containerized cargo clearance at KPA. Single window system on containerized cargo clearance has been seen as a solution to curb congestion problem in KPA.

After testing the four hypothesis by comparing the scores of calculated t-value and critical t ; Calculated t-values were above 2.0 for all the independent variables studied , which is greater than the critical t_{36-1} (0.05) = 2.0, the study rejected all four the null hypothesis accepted all the four alternative hypothesis.

This implies that the studied independent variables namely documentation process, handling equipment, transport infrastructure and space capacity have significant effect on containerized cargo clearance at KPA.

5.3. Conclusions

From the research findings, the study concluded all the independent variables studied have significant effect on containerized cargo clearance at KPA as indicated by the strong coefficient of correlation and a p-value which is less than 0.05.The overall effect of the analyzed factors was very high as indicated by the coefficient of determination. The overall P-value of 0.00 which is less than 0.05 (5%) is an indication of relevance of the studied variables, significant at the calculated 95% level of significance. This implies that the studied independent variables namely documentation process, handling equipment, transport infrastructure and space capacity have significant effect on containerized cargo clearance at KPA.

5.4. Recommendations

The four factors affecting containerized cargo clearance at KPA are documentation process, handling equipment, transport infrastructure and space capacity among others. The study therefore recommends more improvements and use of ICT supported

systems to support the documentation process. The adoption and use of single widow is a good start to the right direction. Internal transportation is critical for the success of port activities since it positively influences firm performance because it enables efficient movement of cargo thus leading to customer satisfaction. It is also critical for competitiveness. Thus KPA has to invest in internal handling equipment and machinery. The study identifies transport infrastructure as essential for decongesting the port of Mombasa and enhancing efficiency. The government has to speed up the construction of DongoKundu road which is critical for KPA operations. More efforts have to be put in creating more space in the Kenyan ports. In addition to better plant and machinery the construction of Lamu port is critical to port operations in Kenya since it will create more space for ultra modern berths capable of handling bigger ships. The government has a major responsibility in collaboration with private partners and investor to see the realization of the Lamu port.

5.5. Limitations

The researcher faced constraint of access to valuable data due to bureaucracy and this proved time consuming. Time and financial resources constrains ware met and dealt with through proper planning allocation.

5.6. Suggestions for Further Research

The study indicates documentation process, handling equipment, transport infrastructure and space capacity have significant effect on containerized cargo clearance at KPA a public entity. The researcher further recommends research in related areas in the private sector.

6. Acknowledgement

This project would not have been successful without the support and guidance of a number of people who made their contribution in various ways. I would like to express my thanks and appreciation to my supervisor Ms. Lucy Gichinga for her support, patience, motivation, critique, being with me and for all the long hours she took to review this proposal at the expense of her busy schedule. I would also like to thank my classmates for the support and motivation they gave me in making this proposal a success.

Last but not least, to my family for being very supportive Thanks for being with me during the difficult times, for their love, inspiration and encouragement.

7. Acronyms

- → KPA: Kenya Ports Authority.
- → KRA: Kenya Revenue Association.
- → KBS: Kenya bureau of standards.
- → ISO: International standard Organization.
- → CFS: Container freight stations.
- → KEPSA: Kenya Private Sector Alliance.
- → KSC: Kenya Shippers Council.
- → KMA: Kenya manufacturers association.

8. Definition of Terms

Red tape: Doing things without following the right procedure like falsification of documents to have your goods cleared (Bailey et al, 2011).

Stakeholder: Mean a person or a group that has direct or indirect stake in an organization because it can affect or be affected by the organization objectives and policies (Stakeholders report, 2012).

Demurrage: Money paid to a customer when a shipment is delayed at a port or by the customs (Jean, 2012).

Customs: The government department which organizes the collection of taxes on imports and examines the goods (Notteboom, 2012).

Documentation: All documents referring to something (Holgan et al 2010).

Dock: A place where ships can load or unload (H.J. Leavitt & T.L. Whisler, 2013).

Clearance: Passing of goods through the customs so that they can enter or leave the country (Lyons 2012).

Cargo: Load of goods which are sent in a ship or plane (Lambaert et al, 2011).

Berth: A place in a harbor where a ship can be moored (Garcia et al 2013).

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APPENDICES

Appendix I: Introduction Letter

CLIFFORD MILIMU
P.O BOX 95350-80100
MOMBASA

KENYA PORT AUTHORITY
P.O BOX 95009-80100
MOMBASA- KENYA

Dear Sir,

RE: REQUEST FOR INFORMATION CONCERNING ACADEMIC RESERCH WORK

I am a student at Jomo Kenyatta University of Agriculture and Technology- Mombasa campus pursuing a Master's Degree in Procurement and Logistics. As part of the requirement of the course Iam carrying out a research study entitled the, **FACTORS AFFECTING CONTAINERIZED CARGO CLEARANCEAT KPA.** The research study is a partial requirement for the award of Master's Degree in Procurement and Logistics. This questionnaire is therefore issued purely for academic purpose and the information provided will be treated confidential. Your cooperation will be highly appreciated. Moreover your cooperation is ensuring that the questionnaires are answered will be highly appreciated. Please note that the information you give will be treated with confidence and will be used for academic purpose only.

Yours faithfully,

CLIFFORD MILIMU

Appendix II: Questionnaire

Questionnaire for KPA Organization and Clearing &Forwarding

This research questionnaire is specifically prepared to assist in data collection relating to factors affecting containerized cargo clearance at KPA. As a respondent in relation to the study you are kindly requested to fill in appropriate responses at the best of your knowledge. The researcher assures you that all responses will be treated with confidentiality and will only be used for academic purpose.

1. Section A: Background Information.

A job title/Designation (optional)……

A2. What department do you work for in Kenya Port Authority?.....

A3.what is your highest level of education attained?

High school	{ }	Bachelor's Degree	{ }
Certificate level	{ }	Masters	{ }
Diploma	{ }	PHD	{ }

A4. How long have you been working in Kenya Port Authority?

0 – 5 years { }
6 – 10 years { }
11 – 15 years { }
16 – 20 years{ }
Over 20 years { }

A5. What is your current position in Kenya Port Authority?

Top Management { }
Middle Management { }
Supervising Management { }

A6. For how long have you worked in your current position?

0 -5 years { }	16 – 20 years { }
6 – 10 years { }	over 20 years { }
11 – 15 years { }	

2. Section B: Factors Affecting Container Clearance at KPA

B1: How does documentation process affect container clearance at KPA?

5= Strongly Agree, 4= Agree, 3= Neutral, 2=Disagree, 1= Strongly Disagree

	Parameters	5	4	3	2	1
B1	Customer clearance and verification process is critical in container clearance					
B2	Container clearance process is very fast and effective					
B3	KPA system used in container clearing are efficient and effective					
B4	Introduction and use of single window system on container clearance has curbed congestion problem					

Table 1

3. Section C: Handling Equipment

How does handling equipment influence container clearance at KPA?

5= Strongly Agree, 4= Agree, 3= Neutral, 2=Disagree, 1= Strongly Disagree

	Parameters	5	4	3	2	1
C1	Port has insufficient handling equipment and machine that contribute to delay of clearing containers					
C2	Lack of enough number of berths to accommodate the container ships					
C3	Lack of enough machines for loading and unloading containers					
C4	Use of automated handing machine and equipment positively affect container clearance					

Table 2

4. Section D: How Does Transport Infrastructure Affect Container Clearance at KPA?

5= Strongly Agree, 4= Agree, 3= Neutral, 2=Disagree, 1= Strongly Disagree

	Parameters	5	4	3	2	1
D1	Lack of effective transport infrastructure negatively affect container clearance					
D2	Construction of DongoKundu by-pass will positively reduce congestion of trailers at KPA					
D3	Construction of standard gauge railway will improve container clearance					
D4	Transport traffic and delay affect negatively container clearance					

Table 3

5. Section E: Space Capacity

How does space capacity affect container clearance at KPA?

5= Strongly Agree, 4= Agree, 3= Neutral, 2=Disagree, 1= Strongly Disagree

	Parameters	5	4	3	2	1
E1	Inadequate space capacity negatively affects container clearance					
E2	Setting up of another port in Lamu will curb the challenges of inadequate space capacity at KPA					
E3	Lack of berths has increased delays and congestion during loading and offloading of containers					
E4	Creation of many CFS within and around the port has positively reduced congestion of containerized cargo at KPA					

Table 4

6. Section F: Containerized Cargo Clearance At KPA

5= Strongly Agree, 4= Agree, 3= Neutral, 2=Disagree, 1= Strongly Disagree

	Parameters	5	4	3	2	1
F1	Adequate handling equipment and machine affect positively containerized cargo clearance					
F2	Slow documentation process negatively affect container clearance					
F3	Traffic congestion and delays negatively affect container clearance					
F4	Building and setting up of many berths affects container clearance					

Table 5

Thank you very much for your cooperation

Appendix III: Budget Plan

ITEM	ACTIVITY	AMOUNT (KES)
1	TYPE SETTING	20,000/=
2	PHOTO-COPY	20,000
3	BINDING	15,000/=
4	PRINTING	20,000/=
5	MISCELLENOUS	10,000=
	TOTAL	**85,000/=**

Table 6

Appendix IV: Work Plan

	FEBRUARY-JULY 2015	AUGUST 2015	SEPTEMBER 2015	OCTOBER 2015	NOVEMBER 2015
Research Proposal topic presentation					
Proposal development					
Proposal submission					
Proposal presentation					
Data Collection & analysis					
Submission of final project					
Presentation of Final project					
Final project approval correction & Supervisor approval					
Submission of golden copies					

Table 7