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Value-Adding Services as Competitive Strategy: A Multiple Case-Study Analysis of Ports in Developing and Developed Economies

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**HUDDERSFIELD**

**VALUE-ADDING SERVICES AS COMPETITIVE STRATEGY:  
A MULTIPLE CASE-STUDY ANALYSIS OF PORTS IN  
DEVELOPING AND DEVELOPED ECONOMIES**

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**“A thesis submitted to the University of Huddersfield in partial fulfilment of the  
requirements for the degree of Doctor of Philosophy”**

**January, 2011**

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## **Abstract**

Despite the fact that in a general logistics context, value-adding services (VAS) have been acknowledged in various publications, there is a dearth of available empirical works that have particularly investigated the competitive capacity of these services in the formulation of port strategy. Hence, the development of models that are useful to understanding and assessing the capacity of value-adding services in port strategies is necessary to bridge this knowledge gap.

In the context of this study, value-adding services are defined as customised and additional services which complement the core or main offerings of a firm.

A critical realist approach to research was deployed. Questionnaires were used to survey port users, while in-depth interviews were carried out with port management of the multiple case study ports. The case study ports were Rotterdam (The Netherlands), PD Teesport (United Kingdom), Damietta (Egypt) and Apapa (Nigeria) ports. Ten key value-adding services were identified. The research showed that value-adding services may provide a useful input into the competitive strategy of attracting and retaining port users to a port. The services were found to offer opportunities for the diversification of business for port authorities and port operators.

Original contributions of the study include that it brings to the maritime logistics body of knowledge an understanding of the importance of the different value-adding services, principally based on port users' assessment. In sequence, the most important value-adding services were transport service, warehousing, water supplies and technical support, whilst the least important services were canteen/catering and advertising support services. Hitherto, there is no published study that has provided insight into the importance port users attach to various value-adding services.

In port strategy formulation by the deployment of value-adding services, there is a stage in which dynamism sets in and the uniqueness of the services tend to wear-off, requiring concerted rejuvenation to sustain the potential of value-adding services in competitive strategies. The main challenging issues to port management in the deployment of value-adding services in strategy were found to be concerned with legislation, availability of traffic (cargo and vessel), duration of contracts, adequate land and space availability.

The study also developed models, one to stimulate theoretical understanding of port value-adding services, the other to facilitate informed decision-making on the viability of offering value-adding services in ports.

## **Dedication**

*'Halleluiah! – Glory to God'!!*

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# **Chapter 1- INTRODUCTION**

## **1.1 Introduction**

Globalisation of trade has led to an increased importance of ports in the logistics and supply chain network. As the significance of ports increases, fierce competition between ports also intensifies as a result of a scramble for the cargoes of the global economic boom (Haralambides et al.1997; Lobo and Jain 2002). Changes in international trade and shipping greatly contribute to the ever-increasing competition between ports (Yeo et al., 2011). The offering of value-adding services (VAS) is perceived to attract and retain port users to a port. It is acknowledged that deployment of value-adding services has been considered by Bowersox and Closs (1996) and Christopher (2005) as one of the significant strategies to gain competitive advantage. Therefore, there exists the need to investigate the potential of VAS in port strategies.

This study aims to investigate and analyse the views of port-users and port management towards the use of value-adding services in the formulation of port business strategy. According to Slack et al. (2007) business evaluations are carried out to enable informed learning for future development. In this vein, this research will examine the suitability of VAS as a means for competitive strategy in ports through an analytical examination of ports situated in both developing and developed economies.

## **1.2 Research Background**

Dynamism in business environments results in competition and a continual search for strategy development. Competitiveness has been extensively researched (Ma, 2004; Johnson, et al. 2005) and is associated with the strength a firm builds for the purpose of gaining a stronger position in its industry. The 21<sup>st</sup> century has witnessed competition even among firms in industries where rivalry has previously been regarded as being low. In this respect, Powell (2001) indicated that there is a need for

a thorough assessment and reassessment of strategies, geared to create or regenerate competitive advantage. Understanding the business environment will enable a firm to build a suitable strategy (Chan, et al., 2000). Consequently, the knowledge of the changing demands of port-users' businesses might assist a port to thrive better in the port competitive environment.

Currently, ports are becoming increasingly complex, forming what can be described as the most important node in the global network of supply chains. Haralambides (1997) indicated that European ports alone handled approximately 2.5 billion tonnes of cargo annually and have progressively become major nodes in the production-distribution-chain. Ports generally do not have immunity against competition. As with most other businesses, they seek to attract and retain a greater number of customers (i.e. port users). In this light, it is becoming increasingly important that over and above the offer of traditional services, ports' management should seek other means to attract and retain port users.

According to Christopher (2005) value-adding services are powerful means by which a firm can be differentiated so as to achieve a defensible advantage in the marketplace. This is concerned with the capacity of a firm to attract customers and businesses. On the other hand, it is also concerned with the ability of a firm to retain customers, which as addressed by Dyer (1997) has to do with the possibility of a customer who has previously had business transactions with a firm to remain loyal to the firm's future businesses.

Value-adding services in this context are extras, unique or specialized services; different from the generic offers and are tailored to meeting a customer's specific needs (Bowersox and Closs, 1996). These are pointers that the availability of value-adding services might be a reason for customers to patronise a firm.

This study therefore attempts to understand the views of port users about value-adding services and the extent to which the services are deployed as a competitive strategy in ports situated in developing and developed economies. Preliminary work in this area revealed a dearth of specific and thorough research on the potential of value-adding services in a port's competitive strategy. Value-adding services in ports have been

acknowledged (Bichou and Gray 2004; Ugboma et al., 2004), however these studies were broadly carried out in relation to other features, such as cargo handling equipment, turnaround time, ship sailing frequency and port efficiency which tend to overshadow value-adding services. UNESCAP (2003) reported an investigation of the rise in logistics activities that has boosted the commercial strengths of some global ports and discussed value-adding services in ports as a means of encouraging port business growth. While the present study's focus is to give thorough empirical attention to assessing the intrinsic worth of value-adding services in port strategy formulation, the steps in the research process would in themselves prove to be useful insights in steering innovative strategies for port businesses.

Developing an appropriate conceptual research framework is crucial and is founded on clearly identified research problems (Worcester and Downham, 1986; Emory and Cooper, 1991; Brown, 2006). Examination of these key areas of literature thus forms the conceptual framework or background of this study on which the research aims, objectives and propositions shall be reported.

### **1.3 Research Details**

#### **1.3.1 Title**

‘Value-Adding Services (VAS) as Competitive Strategy: A Multiple Case-Study Analysis of Ports in Developing and Developed Economies’

Note: This topic was chosen because the research investigation is on value-adding services' capacity or potential in port business strategy. The reason for having the second part of the topic is because in order to examine value-adding services, case study ports were chosen from ports situated in developing and developed economies.

#### **1.3.2 Research Aims**

- (1) To explore the knowledge and perspectives of the value-adding services' concept.
- (2) To investigate and analyse how value-adding services are deployed in the ports of developing and developed economies.
- (3) To examine and evaluate the influences on port users' selection of ports.

- (4) To assess the suitability of value-adding services as a means to achieving a port's competitiveness.
- (5) To evaluate decision-factors in port management formulation of strategy.
- (6) To develop models for the deployment of value adding services in ports' strategy.

### **1.3.3 The research objectives**

For each of the six (6) aims in section 1.3.2 above, the consequent means (objectives) of achievement are presented as follows:

1. -To survey how value-adding services are carried out in ports (literature and questionnaire)
2. -To examine and analyse value-adding services as offered in samples of port representative of both developing and developed economies (literature, questionnaire and interview, case study ports' database)
3. -To identify various other possible reasons for increased patronage to a port by port-users (literature and questionnaire)  
 -To examine how logistics operations influence port users' selection of ports (questionnaire, literature)
4. -To seek understanding of the adequacy of value-adding services in the port system context (literature, questionnaire and interview, case study ports' database)  
 -To explore the importance of logistics services in the maritime sector (literature)  
 - To critically assess data from literature, questionnaire, interview and case study ports' database
5. -To examine factors affecting port management's formulation of strategy (interviews, port database)
6. -Use of statistical packages to manage and support analysis of all questionnaire quantitative data  
 -Thematic inferential analysis of qualitative data from interviews and comments from semi-structured questionnaire  
 -Analytical integration of information from literature, questionnaire, interview, case study ports' database, experience and intuition

## 1.4 Propositions

### Propositions 1

Using figure 1.1, which illustrates the possibility of VAS pulling port-users to a port from other ports' hinterlands, a proposition is hereby presented.

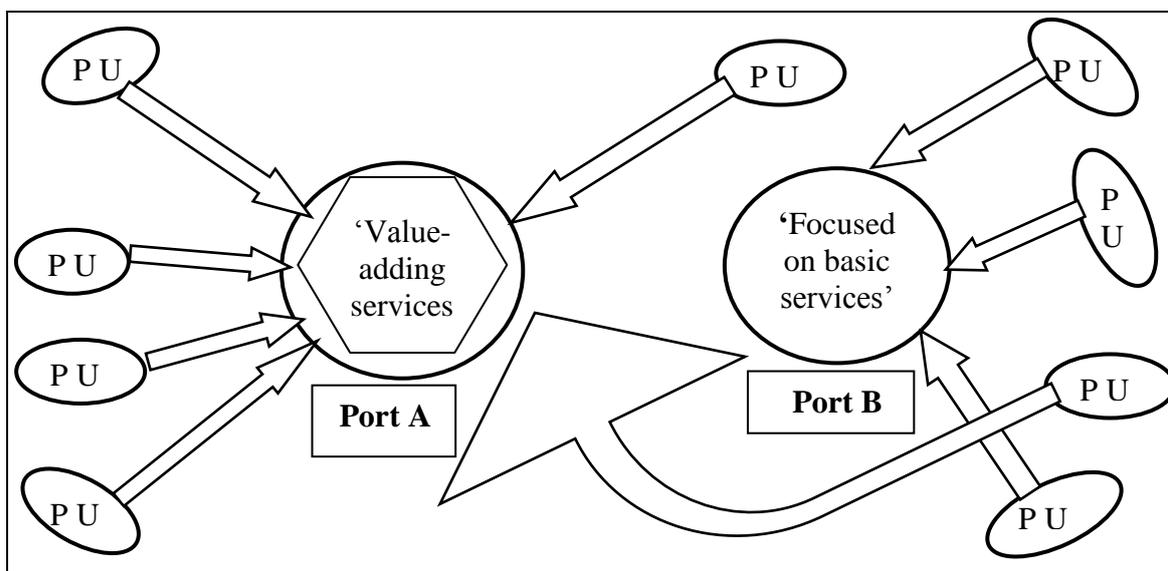


Figure 1.1 Attraction Potential of value-adding services (Source: Author)

The first Research Proposition is: *“the patronage level to a port by port-users is associated with the value-adding services obtainable from that port”*.

\*Note for figure 1: PU represents Port Users and the arrows show the ‘patronage pull’ to either port A or B. This shows the possibility of VAS being able to pull port users to a port from another port’s hinterland. In this line, the null proposition would be that ‘the patronage level to a port by port-users does not have any relationship to the value-adding services obtainable in that port’.

**Proposition 2**

**Value-adding services and retention of port users in a port**

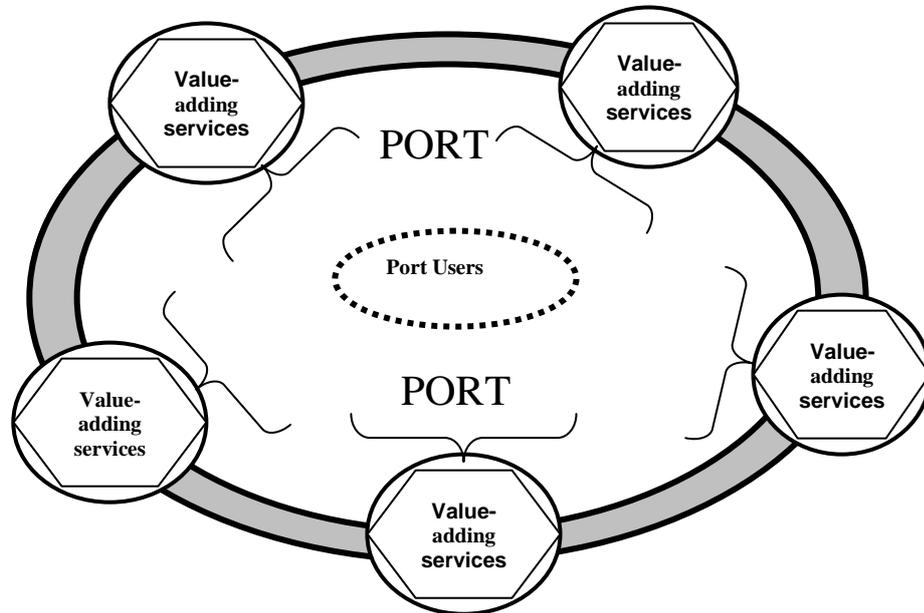


Figure 1. 2 Retention potential of value-adding services in ports (Source: Author)

The second Research Proposition is: *“the capacity of a port to retain port-users is associated with the value-adding services obtainable from that port”*.

\* Note: The second research proposition is supported by figure 1.2, which depicts the potential of retaining port users in a port as a result of the presence of value-adding services. In this line, the null proposition would be that *“the capacity of a port to retain port-users does not have any relationship to the value-adding services obtainable from that port”*.

## 1.5 Research Methodology

In this research, both the objective (related to quantitative and hypothesis testing) and subjective (qualitative related) approaches to research were used so as to gain from their complementary benefits. Figure 1.3 illustrates the triangulation of research strategy used, namely: the review of literature, use of questionnaires and interview. The reason for research triangulation in this study is to reach informed and validated research outcomes by thoroughly accessing, processing and assessing research data from different sources, as encouraged by Boyer and Swink (2008).

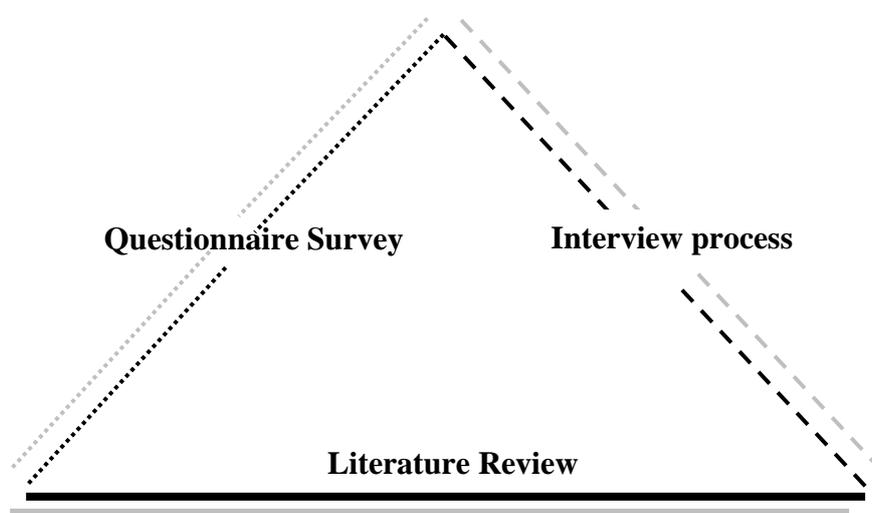


Figure 1.3 : A Triangulation of Research Approach (Source: Author)

With the aid of figure 1.3, the research methodology is explained under the following headings:

### 1.6 Secondary Data (Reviewing the Literature)

The areas under review include an understanding of services, port services, value-adding services, strategy, port competition, case study ports and strategy. The review of literature was set out in a manner to help identify various key issues in the research topic and also as a foundation in developing questionnaires and interview schedules for the gathering of primary data.

## **1.7 Questionnaire**

The use of questionnaires is a versatile means of surveying the views of a research population and can be in different formats (Saunders et al., 2007). It is an appropriate method for this research because it can be designed in a way as to enhance the drawing of data from accredited port users (shipping companies, shipping agents, freight forwarders, stevedores, importers and exporters).

## **1.8 Interviews**

Interviews provide an opportunity for gathering ideas from knowledgeable professionals. The method offers a great deal of flexibility in obtaining the opinions and experiences of practitioners. The choice of interviews was made so as to allow an in-depth discussion of various research issues with port management and professionals to support the cross-examination of opinions of port users from the questionnaires. For further explanation on questions for gathering research data and intended analysis techniques, see section 3.3.3

## **1.9 Reasons for Selecting Case Study Ports**

Given the major aim of ensuring a reasonable opportunity to understand value-adding services' potential, the study deployed multiple case studies of ports situated in developing and developed economies. The use of multiple case studies in research can offer a focused understanding of a subject from different sources (Yin and Heald, 1975; Yin, 2009). In a review of the use of case studies in logistics research, Dinwoodie and Xu (2008) indicated that the deployment of multiple case studies in this area of research is on the increase, with variations to suit different objectives. In the present study, selected Nigerian and Egyptian ports in developing economies and those from UK and The Netherlands in the developed economies will be investigated. The main reason for the choice of countries is that they all have well recognised maritime business history. The reasons for choosing the ports are mainly because they all handle general (various) cargoes, face competition and are major ports in their various countries and regions.

## 1.10 Research Structure in Relation to Research Aims Achievement

Table 1.1 presents the research structure in relation to the research aims achieved in the various chapters.

Table 1.1: Chapters and Achievements

<b>Chapters &amp; Achievements</b>
1. Chapter one: Chapter 1 introduces the research with its details on understanding value-adding services' potential in port strategy. It pointed to areas to be covered in the research project.
2. Chapter Two: Chapter 2 presents various relevant issues and theory in this topical area. While giving attention to other areas, it will particularly enable the exploration of knowledge and perspectives of value-adding services.
3. Chapter Three: Chapter 3 presents relevant aspects of research methodology. The critical realist approach to understanding reality will be adopted in this study.
4. Chapter four: The four case study ports (Rotterdam, PD Teesport, Damietta and Apapa) shall be given focused discussions in chapter 4. Investigations and analyses in the chapter will support the understanding of how value-adding services are deployed in ports situated in developing and developed economies.
5. Chapter five: Chapter 5 primarily presents some of the preliminary analyses carried out, with regards to data collection, piloting, validity, reliability and other statistical perspectives.
6. Chapter six: Chapter 6 reports the results of various analyses carried out to reach the set research aims. Discussions on findings will enable the triangulation and integration of all collected research data.
7. Chapter seven: Chapter 7 discusses further in-depth and inferential analysis, to enable analytical examination and informed recommendations. Areas to be covered include testing of propositions, presenting of port VAS model, assessing the suitability of value-adding services in ports and the evaluation of other influences on port management in strategy formulation.
8. Chapter Eight: Chapter 8 concludes the research work by summarising the findings of the study. Recommendations will be made based on findings. Contributions of the study and areas for possible future research shall be discussed.

## **1.11 Research Relevance**

The core relevance of this research project stems from its uniqueness in bridging a knowledge gap, seen in the following:

- ✓ Hitherto, many publications on ports have given shallow interest in value-adding services, often a mere mention or recognition. This study however has dedicated particular attention to assessing the potential of value-adding services in the strategy of ports.
- ✓ As an evolving concept, value-adding services (VAS) are sometimes confused with other 'value added' concepts. This piece of work differentiates VAS from other 'value added' concepts.
- ✓ The study creates/raises awareness of value-adding services in general logistics area, and more particularly in maritime ports.
- ✓ Opportunities for learning of, and benefiting from, best practices, especially in evolving areas of logistics such as value-adding services concepts are rare. Prospects for the port/maritime industry and academia in developing economies to learn and benefit more from logistical value-adding services have been enabled by cross-studying of practices in ports of developed economies.
- ✓ For objective strategy development, models developed in this study are to support the knowledge of value-adding services and stepwise guidance in consideration of VAS in port strategy formulation.

## **1.12 Summary**

Chapter 1 introduced the research and discussed the conceptual framework with its details on understanding value-adding services' potential in port strategy; chapters 2 and 3 will respectively present various relevant issues on theoretical perspectives based on the literature and the research methodology. Chapter 4 discusses the selected case study ports. The 5<sup>th</sup> chapter presents some of the preliminary analysis carried out, which include data collection piloting, validity, reliability and other statistical measures of the research. Analytical discussion of all research data will be reported in chapter 6 while the 7<sup>th</sup> chapter presents in-depth inferential discussions such as the examination of tested of propositions (hypotheses) and other salient issues. In chapter 8, the study will be concluded by providing summaries of various research issues and findings correspondingly.

## **Chapter 2 - Theoretical Perspective of Research**

### **2.1 Introduction**

This chapter is principally an analytical examination of relevant publications by other scholars and organisations in connection with this research area. The relevance of insights gained by thorough review of the literature in the quest to understand past and present events or knowledge in a particular area of study cannot be overemphasised (Kervin, 1992; Booth, 2003; Hofstee, 2006). By the review of the literature therefore, this chapter presents the theoretical base and builds the conceptual framework of this study, upon which further investigations to meet set research aims can be carried out.

Some of the main areas covered in this chapter include strategy, maritime ports logistics trends, competition in global maritime ports, choice of port factors, understanding services, value-adding services and ‘value-added concept’, and value-adding services in port logistics.

### **2.2 Focus on Strategy**

Strategy is concerned with the direction and scope of an organisation over a long term (Johnson et al. 2005). It encapsulates the logical setting and understanding of policies, methods of control, goals and principles for which resources and competencies are accordingly configured so as to attain the core purposes of the organisation in the ever changing business environment (Jenkinson, 1995). A wide range of corporate behaviour is described in the framework of an organisation’s strategy. While recognising the difficulty in reaching an all accepted definition of strategy, Wit and Meyer (2004) put forward that it is conceived as a course of action for achieving an organisation’s purpose. Though strategy might be change-related, it is also about stability and maintaining the status quo (Fletcher and Hardill, 1995). Porter (1980) held that corporate strategy provides a coherent model for all business units and ensures that all those involved in strategic planning and implementation follow common goals. The various ongoing opinions on strategy point to the fact that it has a capacity to focus an organisation on the course of actions to achieve set goals.

The subject of strategy has received wide attention from scholars and practitioners and has been subjected to varying perspectives and interpretations of meanings. Hence, there really tends to be a 'no fit for all' nomenclature and inclination to strategy. As acknowledged by Professor Porter of the Harvard Business School: 'Strategy is a difficult word, but whatever people want to call it, there is something out there which means positioning oneself more effectively than one's competitors to meet customers' needs (Porter, 1980). This referred positioning is connected with strides to reaching and maximising the purpose of being in business, reflected in the aims and objectives of organisations. In practice, it is recognised that most organisations do their businesses in a very dynamic market environment. Some of the factors that have made the contemporary business arena increasingly complex include technology, rapid changes in customer expectations, globalisation and competition.

As the business environment becomes more challenging, most players tend to consider and reconsider the ways to steer their organisations to fulfilling the expectations of their stakeholders. Consequently, organisations are given clear focus on how to progress and the extent to which business activities can be run in a particular period of time. For success in business, Frankel (1989) suggested that meaningful strategic objectives must be developed to reflect the goals. Given dynamism in business, Miles and Snow (1984) and Pfeffer and Salancik (1978) advocated that the development of strategy should be an issue of high priority so as to consistently align the direction of an organisation with the market environment.

This dynamism in the market environment necessitated the recommendation by Porter (1985) that in order to maintain superior performance in an industry, firms amidst strong competition should consider continual strategizing for competitive advantage. As a prerequisite to attaining competitive position in an industry, Mattson et al. (2006) argued that a pivotal feature of building strategy is in knowing how to construct a successful mechanism to deliver value to the market. They maintained that the knowledge of this mechanism is particularly found among those who operate at the frontiers of firm-customer interface. This line of thought put customers and awareness of customers in the front line of priorities, if a firm is to attain and sustain competitive position in its market. An example of strategy which involved this sort of

direction alignment was found in a report by Parola and Musso (2007) about shipping liners (carriers) resorting to the deployment of large vessels and multi-port as a result of changing demands of customers.

Strategy therefore can be said to provide the driving force by which an organisation's goals and objectives are pursued, giving a pattern of both proactive and reactive policies and actions. There is a tendency to view corporate strategy as emanating from the urge to give solutions to problems or challenges faced by an organisation at a particular time. It might be preconceived, hence referred to as intended strategy or somewhat ad hoc, in which case it can be described as emergent strategy (Wit and Meyer, 2004; Johnson et al. 2005). Although it might seem like stating the obvious to say that strategy involves innovative processes, however Lopez-Fernandez et al. (2008) reported that the pattern and manner of innovation in the service sector have received little research attention, while emphasising the fact that the service sector is of great importance in the growth of economies. The logistics industry can be referred to as an important aspect of any economy and hence requires continual research attention.

### **2.3 The 3-Dimensions of Strategy**

As a result of the divergence of the philosophy of strategy, many perspectives have evolved. However, in order to further understand the notion of strategy some of the fundamental aspects for discussion include the process, content and context of strategy. These aspects of strategy process, content and context are distinguishable three-dimensions of strategy (Wit and Meyer, 2004).

#### **2.3.1 Strategy Context**

Organisations do not exist in isolation but are embedded in an environment where there is an exertion of phenomenal influence on their strategy and operations. The notion of strategy context therefore is concerned with exploration of an organisation's internal strength in relation to understanding the impact of the external environment such as the industry, politics, economy, technology, legislation, geographical location and the physical environment in the course of establishing a corporate direction

(Johnson et al. 2008, Wit and Meyer, 2004). As far as corporate strategy is concerned, the components that make up the strategy context are becoming increasingly complex, resulting in an ever dynamic rise of threats and opportunities to an organisation.

For instance, in addressing strategy issues with regards to performance evaluation and control, Johnson et al. (2001) reiterated that many firms have taken initiatives for organisational change so as to sustain and improve their competitiveness. In this sense, a firm can decide to play a significant proactive role in shaping the context in which its strategy is formulated and business operated, thereby exercising leadership. On the other hand, a firm can become more inclined to reactions in the context of its strategy, responding to trends surrounding its existence.

### **2.3.2 Strategy Content**

There are widespread alternatives in dealing with issues of strategy. In addressing any particular organisational strategic issue, the chosen constituent(s) or the course of action(s) that finally become the product of the formulated direction is referred to as strategy content (Wit and Meyer, 2004; Johnson et al., 2008). These strategy-building materials are thus different at the various strata of a firm, depending on the nature of strategy being pursued.

In a related perspective, Grant (2010) encouraged objective appraisal of resources, to enable effective decisions concerning choice of strategy constituents. Painstaking research efforts should therefore be put in place in the development of strategy content so as to achieve success in a particular endeavour of interest.

### **2.3.3 Strategy Process**

There are literally several ways in which business issues can be addressed. In essence therefore, strategy process is concerned with the approach or means by which an organisation addresses strategic issues and puts into action the formulation and management of its chosen strategies (Hill and Jones, 2007; Johnson et al., 2008).

Traditionally, strategy process is considered to be linear-stepwise stages of analysis, formulation and implementation, but this view has received strong criticism by strategy scholars who propagate imagination and judgement as being more important than analysis and logic (Wit and Meyer, 2004). When viewed from another angle, strategy development process falls into two approaches, the ‘classical’ school of thought or planning approach towards strategy formulation and the ‘emergent’ approach (Mintzberg, 2007; Johnson et al., 2008; Kenny, 2006; Whittington, et al., 2006; Bamford and Forester, 2003; Mintzberg, 1994).

Whereas the conventional view is a planned strategy process, arguments that strategy does not necessarily follow such stereotypical stages have enhanced understanding of an aspect of strategy process as being emergent. According to Johnson et al. (2008), the strategies organisations actually pursue are mixtures of both planned (intended) and emergent strategy processes.

### **2.4 Maritime Ports Logistics Service Trends**

Re-engineering of an organisation’s services is associated with strategy formulation and has been identified as being very important (Edvardson, 1992; Mascio, 2007) as a positive response to market competition and ever increasing customer demands. As competition increases between ports, it becomes more meaningful to give categorical attention to the various trades (businesses) of a port. Goss (1990) stated that the extent and form of competition concerning port’s trade might have considerable variations in ports at different phases. For example, new ports would concentrate on new inland links and the development of cargo-handling systems. The implication therefore is that suitable and competitive strategies during the different stages of port

development should be dynamic and proactive in nature. In order to be able to develop strategies in ports therefore, it is imperative to explore and have a profound understanding of the services for which maritime ports are in business.

#### **2.4.1 Integrated Port Logistics**

According to Bichou and Gray (2004) the major concepts concerned with integration of the supply chain are inter-modality and organisational aspects of integration. Modern ports have generally experienced rapid developments in becoming inter-linking points for different modes of transports, hence an accelerator of inter-modal transport integration. Mangan et al. (2008) supported the view that in addition to the traditional role of freight transshipment, there are various roles the ports can play within the supply chain. Also, given the position of ports in the distribution of materials and products, they have consequently become nodes for the integration of various global supply chains. An example of a port that has a developed integrated logistics system is the port of Singapore, which is one of the world's top hub ports for the facilitation of distribution and related services (MPA, n.d).

The emergence of the containerisation of cargo, an innovation by Malcom McLean in 1956 (Cudahy, 2006), has increasingly contributed to modern ports' economic importance, complexities and roles as major integration nodes for transportation networks (Fetherston, 1984; Lowe, 2005). This has boosted the evolving notion of 'port centric logistics', advocating the potential of ports to be centres for the provision of distribution and other supporting activities (Analytiqa, 2007; Wall, 2007). These depict the advancement of ports from the integration of internal activities to the integration of logistics activities beyond port boundaries to the network of transport and supply chains.

#### **2.4.2 Trends in Modern Shipping**

Mega-ships have emerged to handle the transportation of cargoes of the global economic boom. The use of larger vessels by shipping lines is mainly to take advantage of the economies of scale created by the movement of large volumes of goods. There has also been an appreciable rise in the number of small and medium

sized sea vessels, most of which are used for feeder-services to mega-ships whose sizes oftentimes restrict them from sailing further into territorial waters, and hence having to berth midstream. The prominence of shipping companies and their involvement in various port logistics and inter-modal operations have consequently put shipping lines forward as the prime actors in ports and choice of ports (Voorde and Winkelmanns, 2002).

Increasingly, various collaborations among shipping lines have evolved, making ship operators very influential even in issues of port strategies. Martin and Thomas (2001) supported this view, stating that the formation of global alliances and consortia among shipping lines favours them in exerting considerable pressure on ports; not just to improve productivity and provide new facilities, but also to renegotiate port charges and terminal contracts. While Parola and Musso (2007) recognised the growing influence of shipping lines on ports as a result the formation of consortia, they reported changing trends among the top shipping lines players (e.g. Maersk, Evergreen, MSC, CMA-CGM) in which the need for alliances as a competitive strategy among the global carriers is disappearing.

These trends in shipping are largely directly concerned with the shipping lines; and given the focus (aims and objectives) of this study, other port users and businesses worth consideration include:

- **Stevedores:** Generally, stevedores are companies or units (traditionally small) that are designated by shipping lines and ship agents to primarily engage dock labour to stow or unload cargoes onboard marine vessels (Martin and Thomas, 2001; Branch, 1977, Soppe et al. 2009). Given the surge of international trade, ports have increased in relevance in the global market, resulting in the emergence of gigantic shipping lines as the major means for worldwide mass cargo transport. In this light, it is only natural that other companies involved in the activities of the ports would rise to the challenge by a corresponding growth.

Parola and Musso (2007) reported that as new economic trends began to surface in the ports (such as privatisation and merger of shipping lines), globalisation of the stevedoring business began with global operators as

Hutchison Port Holding and PSA leaving the shores of their bases in Hong Kong and Singapore, respectively, so as to strengthen their competitiveness in the business. Today, a number of key shipping lines in the bid to facilitate their interests and operations in ports have through different deals, become active members of the stevedoring industry.

- **Shipping Agents:** It has been typically the case that shipping lines, given that most of their operations are abroad, or rather global, appoint shipping agents to act as representatives. Shipping agents services include making prior arrangements for vessels' arrival and carrying out ship husbandry duties such as load brokering, cargo booking, document handling and payment collection from shipping lines' customers (Branch, 1977, Martin and Thomas, 2001). Hence, it is recognized that shipping agents provide fundamental services for the effective running of shipping line's businesses.

A particular strength of shipping agents, to the advantage of the shipping lines, is the ability to use local knowledge to liaise and provide necessary information about the call and departure of vessels to the customs, immigration departments, port health, berth officers and others (ICS, 2007). For improved efficiency, local knowledge of a particular market terrain is crucial, especially in global businesses such as the shipping and port industries.

- **Freight Forwarders:** For individual shippers or companies who do not have a dedicated shipping department, freight forwarders act as their specialist agents, coordinating the majority of maritime and inland transport operations to facilitate cross border movement of goods for which a fee or commission is paid (Murphy and Daley, 2001; Martin and Thomas, 2001). At times some of the services of different port users could be seen as overlapping, as a result there can be various slight offshoots in an attempt to define freight forwarding.

The freight forwarding business is typically global in nature, and in recent times has become more and more diversified, offering various intermediary services like freight payment, route recommendations and expedition of

shipments (Murphy and Daley, 2001). These are clear pointers that the freight forwarding port business is rapidly expanding. MBD reported that in 2007 the UK freight forwarding market reached an estimated value of £16.62 billion, which represented a 3% increase (MBD, 2008). Also, the choice of port is mostly determined by shippers and forwarders (Port of Rotterdam, 2009a). More often than not, it is expected that shippers, being the owners of goods to be exported to consignee(s) would have greater influence on the choice of port. However, the report of the port on the increasing capacity of freight forwarders in determining choice of port reiterates their increasing importance in the port industry and indeed the maritime sector.

## **2.5 Competition in the Global Maritime Ports**

Contrary to what used to be the case in the 19<sup>th</sup> and first half of the 20<sup>th</sup> centuries, during which ports were regarded as instruments of states and colonial powers to control markets resulting in minimal competition, most ports are today competing tremendously on a global scale (The World Bank, 2007). There has been a unique trend of business expansion and competitive strategy in the maritime sector, as observed in the emergence of global ports operators, who in addition also run shipping lines. Ports are fundamental bodies in global shipping and logistics (Bichou and Gray, 2004), and the evolution of global port operators is viewed as an indicator of the attempt of ports to gain further control of the supply chain. According to Cheon (2009), the most distinguished issues that have necessitated port restructuring to the intensification of global operators are the forces of intra- and inter-port competition. By implication therefore, the relevance of ports in the global business chain has exacerbated competition between ports.

It is crucial to point out that Haezendonck and Winkelmanns (2002) viewed port competitiveness as a reflection of the strengthening or weakening of market share in various traffic categories. Increasingly, competition between ports has brought about multifaceted demands on the management of ports to satisfy diverse customers and remain in an enviable business position when compared to other ports. Different forms of port competition are known to exist among operators in the same port, between ports in a particular country, ports in different countries and ports in a range

or coastline (Mangan et al. 2008; Goss, 1990). An example of coastline or range port competition is that which exists along the Le Havre-Hamburg range, which stretches from France to Germany. According to Martin and Thomas (2001) ports' terminal operators in Europe have experienced a highly competitive environment, in a tussle to retain or attract shipping lines' businesses. Shipping lines are undoubtedly, the 'chief' among port users.

The thrust to retain and attract port users has been a core goal of all maritime ports. This therefore underscores the basis of the propositions (see section 1.4). This is in line with the recognition that the competitive tussle between ports is mainly geared towards attraction and retention of port users, and achievement of the most efficient total service (Heaver, 2006; Voorde and Winkelmanns, 2002). As is the case in other businesses where customers are the vital focus for strategy, the attraction and retention of port users are the main reasons for port competition.

Most ports therefore invest in the various aspects of their businesses in an attempt to attract and retain port users. The level of returns received as a result of investment on new port facilities depends on the investments made by competing ports (Anderson et al., 2008), as there would tend to be a cargo shift from the old and less efficient facilities to the newer and more efficient facilities. This is a pointer to the view that investing for improved port facilities can be a formidable force in the attempt to competitively draw more ports users and cargoes. Does it then imply that old facilities are commonly inefficient? This might not be the case. As strides in international trade and shipping encourage competition (Yeo et al., 2011), some of the factors that can further influence the competitiveness of ports according to Voorde and Winkelmanns (2002) include the type of port management, the level of expertise of managers and port authorities, good application of EDI, government intervention and added value.

Also as rightly observed by Carbon and Martino (2003), the competitive position of ports is no longer determined by internal strengths alone, but is increasingly dependent on the effectiveness of their integration with the supply chain. It is understood in this light that the strategies of customers in the supply chain can hugely affect port users' patronage to a port. Thus the entry of port users into business contract with other supply chain stakeholders with different interests in choice of ports can be enough to cost a port good proportion of its business.

### 2.5.1 Hierarchies of Port Competition

Similar to the complexities of modern ports, competition between ports has also assumed a complex nature from various frontiers (Ducruet et al. 2010; Ircha, 2001). The intensity of competition a particular port experiences varies widely according to issues which include location and nature of goods handled. While some economies have one or few dominating ports, others such as Great Britain, have many ports. Competition therefore increases, as a result of numerous ports and also because of other factors as good internal transport systems (Goss, 1990). In connection with port competition, it is a well known principle of port geography and port economics that no port is an isolated phenomenon, but belongs to a port group, hierarchy or complex which is functionally interrelated on a local, national or international level (Hoyle and Charlie, 1995).

A port therefore, has some natural or built features, for example location and a developed integrated transport network, which largely determine its functional hierarchical status, and in turn reflects the type of competition it might experience. Since some of the features of a port are prone to changes, it thus implies that there is an expectation of phenomenal dynamism in the level or hierarchy of competition a port might face amidst other proactive ports.

Figure 2.1 identifies the different hierarchies of port competition.

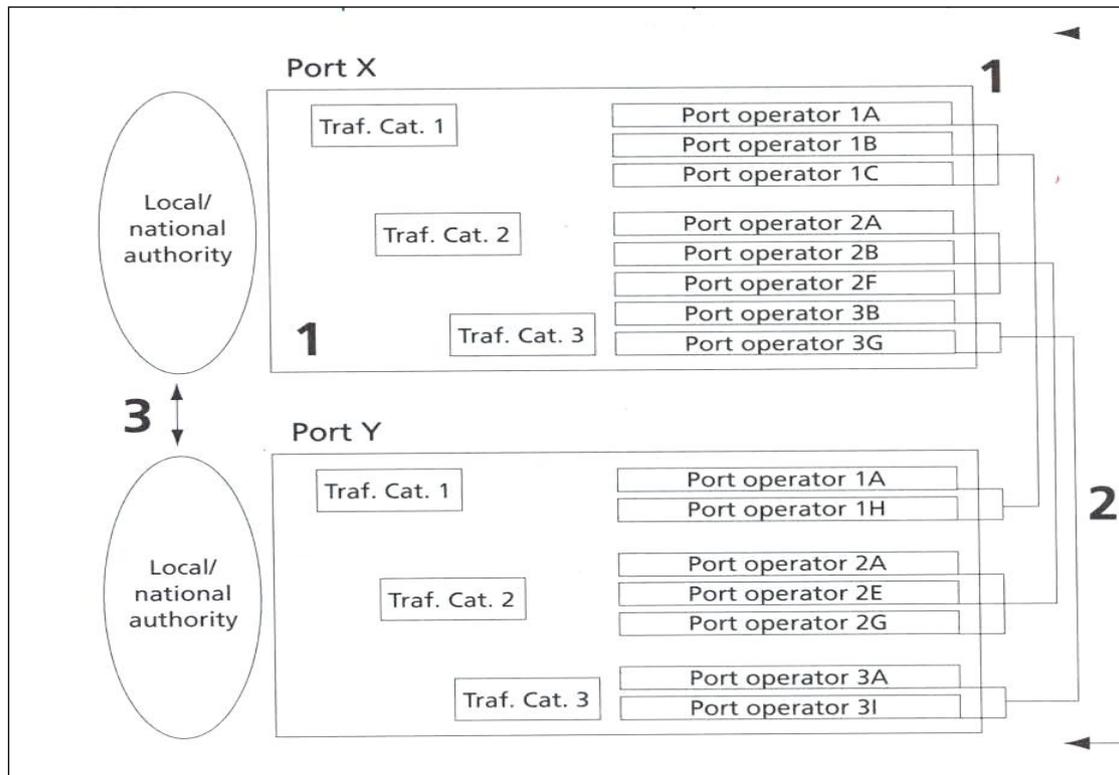


Figure 2. 1: Hierarchies of Port Competition [Source: Voorde & Winkelmanns (2002)]

### 2.5.2 Intra-Port Level Competition

Competition at intra-port level is viewed as the first level of port competition, where different terminal operators in a particular port vie for goods. In this level (feature '1') as illustrated in figure 2.1, the competition among operators ( A, B, C....) in the same port is shown in various categories (i.e. Cat. 1, 2, 3). That applies to traffic for ports X and Y respectively. Active intra-port competition is perceived to be beneficial for a port's competitiveness, national and regional economic growth and ultimately for shippers and consumers of goods and services (CEU, 2004; Langen and Pallis, 2007). The trend of intra-port competition is expected to continue as more and more ports become privatised and with a greater participation of global port operators. It is believed that rather than mar a port's position in the industry, well harnessed intra-port competition could strengthen a port's prowess in attraction and retention of port users.

### **2.5.3 Terminal Level Inter-port Competition**

A situation where terminals of different ports compete is referred to as terminal level inter-port competition. Voorde and Winkelmanns (2002) are of the view that this type of competition mostly occurs between terminals in ports like Hamburg, Bremen, Amsterdam, Rotterdam, Antwerp, Ghent, Zeebruges, Dunkirk and Le Havre (i.e. the Hamburg – Le Havre range), which have common route and geographical areas overlapping each other's hinterland. It is worthy of mention at this point that the overlapping of seaports' hinterlands, as held by Goss (1990), has been grossly encouraged by the development of inter-modal transfer systems and improved long-distance land transportation network.

### **2.5.4 Inter-Port Competition (Authority Level)**

With reference to the feature '3' in figure 2.1, inter-port competition is concerned with competition between ports on a local, national or regional basis. It has a significant influence on the type of infrastructure and superstructure provided in a port, hence also impacts on terminal operations. Competition between ports in different countries can result in significant effects on national policies, where some kind of expansion support and publicity are given to ports, because of national pride (Goss, 1990; Doonslaar and Kolkman, 2010).

Some other forms of competition that port authorities grapple with include:

- Port Range Competition: Otherwise referred to as coastline competition; where ports roughly situated along a common route engage in competition.
- Maritime Ports versus other transport modes: Non-maritime transport modes that mainly use other kind of terminals (nodes), for example airports, have increasingly competed for cargoes that pass through seaports.

### **2.5.5 Privatisation of ports (concession)**

One of the distinct strides that have contributed to the spurring of competition among ports is privatisation. Privatisation of ports dates back to the early 1980s, with the establishment of Associated British Ports (ABP) and its opening for private investors; this move which began in Britain continued in many other countries such as Malaysia, Philippines, Italy, Thailand, China and New Zealand (Parola and Musso, 2007). To a great extent, it is believed that allowing private investors, instead of governments, to be key players and leaders in businesses, not just in ports, would encourage market forces that results in balanced competition in business. There have been extensive port reforms in recent past decades, which led to many governments in both developing and developed economies having to devolve less of port operations and assets to local public entities, but increasingly to private and commercial driven entities (Brooks and Pallis, 2008). These reforms are fundamentally about structural change, which according to Citen and Cerit (2010) has also been encouraged by the need for ports to retain competitiveness.

### **2.5.6 Port Privatisation Trends**

One of the key recent strands of policies aimed at improving efficiency in the port industry is privatisation, which among other reasons is primarily motivated by the economic benefits (Cullinane and Song, 2002). The term privatisation has evolved to be related to different facets of concepts such as liberalisation, deregulation and denationalisation. Within an economic context, privatisation essentially means the sale of publicly owned assets by the transference of ownership from public to private sectors (Thiemeyer, 1986). The perspective or argument of privatisation advocates is that the scheme will create greater operational efficiency. On the other hand, the usual contention by opponents is that the profit drive of private firms will result in the exploitation of customers. With these different arguments in view, a study of the world's top 100 container ports by Baird (2002) reported that while there is no particular approach to port privatisation, findings generally pointed to the public port authority/private concession or lease model as being used more often than others. Tongzon and Heng (2005) advocated that the landlord-operator's structure (public and private) form of privatisation is more appropriate for improving port operation

efficiency, as opposed to full privatisation. Thus, they concluded that this form of partial port privatisation is an effective means for port authorities and operators to gain competitive advantage.

The privatisation of port initiative which started in a developed economy (Parola and Musso, 2007), has since been considered as necessary for ports of developing economies in order to achieve greater efficiency in port operations (Shashikumar, 1998; Neil, 2004). Therefore, the decision for privatisation and the model of privatisation to be adopted in a port are substantially concerned with the port's strategy and competitiveness.

## **2.6 Main Influencing Factors in Choice of Ports**

This section is dedicated to considering some of the influencing factors in the choice or preference of a port over others. Contemporary technological advances have continued to have impacts on port users' choice of port. In fact, these advances have and are expected to keep exerting influences on other port selection criteria. Some of the major factors of influence in port selection are discussed below.

### **2.6.1 Cost and Pricing**

There is an indispensable influence emanating from generalised cost on the choice of port (Voorde and Winkelmanns, 2002). These generalised costs include peril of loss, cost of time, money expense and damages. For instance, ship turnaround time in a particular port is a very important element in determining the choice of port. This consideration of time is particularly crucial in order to avoid the costs of demurrage and delays in meeting other schedules, especially for ships on time voyage charter. The indication here is that shipping lines, shippers and other port users, make assessments based on cost elements, and thereafter reach informed decisions.

For pricing however, Anderson et al. (2008) indicated that it can essentially be determined by competitive market forces or by joint agreement between the ports to maintain market shares, and check imperfect market competition. Competition is a major factor that has stimulated the pressures of rising prices in the transport sector (MBD, 2008).

### **2.6.2 Cargo Handling Facilities**

The trend towards the use of larger ships makes it often the case that large ships can only be received by larger ports which have well developed facilities (Department for Transport, 2006). By inference, cargo handling facilities are of paramount importance for port users' businesses. In a competitive game-theoretic analysis of Busan (Korea) and Shanghai (China) ports, Anderson et al. (2008) indicated that an investment stage would be reached where competing ports do not receive returns (attraction of cargoes) on investments, because one port's investment would be counterbalanced by another's. Ports can differentiate their services by paying attention to the speed of loading and unloading of cargoes for ocean carriers and inland vehicle carriers (Talley, 2006). The availability of superstructures in ports is one of the most important port-rating factors; and their not being readily available contributes to major delays in ports (Murphy et al., 1989).

### **2.6.3 Inland Infrastructural Network**

Connectivity and accessibility with the hinterland is crucial for a port's business. Haezendonck and Notteboom (2002) viewed the competitiveness of a port as being only partly determined by its internal strengths and weakness, emphasising that influences of the logistics network also affect its prosperity. For instance, ships are likely to use ports which have railheads and good access to a major road system (Department of Transport, 2006). Other types of relevant infrastructural needs in ports include storage facilities, safety and security gadgets and administrative centres.

### **2.6.4 Size of Vessels**

The latest generation of container ships have the capacity of almost 10,000 TEUs (Twenty foot Equivalent Units), and as a result shipping lines have reduced the number of ports they serve directly (Department of Transport, 2006). This can largely be traced to constraints of manoeuvrability imposed by huge ship sizes in relation to the routes and channels leading to ports that are further inland. Such emergence of huge modern seagoing vessels has been possible given advancement in technology.

### **2.6.5 Location (Geography)**

The geographical locations of ports are certainly important for port users while considering ports to use for shipment of cargoes. For instance, a key advantage of Dubai is that it is ideally positioned along the trade corridor between Europe and Asia, thus the Dubai government has constantly sought to exploit this advantage in competitive positioning DPW (Dubai Ports World) (Mangan et al., 2008). A port might be located in an area of better proximity to main shipping routes or where effects of tidal movement are more stable in a manner that turnaround time is enhanced. There is a substantial tendency for the selection of a port to increase because the port's location favours a shipment route of a particular cargo trade.

### **2.7 Understanding Services**

Although there tends to be no unified perspective as to what service stands for (Edvardson, 1992), given different perspectives; the word 'service' is fundamentally used to represent the offers of an industrial sector that does things and not the making of things (Johns, 1999). Therefore, the end products of services are essentially activities rather than total creation of tangible products. Generally, service is considered to have constituents, which vary in complexity from one service to another.

Understanding the meaning of 'service specification' might prove beneficial in the comprehension of the word 'service'. Service specification is concerned with the agreement between a customer and service-provider about the various features expected in the rendered service (Galetzka, et al., 2006; Van-Raaji and Pruyn, 1998). Again, Edvardsson and Olsson (1996) emphasised the need to seek understanding of how to improve the quality of services, through academic research and action learning. This is related to enhancing customers' expectations based on the service specifications.

As a follow-up, attention will be given toward contributing to the development of the meaning of 'service', which would further assist the understanding of the term.

Although the meaning of ‘service’ seems to be obvious, yet it does appear that the development of a definition needs to be given more attention in the academic literature.

### 2.7.1 The Process of Services

Gronroos (1990) associated service as being a series of activities of more or less intangible nature, that usually though not necessarily, occurs in the interactions between customers and the service providers’ employees. By ‘simple-constituent service’ in figure 2.2, representation is made of services in which customers’ requirements can be viewed as being straightforward or uncomplicated.

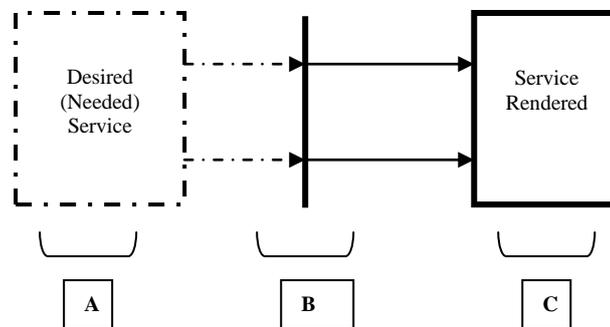


Figure 2. 2: ‘Simple-Constituent Service’ (Source: Author)

For instance, a customer at point ‘A’ may desire to know if containers of interest have arrived in the port. He/she picks up the phone and dials the port’s customer service unit. ‘B’ represents an ‘interface’ where the customer makes the intended inquiries for the needed service. [Interfaces here symbolise stages at which there are interactions between two or more parties (internal or external) to enable progression unto the next level in the bid to render the necessary service]. As would be expected from the port, the follow-up response to the request in question will be to key in the customer’s details into the computer database to reveal the status of the customer’s containers. This leads to the next stage depicted by ‘C’, in which the customer’s container status is made known to him/her from the port’s inbound container database; hence the requested service becomes a rendered service. Simple-constituent services therefore, are those that tend to have less ‘interfaces’ from the point of request for service to the point of service receipt by the customer.

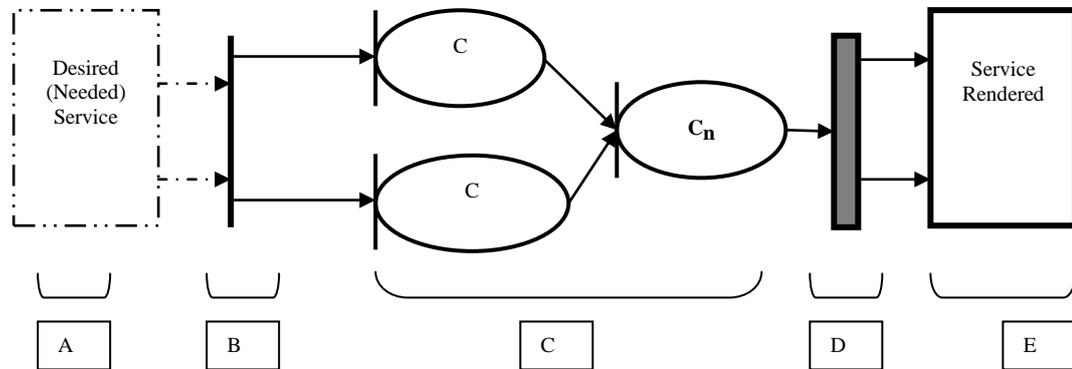


Figure 2. 3: ‘Multi-Constituent Service’ (Source: Author)

Figure 2.3, represents a ‘multi-constituent service’. At point ‘A’ a customer desires a particular service and expresses this need to the service-company at point ‘B’ (first customer-company interface). This kind of service would require the performance of various jobs and progression from one stage to the other, as illustrated by ‘C’. A good example would be port users applying for and going through the clearing process for an imported consignment.  $C_n$  shows that the number (n) of service-constituents (activities) to be performed could be more, depending on the nature and complexity of the service. At stage ‘D’ contact is re-established with the customer, while ‘E’ stands for the service rendered at the end. The different service-constituents utilises materials (elements) basically supplied from other sources, particularly from the production industries.

## 2.8 Value Added Concept and Value Adding Services

Recognising diverse opinions, an attempt is hereby made using figure 2.4 to illuminate the ‘value added concept’ and also the ‘value-adding service’ focus in this research project.

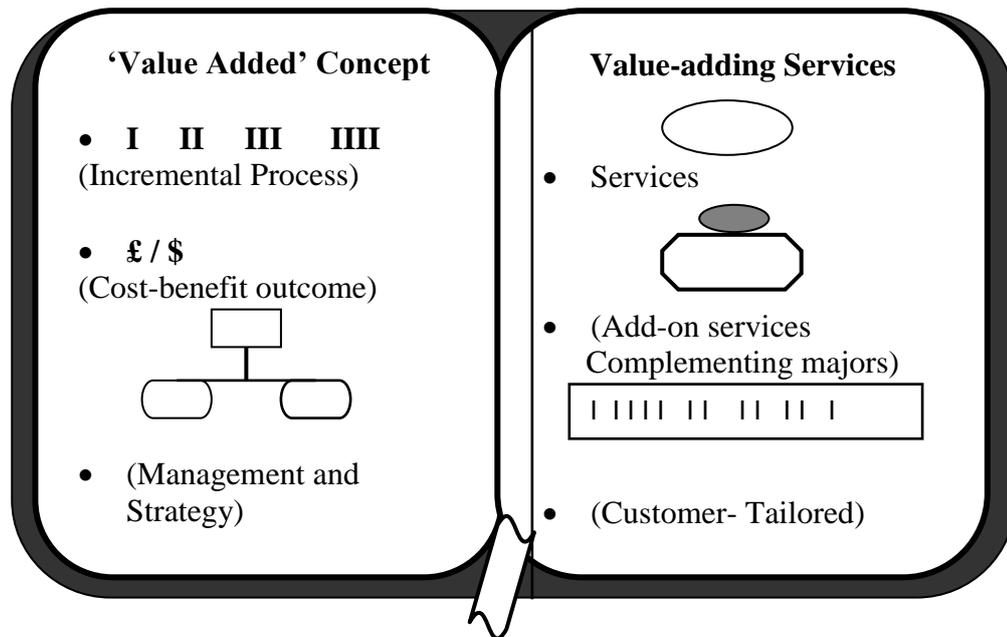


Figure 2. 4: Value Added Concept and Value-adding Services (Source: Author)

### 2.8.1 Value Added Concept

As illustrated on the left-hand side of figure 2.4, the first perspective of ‘value added’ concept is that of an incremental process. Implying that a sequence of progressive activities carried out to satisfy customers are viewed as value added (Christopher et al., 2002; Porter, 1986). To gain and build competitive advantage in creation of customers’ products, Porter (1986) held very strongly to the idea of value creation activities.

In a characteristic analogy of how businesses have employed capacities offered by shipping to transport goods and facilitate international trade, Stopford (2009) portrayed that ‘value added’ is a modern economic jargon that can be used in a context to convey that the lives of recipients of goods and those who benefit from global trade are made better. The connotation is that as an element (material or

function) of demand advances along the process to satisfy customers it acquires value. This view of 'value added' has a relationship with the constituents of 'service' as described in section 2.7.1.

The second aspect is the focus of 'value added' as concerned with the input and outcome of a particular business in relation to the cost, revenue or benefits as perceived by the customers (Wilson, 1979; Walter et al., 2002; Edvardsson and Olsson, 1996). Wood (1978) further stated that value added is a measure of output divided by inputs of manpower and capital to express performance per head: hence it is a profit on sales or return on capital/investment orientation (represented in figure 2.4 by the dollar and pound signs). Considering this, it can be observed that the perception of value added is therefore based on efficiency and effectiveness in resource utilisation.

The third point, depicted by 'organisation structure symbol', is a view of 'value added' as related to enhanced strategies, management styles, technologies, special projects or operations (Chernatony and Harris, 2000; Fletcher and Hardill, 1995). An activity or new innovation that makes an organisation thrive becomes value added to the business. For instance, Au and Ho (2002) viewed the use of technology to facilitate supply chains as value added; and Haezendonck et al., (2000) analysed the different perspectives of value added as a function of the value different ports ascribe to different category of cargoes and also projected the opinion that value added aims to measure the contribution of ports to the Gross Domestic Product (GDP) of a nation.

### **2.8.2 Value-Adding Services (VAS)**

On the right-hand side of figure 2.4, features that would aid the understanding of value-adding services (VAS) are pictorially represented. The first perspective is that when discussing VAS, attention is drawn to the idea that they are services. As John (1999) explained, the word service is essentially used to represent the offers of an industrial sector that does things, and not the making of things. Consequently, an integral aspect of VAS is about doing things or offering of some kind of activities to customers rather than the total creation of tangible products.

The second feature of value-adding services is concerned with being conveyed as additional services, which complement the majors'. There are generic, standard or basic services for which firms are in relationship with customers; however value-adding services typically connote extra special services beyond the basics (Bowersox et al., 2007). They are therefore 'add-ons' (additional) services built into the major offers.

In line with this, the third facet of value-adding services idea as associated with the meter-rule symbol in figure 2.4 is that they are customer tailored. Value-adding services are unique activities tailored to specific needs of customers; representing extensions over and above a firm's basic services (Bowersox et al., 2007). Galetzka et al. (2006) also acknowledged the opinion that standard services do not basically constitute customer tailored specifications.

Logistics has since been in the frontiers of modern business, and most supply chains have become customer-driven (Ainsworth, 1992). The strength of the customer-driven concept has continually propelled expectations and demands for tailored or customised services by customers. Recognising the growing desire for value-adding services by customers, Christopher (2005) stated that rendering such tailored services to customers offers a competitive differentiation strategy.

In the realisation that value-adding services are tailored to meeting customers' needs, it therefore implies that often there will be a need for efforts to be joined together by firms and their customers in developing value-adding services. Edvardsson and Olsson (1996) are of the opinion that in the task of developing a new service, the following should be ensured: (a) Fulfilling the prerequisite needs of customers (b) Supporting customers to make their desires explicit (c) Understanding the customers' needs and (d) Incorporating customers in the process of service development. These steps are unequivocally important, because ensuring that the right quality is built-in from the very start is necessary even in the development and offering of value- adding services. Again, it is only when value-adding services are carefully developed that the intrinsic worth of their customised nature can be elicited. Based on this therefore, it would be expected that an organisation make earnest searches to get acquainted with the business needs of its customers, so as to render its services better.

## **2.9 Value Adding Services in Port Logistics**

In order to understand value-adding services in the context of the port, it is very important to have a sound grasp of what the port stands for in regards to its services. According to the 'Port Working Group of the Commission of European Communities', the seaport can be defined as an area of land and water made up of improvement works and equipment that principally permits the reception of ships, loading and unloading of vessels, storage and transfer of goods to inland transport, while being able to include the activities of businesses linked to sea transport (UNCTAD, 1993). It is put by Janson and Shneerson (1982) that there are about seven integral aspects of port processes, namely: approach; mooring and unmooring; loading and unloading by the quay; storage; transit; export and import.

These descriptions of ports clearly bring to light the traditional and core services for which ports, despite their present-day complexity and diversity, exist to offer to port users. The seaport is defined by Cullinane and Talley (2006) as a place that provides for the transfer of cargo and passengers to and from waterways and shores. These buttress the common perspective of ports being in business for transference services.

However, the widening problems of port logistics have propelled port authorities and other port-interest bodies into off-dock non-traditional activities (Heaver, 2006). The port is an integral component of the global supply chain, where the influence of customers has increasingly gained momentum leading to the proliferation of tailored/customised services by organisations to their customers. This reflects the widely acknowledged trend for logistics value-adding services. In agreement to the core port services as found in the definitions, value-adding services refer to those services which a port can develop for the benefit of port users, which are however not essentially the main or traditional services offered by the port.

In the port context therefore, trends in the global supply chain point towards a need, especially in the face of competition, for port management to understand the peculiar business needs of their customers and exploit the same to the port's advantage by offering value-adding services. However, a study carried out by Ugboma et al. (2004) suggested that value-adding services ranked low in the perception and expectation of

services by customers (port users) from different Nigerian ports. With this suggestion in view, it is believed that the extent to which port management has come to the realisation of the potentials of developing and deploying value-adding services in the formulation of port's strategies require further empirical investigation. This need for investigation is encouraged given that in a study on port performance measurement, Bichou and Gray (2004) indicated that the direction of a port to a strategy of value-adding logistics activities could be a beneficial approach to the port business. Additionally, the responsibility of ports surpasses just being the traditional water/land interface for ships and cargo services to include value-adding logistics. Over and above traditional services, Pettit and Beresford (2009) supported the idea that the provision of tailor-made services within a port has become fundamental to the overall effectiveness of the port within the supply chain.

These are all pointers to a view that value-adding services are activities to be taken seriously in the port business. In a way of supporting this inclination, Haezendonck and Notteboom (2002) advocated that in the 21<sup>st</sup> century's customer-led business arena, seaports with a sound understanding of customers' needs are most likely to succeed. In the same vein, Goss (1990) stated that rather than ports' marketing departments concentrating merely on selling of services, they could also be useful channels through which the views of shippers and consignees (port users) can be communicated to the port management.

Song and Lee (2009) reiterated that the increasingly evolving demands of end users of maritime transport, is one of the reasons that have led to the growth of maritime logistics bringing up issues that require further elaboration and debate. Efforts toward understanding customers' needs and becoming more end-user/customer-oriented would promote service customisations which are in turn considered as value-adding services.

In reporting the Herculean competitive tussle between Busan (Korea) and Shanghai (China) ports for cargoes originating from the northern part of China, one of the suggestions of Anderson et al. (2008) is that Busan's new strategic port (Yangshan) may concentrate on cargoes requiring value-adding services, given that the services can be more quickly provided in its hinterland park. Though investment in port infrastructure was the major competitive issue considered in the report, their

proposition goes to indicate that there may be certain cargoes that might require more value-adding services than others.

Again, there are also pointers to the need for good expanse of land and the development of certain facilities to facilitate the offering of value-adding services (Mangan et al., 2008). The need for value-adding services as a strategy for differentiation is growing in potential, not only in the port industry, but also in the entire maritime sector. As the global alliances between shipping lines increases, individual ship operators will also continue to seek a means to differentiate their products from other lines, even from their alliance partners, by the offering of value-adding services (Martin and Thomas, 2001).

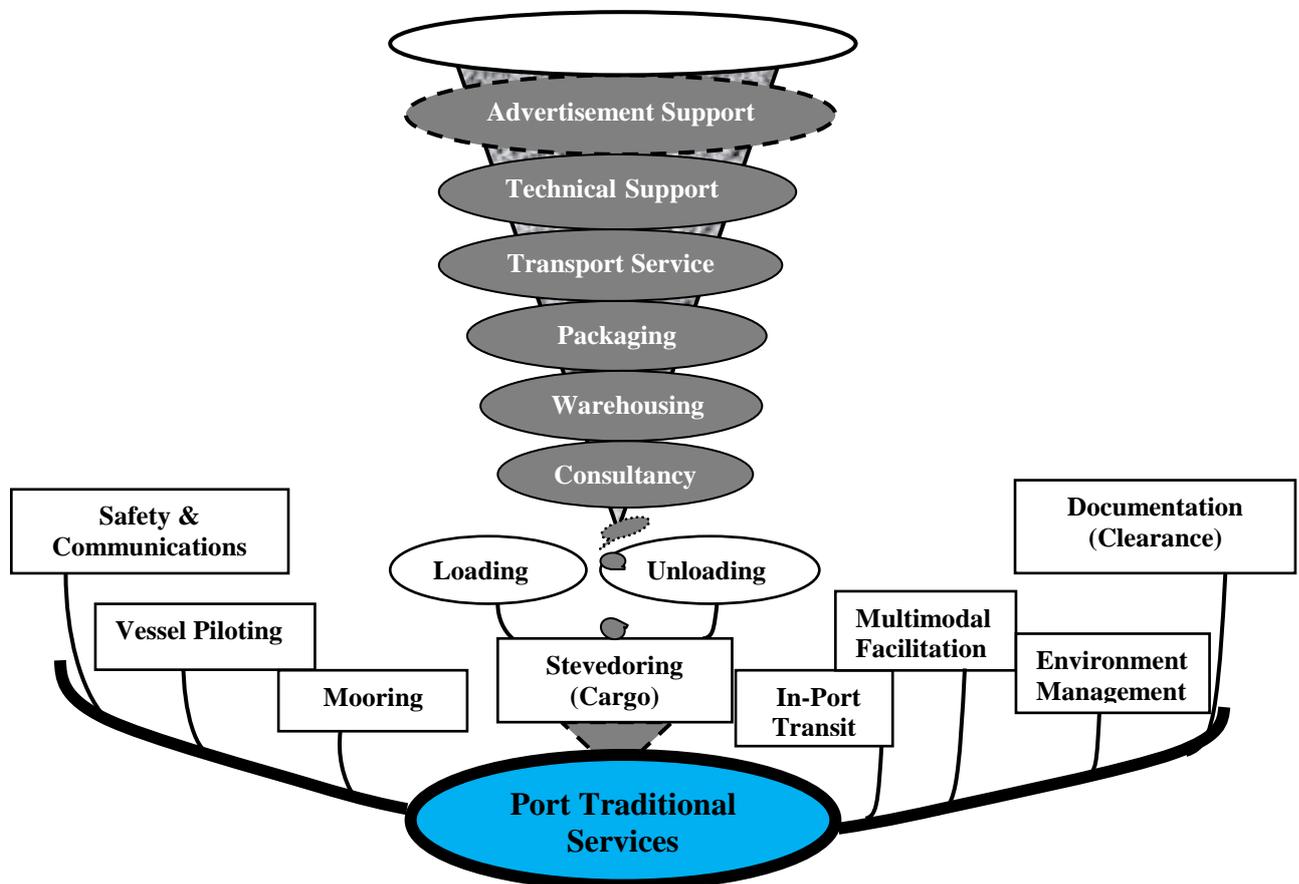


Figure 2.5: Port value-adding services theoretical model (Source: Author)

In figure 2.5 above, a model of port value-adding services is presented. The model is founded on findings from the literature and industry experience on the core, traditional and fundamental services which a typical port would provide. “A model is a simplified but organised and meaningful representation of an actual system or process” (Zaltman, 1977, cited in Worcester and Downham, 1986; pp. 574).

Similarly, the port VAS theoretical model is a representation of value-adding services and core port services which are explained as follows:

- (1) Safety: Undeniably, safety in ports is mandatory under laws of different nations and the international community's conventions. By the adoption of the Geneva Convention in 1948, the United Nations established the International Maritime Organisation (IMO) with one of its early and primary objectives being safety in shipping. Since ports are integral nodes in global shipping, some of the International Maritime Organisation's conventions and regulations on safety are binding on ports. For example the PSC's (Port State Control) obligations of destination ports. Ensuring safety therefore encompasses different areas like safety mapping, development and maintenance of safety gadgets, dissemination of real time information to port users on both the water and land sides.
- (2) Vessel Piloting: From the water-side of the port, as vessels call in, the necessity to safely navigate ships to the dock becomes even more important. Given on the one hand that navigation in water areas of close proximity to ports requires a sound understanding of the local or territorial waters, and on the other hand that most crew of calling vessels might not have this knowledge, offering of piloting services has since graduated to being a necessary statutory function of ports around the world. Consequently, ports employ and train staff, usually designated as Captains, who have a comprehensive knowledge of the port's waterways and competent nautical skills to safely navigate different sizes of vessels into and out of the port on return journeys.
- (3) Mooring of Vessels: The service of safely docking or berthing a vessel and then fastening it in place is associated with the term 'mooring'. Specialists in this area in virtually all ports are readily available for the offering of mooring services to incoming ships.
- (4) Stevedoring: Having accomplished the mooring and berthing of the ships, stevedoring operations follows. Principally, there are two sides of stevedoring operations. One is concerned with the unloading or discharging of cargoes from vessels, while the other is the loading and stowing of cargoes from the landside into the holds of berthed vessels.

- (5) In-port Transit: When materials and goods bound for transshipment or export enter into the port, they go through a series of within-the-port transportation which finally bring the goods to the quay ready for the water/sea-leg movement. On the other hand, cargoes received from the seaside onto the quay are moved within the port, from the quays to the transit sheds, and as the clearance procedure is completed, the cargoes are moved out of the port. All sorts of goods or cargoes movements within the port are commonly referred to as in-port transit and have fundamentally become necessary and basic port services.
- (6) Inter-modal Facilitation: Though this phenomenon has increasingly become the case in contemporary times, ports have historically been points of convergence for different modes of transport. Therefore ports traditionally serve to facilitate the transference of goods in the transport chain from marine vessels onto land-based transport units like trucks, vans, cars; and as is obtainable nowadays, onto rail or air transport means.
- (7) Environment Stewardship: The responsibility of ports as environmental stewards and guardians has since become increasingly pronounced. For example the coming into force of IMO's MARPOL regulations in the 1970s to combat marine pollution was aimed at the protection of the marine environment. Thus, ensuring that ships meet set standards has remained core duties of flag of states and port state control authorities.
- (8) Documentation: Ensuring that users of ports undergo legitimate procedure or have previously undergone necessary processes is the primary purpose of port management's documentation service. Documentation remains one of the orthodox services of the port that has remained a challenge given the unique environment of port's operation and also its importance in influencing national and international trade and transportation standards.

### **2.9.1 'Value Drops'**

The core/traditional services of ports having provided the fundamental platform on which a typical port operates its business, the model (figure 2.5) depicts 'value drops' from value-adding services onto the core port services. Reinforcing the understanding that logistics value-adding services as discussed in the context of this research are

actually complementary and unique/customised services above and beyond the traditional services offered to port users in the port.

From the ‘value drop’ end of the model, the value-adding services represented include: warehousing, packaging, technical expertise support and delivery (transport). Next in the strata of ‘value drops’ section is the advertisement support, having a dotted cycle different from those of other services. This difference suggests a special attention this research gives to the service by proposing that advertisement support might have potential in solving challenges of marketing port users’ products and services created by smuggling. Refer to section 6.6.5 (e)\* for further discussion.

Finally, since there is no shortlist of services that can be categorised as value-adding services, the top ‘empty’ cycle in the model represents and presents the opportunity to add more value-adding services onto the model. This represents opportunity for more academic researchers and industry practitioners to develop more innovative and customised value-adding services.

## **2.10 Summary**

In this chapter a distinction has been made between value-adding services and other perspectives of ‘value added’ concepts. While some of the main perspective of ‘value-added’ include incremental processes/activities, cost-benefit accruals of a business venture and management styles, value-adding services as in the context of this study are additional and customised services which complement the core- service offers.

Service is typically the offer of an industrial sector that does things (activities) rather than the making of things. Contribution is made in distinguishing services according to constituents into ‘simple’ and ‘multiple’ constituent services. The logistics customer-driven concept and the consequent intensification of competition between ports were identified as some of the reasons that have made understanding the potentials of value-adding services in the formulation of port strategy increasingly important. Whereas value-adding services in ports have been identified in the literature by some studies that largely gave attention to other port’s operations, given divergent views on the services, the need to particularly examine the potential of value-adding services in port’s strategy becomes even more compelling.

## **Chapter 3 - Research Methodology**

### **3.1 Introduction**

This chapter concentrates on understanding and presenting research methodology relevant to this research project. The various perspectives and processes of the research shall be sequentially reported. Discussion of the techniques deployed for the collection of research data in the study is presented; these include questionnaires, interviews and a search of ports' databases.

Firstly, the philosophy and approaches taken in this research will be explained. In this light, the ontological and epistemological perspectives of the study will be discussed in order to set out the research paradigm.

Secondly, the research strategy deployed based on the aims and objectives in this study will be discussed. Areas to be covered include research aims and their methods of achievement. This also introduces how primary and secondary sources of data will enable achieving set research aims.

The chapter introduces the use of multiple case studies research, which will be covered in detail in chapter four, dedicated for case study ports. Finally, there will be discussion on the gathering of reliable primary research data. Thus, other areas covered include the processes and steps taken in gathering data by questionnaires and interview methods.

## **3.2 Philosophy and Approaches to Research**

Research philosophy has to do with assumptions and perspectives about the development of knowledge, thus allowing the identification and comprehension of the logic of inquiry while providing the ‘rules’ and ways of building knowledge of the world (Maylor and Blackmon, 2005; Saunders et al., 2007). The philosophy explains theory in doing research in a given field and describes the underlying assumptions of approaches to research.

Assumptions are made in research concerning the nature of reality and how to understand reality. There are two major broad philosophies, **ontology and epistemology**, that are worthy of note in order to better comprehend research philosophy. The two ideas of ontology and epistemology are differentiated as ‘the theory of being’ and ‘the theory of knowledge’ respectively.

### **3.2.1 Ontology**

This is concerned with accepted assumptions that underpin reality in a particular research area. Therefore, the research philosophy in a particular a piece of research defines the ontological assumptions, which are basically about what is accepted or considered to exist or be real in a study area. While the objectivist ontology, for example, is appropriate in research on physically real objects, subjectivist ontology (constructed assumptions) is more appropriate for studying many business and management phenomena, given that human behaviours differ significantly from natural objects (Maylor and Blackmon, 2005).

### **3.2.2 Epistemology**

The term epistemology is concerned with what is/is not considered as knowledge in a particular area of study. It describes some fundamental assumptions, which have to be followed consistently in research to develop knowledge. For instance, while the opinions of persons furnish a social researcher with acceptable and useful data in a study, a natural scientist would rather prefer objective data or evidence from nature. In the literature, there are essentially two extreme and dominating epistemological views about the ways in which knowledge can be developed: **positivism and subjectivism**.

Positivism in research philosophy advocates an **objective** view that people’s beliefs have no significance on the facts or reality world. Alternatively, **objectivism** is an ontological viewpoint that asserts that the social phenomena exist independent of the social actors (Bryman and Bell, 2007). However, pure **subjectivism** ontology suggests that there exists no reality that is independent of the perceptions of people. The subjectivist epistemology therefore, perceives knowledge as being reality or in existence if it can be experienced by human beings.

This pair of research philosophical views (objectivism and subjectivism) is on two opposite points, and at about the middle of this pair is another view to research known as critical realism. See figure 3.2 for clarifications of the differences and similarities of these views.

**Critical realism** is founded on acknowledging the natural science view that there exists a mind-independent and objective approach to understanding reality, however given imperfections, it also recognises that cognition and human perception play important roles in ascertaining reality (Lee and Lings, 2008; Wikgren, 2005).

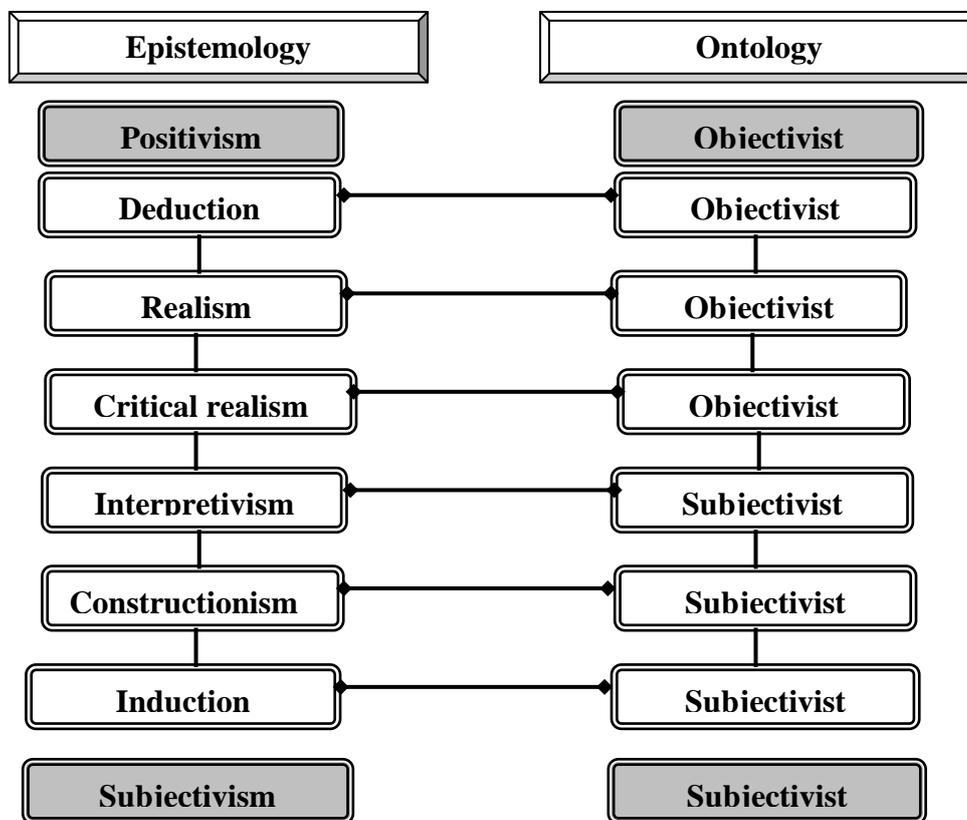


Figure 3. 1: Research Philosophy [Clarifying Ontological and Epistemological views] (Source: Author)

Figure 3.1 is used to illustrate various aspects of research approaches based on their epistemological and ontological standpoints which are further discussed as follows:

**Deduction:** Though predominantly used in natural science, deduction is also deployed in business and social sciences. Laws provide foundation for explanation and prediction of phenomena in deduction. Deduction essentially commences by proposing and testing a hypothesis (proposition), by experiments or other empirical methods, and then the results are examined so as to contribute to or impact on theory (Robinson, 1993). Deductive approach essentially uses quantitative data in its research methodology.

**Induction:** This approach seeks to form theory by understanding or making sense of the data collected on issues being investigated. Induction gives flexibility that allows the discovering of other issues of importance to the problem, rather than the limitation of other explanation, as is the case in the deductive approach that tends to deploy a rigid methodology construct based on proposition (hypothesis).

**Realism:** While recognising positivist belief, realism contends that reality might not be directly observable and measurable. ‘In other words, just because we can’t see something, doesn’t mean it does not exist’ (Lee and Lings, 2008; pg.31). It allows the postulation of unobservable entities (abstracts) in theory, which if related to observable effects by empirical observation, are considered to actually exist.

**Interpretivism:** By interpretivism, social scientists seek to gain access to people’s ‘common sense of thinking’ and thus interpret their actions in the social world point of view (Bryman and Bell, 2007). Its focus essentially revolves around acknowledging differences between human beings and objects (the subject of natural science), so as to delve into producing explanations for meanings people attribute to actions.

**Constructionism:** This is an ontological view that social phenomena in addition to being the product of social interactions are also in constant revision, being built-up continually (Bryman and Bell, 2007). Its epistemology (knowledge building pattern)

view is that social actors', e.g. researchers, own versions forms part of a specific version of social reality.

### 3.2.3 The Research Project Perspective

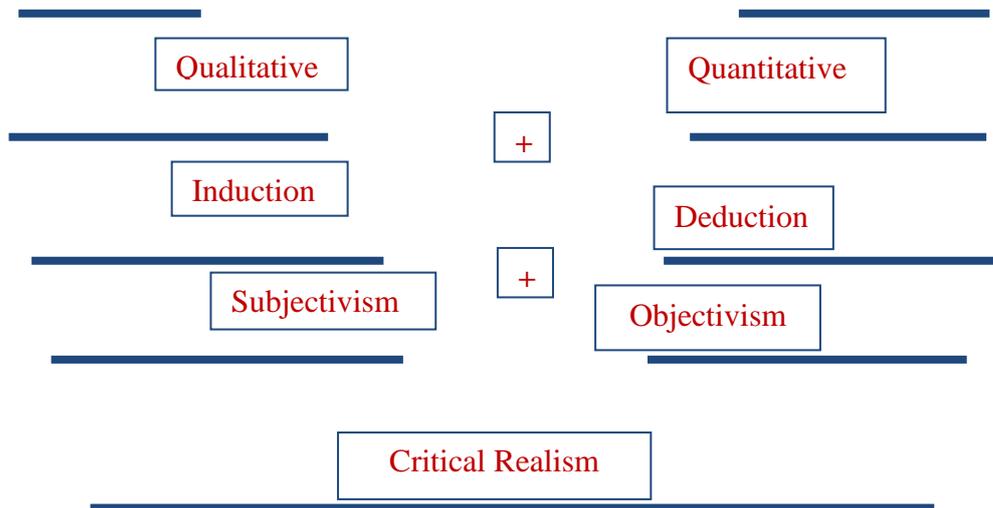


Figure 3. 2: The Research Perspective (Source: Author)

The perspective of this research is that of a critical realist approach to understanding reality. As illustrated in figure 3.2, a critical realist view implies that the research is founded on an objective platform, while also incorporating principles of subjectivism. This further translates to the integration of both quantitative and qualitative approaches to the research, enabling the employment of deductive and inductive contributions respectively.

Essentially, the critical realism perspective toward discovering knowledge is chosen in this research project after due considerations of other approaches, because it gives an opportunity to strike a necessary balance between objective and subjective views. As a result, both deductive and inductive strengths are robustly used, permitting mind-independent approach to comprehending reality while also infusing human experiences and perceptions, which have been considered by many scholars to be invaluable in the quest of unravelling reality in the social world.

### **3.2.4 Exploratory and Analytical Approaches**

The research process is both exploratory and analytical in nature, channelled particularly towards investigating the potential relationship between the dependent and independent variables as outlined in both proposition (see section 1.4).

The exploratory aspect is geared toward identifying and understanding the various facets and issues surrounding value-adding services as a topic and then, more importantly, the extent to which this subject area has been researched and implemented in the port strategy context.

On the other hand, the analytical part of the research is essentially a medium to empirically test developed propositions and build other models. In this vein, various variables under investigation will be analysed and therefore will contribute to understanding the tested propositions and other resultant outcomes. This further encompasses inferential and objective examination of various issues about the relationship between the deployment of value-adding services in a port's strategy formulation and the competitive advantage of attracting and retaining more port users.

### 3.2.5 Research Strategy

Drawing from the research perspective in section 1.3, the aims and objectives formed the basis of the research strategy deployed in this project. In this regard, table 3.1 shows the details of the research strategy, tailored towards achieving set research aims.

Table 3. 1: Research Strategy Outline

<b>Research Aims</b>	<b>Achievement Method</b>
1. To explore the knowledge and perspectives of value-adding services (VAS) concept.	Search to understand VAS in (a) Journals (b) Textbooks (c) Websites/Databases (d) Other relevant publications.
2. To investigate and analyse how VAS are carried out in ports of developing and developed economies.	(a) Field survey of port users in case study ports to obtain data; (b) Analyse VAS rates, impacts, characteristics in the case study ports.
3. To examine and evaluate the influences on port users' selection of ports.	(a) Study the details of port selection criteria in the literature. (b) Gathering the views of port users via questionnaires on port preferences. (c) Analyse and interpret data from field survey.
4. To assess the suitability of value-adding services as a means for port's competitiveness.	(a) Literature review of VAS in port context. (b) Survey port users by questionnaires (c) Interview with port management on the deployment of VAS.
5. To evaluate decision-factors for Port Management in strategy formulation.	(a) Critical assessment of factors in publications that impact on port strategy (b) Engage in in-depth interviews with Ports' Management.
6. To draw adequate inferences from facts and research data, and proffer models to facilitate understanding and deployment of VAS in ports.	(a) Appraise literature review, questionnaire and interview data. (b) Make deductions based on informed details of findings (c) Develop VAS port models based on research data

Research strategy guides the research design, which in turn provides a framework or plan for the collection and analysis of data from the real world to explore and test postulated theories (Lee and Lings, 2008; Bryman and Bell, 2007).

In real life situations, investigative opportunities, research areas, resources and objectives are more often not the same, hence there are a number of issues to consider while making the decision on which research methods to use. Data are only as good as the instruments by which they are collected, therefore, there is need to be meticulous while designing the research data collection methods.

### **3.3 Research Primary Data**

As earlier indicated the major means of gathering primary data in this research is by the use of questionnaires, interviews and case studies. Questionnaires and interview schedules were developed, validated and piloted before using them to gather data through field surveys and interviews. This section is principally focused on explaining the questions and issues contained in the questionnaire and interview schedule for data gathering, and then to expound the intended analysis techniques and their goals in the research. See appendices 1 and 2 for the samples of questionnaires and interview checklist used in gathering data.

#### **3.3.1 Multiple Case Studies Research Method**

Case studies give focus on an example(s) of a subject of discussion in order to have an in-depth insight. Zikmund and Babin (2007) described case studies as concerned with documented history of a particular person, group, organisation or event, which are examined and analysed based on important themes. In any case, a more compassing view was stated by Cousin (2005) that case study research aims to explore and depict a setting (subject) with a view to advancing understanding of it. The use of case studies in research involves intensive examination of a few selected cases of the phenomenon of interest (Malhotra, 2010). Case study research may take single or multiple case study forms and may include qualitative and quantitative approaches (Bruns 1989; Yin, 2009). Multiple case studies were used in this study in order to broaden the understanding of value-adding services and produce in-depth comprehension of the subject. Cousin (2005) used the term ‘collective case study’ to describe an approach where the researcher chooses more than one case in order to achieve some kind of representation. The case study is an approach to research with the capacity to enable the gathering of data from multiple levels and multiple organisations (Cameron and

Price, 2009). Another characteristic of case study research is that it offers the opportunity to systematically aggregate research data in order to reach reliable results (Yin and Heald, 1975). In this manner, the use of multiple case study approach gives an opportunity for in-depth exploration of research issues, so as to lead to better knowledge and provide basis for future research (Carrier et al., 2004).

### **3.3.2 The Choice of Questionnaire Technique**

Sampling the opinions of port users is a fundamental aspect of this study. This is in order to investigate if the rendering of value-adding services in a port could form sufficient reason for port users to use a particular port instead of another.

After an objective evaluation of other methods of data collection, the questionnaire method was chosen mainly because it offered good and flexible characteristics that would enable the polling of port users' opinions, which in turn would support meeting the research aims and objectives. Thus, the use of questionnaire offered a simple and yet versatile means of obtaining data from port users.

### **3.3.3 Collection of Data by Questionnaire**

Questionnaires are known for their versatility. As explained by Saunders et al. (2007), collection of data by questionnaires can generally be sub-grouped as follows:

1. Self-administered Questionnaire: Postal questionnaires; Internet-mediated questionnaires; Delivery and collection questionnaires.
2. Interviewer-administered: Questionnaires Structured Interview; Telephone questionnaire.

#### **3.3.3a Questionnaire Design**

The following issues were taken into consideration while designing the questionnaire.

- Brevity, wording and appearance; resulting in a total of 18 final questions.
- Categorisation of questions: In designing the questions and opinion options in the questionnaire, measures were taken in order not to push 'forced answers'

on respondents. For example, the ‘not sure’ answer option was included in certain questions to ensure that respondents give answers willingly and assuredly. The questions include dichotomous, open-ended and multiple-choice questions.

- Analysis method: Analysis of the expected data was also taken into consideration at this research design stage. The open-ended questions were included to provide opportunities for respondents to include relevant information, which would assist to further understand the issues of concern as outlined by the aims in section 1.3.2 and to correctly interpret respondents’ opinions.

### **3.3.3b Questionnaire Questions**

The questions in the semi-structured questionnaire were constructed based on findings from the literature review which are relevant to the research aims and objectives. This formed one of the means of the research triangulation. The questions include:

#### **Section A: Pre-Information**

Section A is intended to obtain general information about the respondents (port users). Refer to appendix 1 (page 223) for details of questions in the questionnaire. The questions and their goals are set out as:

Question 1: This was to explore the different business specialisation areas of the respondents in port services.

Question 2: Respondents job titles or positions, as obtained from this question enabled the researcher to have a good knowledge of the hierarchy of the persons from whom data were gathered.

Question 3: By this question, data were gathered on the respondents’ years of experience in port business.

Question 4: Data on the various training and education levels of the respondents were gathered by this question. This might be a pointer of what to expect in the way responses were made by different respondents, especially in regards to quality.

While designed to be anonymous, section A of the questionnaire was used to gather general identity data of port users in the ports. The quest to understand value-adding services and port logistics will definitely not be complete without a comprehensive identification of the active players in the port industry.

### **Section B: Features of Port Services**

As the literature showed, value-adding services in the context of this study are non-core services in the port system. Hence this section was designed to explore and understand the contemporary trends of different kinds of services offered in ports. Having observed divergent views from use of terminologies on ‘value added’ (Wilson, 1979; Walter et al, 2002; Christopher et al 2002; Chernatony and Harris, 2000) and ‘value-adding-services (Bowersox et al., 2007; Christopher, 2005), attention was given in section B to ensure that the perspective of value-adding services being investigated in this research project was clearly presented to the respondents (port users). Hence, value-adding service was defined, and then followed by questions as explained below:

Question 5: This was to ascertain the availability or absence of value-adding services. It also enabled an understanding of the types of value-adding services obtainable in the ports.

Question 6: Through this question, key value-adding services as identified in the literature were put forward, seeking to know the likelihood of customers (port users) using the services if they were to be made available in the ports.

Question 7: This question was set out to provide an opportunity for respondents to comment particularly on the availability of key value-adding services in the ports. From a strategy perspective, there is an inherent implication of the availability or non-availability of value-adding services in the ports.

### **Section C: Features of port users' patronage**

This section seeks the opinions of port users on the impacts of rendering or offering value-adding services in ports. It is set in a manner to draw clear information about the relevance of value-adding services to the businesses of port users, and therefore will provide a platform to understand the extent to which such services, if at all, can be incorporated into port strategy. It is the objective of section C to gather port preferences data.

Question 8: The statement “port users would prefer a port that renders value-adding services (VAS)” was put forward and the reactions of respondents in this regard were collated.

Question 9: For further investigation on the impact of value-adding services in ports, data were obtained through this question on whether the availability of such services would make a port more or less attractive to port users.

Question 10: As the research project also covers investigations of the capability of value-adding services to retain port users, data were gathered from respondents by this question, to understand if the services are able to make them continue using a particular port.

Basically, questions in section C were designed in a way to gather data that would be used in running various statistical tests related to the propositions set out in this research.

### **Section D: Awareness of Value-adding Services (VAS)**

Question 11: Data from this question gave the opportunity to assess port users' awareness of value-adding services in the context of this research.

### **Section E: Rating of Value-Adding Services (VAS)**

Question 12: Ranking of some of the key value-adding services as identified from the literature, according to importance, was made possible by data from this question. The goal was to support analysis and knowledge of how important some value-adding services are to port users in ports of developing and developed economies.

Question 13: By this question, port users were asked to give ratings to the extent of offering value-adding services in the ports. While the question assisted in evaluating

the extent of value-adding services offered in the case study ports in developing and developed economies, it also enabled the assessment of gathered data's reliability as discussed in section 5.8.

Question 14: Given the diversity of value-adding services, this question gave an opportunity for port users to make known any particular value-adding services which they would like to be available in the ports. Data from this question shall support meeting research aim 1, as outlined in section 1.3.2.

### **Section F: Criteria for Choice of Port**

Question 15: This question sought to draw data on port users' opinions on the processes necessary to develop value-adding services in ports.

Question 16: While the focus of this research project is on value-adding services, there are many other core criteria that influence port users' selection of port. This question therefore was set out for port users to evaluate some of the criteria that influence their selection of ports.

Question 17: This question particularly inquired about port users' awareness of advertisement support service in ports. There is a particular inclination of advertisement support service postulated in this study and data obtained from this question will furnish increased understanding of the proposition.

Question 18: Some respondents might have other related issues to discuss. This question provided that opportunity for general comments and discussions.

### **3.4 Sample Size**

The determination of a sample's size can be done by the calculation or rule of thumb methods. Given the clarity that data would only be drawn from established port-user companies, the rule of thumb method was used and decision made that selecting sixty (60) port-user companies from each of the case-study ports, would form a substantial representative sample of port users in the ports. In this light, lists of accredited port users as published on the brochures and other databases of the four case-study ports were obtained and used for the survey.

In a way of substantiating the sample size, it is pertinent to point out that scholars in the area of research statistics suggests a minimum of thirty (30) entities as sample size for a rule of thumb method to ensure a fairly distributed statistical analysis (Stutely 2003; Saunders et al, 2007). With this in view, it is therefore necessary to observe that for this research project there was a 100% increase in the required minimum, bringing the sample size to a total of sixty (60) accredited port-user companies in each case-study port.

As a result, one hundred and twenty (120) port-user companies were selected in ports situated in developing economies, and for ports in developed economies, another one hundred and twenty (120) port-user companies were selected. On the whole therefore, a total of two hundred and forty (240) port-user companies made up the sample size from the four case study ports. The process of this selection will consequently be reported.

Rule of thumb method in regards to determining the size of a sample is concerned with the use of judgement in ascertaining the appropriate sample size. In agreement with the views of Saunders et al. (2007), some of the issues put into consideration in this research project while using the rule of thumb judgement method to decide on the size of the sample include:

- The level of confidence needed in data as being representative of the population: It is expedient to observe that because this research is about strategy, data were drawn from managers and senior officers of only established and accredited port-user companies. On this basis, there is high confidence in the source of data, which balances with the high level of confidence needed to meet research aims. Consequently, there is a commensurate high expectation that data drawn adequately represent the population of port-user companies.
- Error-tolerant limits: In most experiments as is the case in natural and social science research, standards are set as to the limits errors can be tolerated in the analysis of data. Higher precision is required for certain research than is the case for others. It would therefore be logical to be of the mindset that in research of this kind the larger the sample size, then the lower the data drawn for analysis would be prone to errors.

### 3.5 Probability/Randomised Sampling

As a matter of necessity, it is imperative at this juncture to point out that social science research since 1945 has found random sampling to be very useful. McDonald and King (1996, pg 78) supported this particular view, reiterating that *'according to Moss, random sampling or probability sampling was used on almost all work done by social survey from 1949 onwards. Random sampling is theoretically preferable to other methods because it is based on known probabilities of selection, and has an obvious appeal when the main requirement is to describe the population accurately; as Moser and Kalton put it: although skilful quota sampling can succeed in practice, it is not suitable for survey in which it is important that results are derived from theoretically safe methods. Only random sampling fulfils this requirement'*

The described sampling types, referred to as probability or randomised sampling have increasingly been deployed in contemporary research. Among sampling methods available, the most preferred and widely used approach is randomised probability sampling (Aaker et al., 2001; Chisnall, 2001). By way of elaboration, the different methods of probability sampling are presented below:

- Cluster sampling: Works in a manner that a population is divided into subgroups, then a random sample of the subgroups is chosen to form the sample included in the study. In this type of sampling not all the subgroups are included in the final sample size but only the members of selected subgroups. Cluster sampling is particularly useful where the population under survey is widely dispersed and simple random sampling being impracticable (Chisnall, 2001). Such dispersion of population does not however exist in this present research.
- Systematic or Quasi-random Sampling: This technique proceeds in a manner that the sample is formed by first drawing a member of the population and then continuing by subsequently picking every  $n^{\text{th}}$  member until the sample size is reached. It is systematic and quasi in nature because it entails obtaining the  $n^{\text{th}}$  interval by calculation of the ratio 'population: sample size'.

For instance if population = 2000 and sample size = 300, then the integer value of  $2000 \div 300 = 7$ , becomes  $n^{\text{th}}$  the interval at which members of the

sample must be picked from the population. In this form of uniqueness and strength, it is pertinent to observe that the systematic sampling method has a downside in that it might produce sample members that are almost identical (Schmidt and Hollensen, 2006), hence creating a situation where the population might not be fully represented in certain circumstance.

- Stratified Sampling: The population under investigation for this type of sampling is divided into groups or strata of similar attributes. Selection is then made for the sample either by random or systematic methods of choosing from the groups. The stratified method is usually used when there are large variations in the population, and groups or strata are considered to be more homogenous than is the case in the total population. There is thus an expectation of this process contributing to the accuracy of the sample in being a true representative.
- Simple random sampling is chosen for this research:

### **3.5.1 Choice of Simple Random Sampling**

Simple random sampling being a fundamental form of probability sampling does offer all members of a population a known and equal chance of being selected, hence guaranteeing that the resultant sample, no matter the size would be a valid representation of the population (Schmidt and Hollensen, 2006).

For this research, the simple random sampling technique was used, particularly as outlined by Bryman and Bell (2007). This method of sampling was chosen over other probability sampling methods (e.g. cluster, systematic, stratified) and non-probability sampling (e.g. convenience, judgement, and quota) techniques because of its simplicity and potential to minimise human bias.

It could be argued that stratified random sampling would have been a better option, so as to reduce sampling errors, being a more effective method for a population of high variation (Chisnall, 2001). In the case of the sampled port users population however, industry experience, literature review and later outcomes of data showed that there was no real variation in the population as in the circumstances where stratification method would be strongly recommended. This statement stands true also in the

understanding that a considerable number of port-user companies would at the same time have multi-faceted areas of operation. For instance, a particular port-user company might be involved in different functions as a shipping line company, freight forwarder, export and import agents.

As such the need for stratification because of very high variations in the population does not exist for the present research and according to Chisnall (2001) and Schmidt and Hollensen (2006) stratified random sampling, which is essentially an enhanced simple random sampling, is necessitated if pre-knowledge of the population reveals possible wide variations. Additionally, in some stratification sampling methods, such as the inversely proportional stratified sampling as in Aaker et al. (2001), particular groups are given more chance of being included in the sample than others based on a researcher's informed decision.

The focus of this research however, is to enable all port users to contribute to the final research outcome. Hence, giving an equal contribution opportunity to all port users in the case study ports' population was deemed important. This is because the demand for value-adding services can potentially arise from any port user, thus there should be an equal opportunity for inclusion into the sample. Having ensured that the population is composed of only established port-user companies on the accredited port list; the simple random sampling method offered a valid and straight forward method of reaching a representative sample of all port users.

### **Simple Random Sampling Exercise of Port Users**

For each case study port (Rotterdam, PD Teesport, Damietta and Apapa), the following steps were taken to randomly select port-user companies to be included in the sample size:

- (1) In order to ensure that those included in the sample were only established port users, the list of accredited port users was obtained from websites, recent publications and brochures of the ports.
- (2) The port users (in 1 above) were then all numbered (i.e., 1, 2, 3, 4.. etc), being over one hundred (100) for each case study port.

Having decided that the sample size would be a total of sixty (60) port-user companies, a table of random numbers obtained from Cooper and Schindler (2006, pg 681), was used to randomly select port users.

The manner of this selection exercise was that by cross-checking the random numbers on the table together with the numbered list of port users in step 2 above, port users with numbers tallying with those on the random number table were chosen until a total of sixty (60) port users was reached for each case study port. As a result, the entire sample size for all ports under investigation was made up of two hundred and forty (240) established port-user companies. See sections (5.7) for details on response rate analysis.

### **3.6 Questionnaire Administration**

Having gone through the questionnaire development stage and determination of the sample size as reported in sections 3.3.3 and 3.4 respectively, there followed the administration of the questionnaires for field survey.

A multi-method of questionnaire administration was adopted chiefly because of geographical and structural issues in the different case study ports. Processes taken:

- The questionnaires were posted to the respondents. This mail approach was chosen because the questionnaires were to be administered in dispersed locations. Questionnaire field surveyors also supported the distribution and collection of completed questionnaires from port users in ports in the developing economies. Administration of questionnaires by e-mails or electronic means was not carried out in the developing economies ports because of the inherent infrastructural difficulty and internet accessibility challenges.
- For port users in developed economies' ports, where internet and e-mail systems are well established, use was made of an electronic version of the questionnaires, which were sent to designated port-user companies' personnel by e-mail.

- Telephone questionnaire survey method was another means used in order to increase the response rate.
- To facilitate responses and collection of data, telephone-calls, contact-persons, e-mails and prepaid return envelopes were used to encourage responses from the respondents.
- For further details about response rate, refer to section 5.7.

It is important to note that researchers are able to creatively develop and use a combination of survey methods in a particular research in a manner that the methods in question complementarily strengthens and compensates each other's weaknesses (Malhotra, 1999).

### **3.7 Collection of Data by Interviews**

Interviews in this research were necessitated by the need to have a worthwhile supplementary source of data and also basis to meeting some of the stated research aims. Given that the research perspective is on strategy, this method enabled the interviewing of port policy makers. Essentially, most of the interviews were carried out prior the survey of port users by questionnaire. In this sequence, information from interviews supported the development of survey questionnaires.

Interviews are purposeful dialogue between two or more people on a particular topic of interest, to understand the views of the people involved. Interviews in research projects have for a long time ago been indicated by Kahn and Cannell (1957) to be a resourceful means of gathering valid and reliable data.

#### **3.7.1 The Choice of Interview Method and Interviewing Process**

The interview method used in this research was that of semi-structured interviews, which gives a greater flexibility than the structured type by using a variety of questions. Other interview methods include: unstructured approach, which allows interviewees to freely talk on a topic (Healey and Rawlinson, 1994). In structured interview, predetermined and standardised set of questions are used, having a systematic approach to recording responses.

Interview guidelines which have since being validated by Rogers (1976) for successful interview were followed, as recently supported by Bryman and Bell (2007). In this manner, interviewees received e-mails and/or phone calls well in advance explaining the purpose of the interview and asking for their cooperation. Given mutual convenience, particularly those of the interviewees; telephone and face-face interviews were carried out. Further details and discussions of interview data collection and analysis will be presented in section 7.2.

The interview checklist was precisely developed, resulting in only ten questions, while covering all required areas for drawing necessary data. During the interviews, adequate level of formality was ensured while maintaining courtesy and keeping the processes interesting. Data gathered were immediately transcribed in preparation for analyses and not entrusted entirely to memory for latter recall.

In a bid to free the interviews from bias, thus strengthening reliability and validity of data, in addition to the above, attention was given to create the needed conducive environment for:

- Trust/confidentiality
- Sound understanding of questions
- Interviewees' freedom of expression
- Avoidance of unnecessary questions
- Time management
- There was an accurate recording of all dialogue

Also, prior to the commencement of the interviews, the exact telephone numbers, times or venues to be used were agreed upon and confirmed. Interviews took place during the interviewees' chosen time. These helped to ensure the establishment of credibility needed for successful interviews.

### 3.7.2 Gathering Data by Interviews

Interview questions were designed to meet research aims 4 and 5 (see section 1.3.2) and gather data from port management by in-depth discussion and cross-examination of relevant issues. Given that some questions in the interview schedule were also in the questionnaire, only the questions that are particularly concerned with port management shall be explained below:

Reference should be made to appendix 2 for details of the interview checklist.

**Pre-information:** The pre-information questions were designed to understand the roles/positions and how long the port management personnel have been in port business.

Question 1: This question was to ascertain whether the port has got value-adding services. It will support the research aim 1, which is about exploring the different perspectives of what value-adding services stand for.

Question 2: Since no project can be carried out without resources, the reason for this question was to understand some of the various resources necessary for the offering of value-adding services by a port. Port management are in better position to give this information.

Question 3a/3b: Questions 3a and 3b were developed to understand the perceptions of port management in regards to the utilisation of value-adding services as strategy to attract and retain more port users.

Question 4: The aim of this question was to delve into further discussion so as to better understand the standpoint of port management on the issue of question 1. It encourages more explanation as to why particular ports develop and use value-adding services, where applicable.

Question 5: An inquiry on ports' strategic focus with regard to value-adding services was sought after by this question.

Question 6: This question gives a basis to explore the problems and challenges that ports could potentially encounter in the offering of value-adding services.

Question 10: Some outcomes from interview piloting necessitated the addition of this question to gather the views of port management as to which party drives the competitive strategy of a port in a landlord-port operator's structure.

### **3.8 Validity and Reliability of Primary Data**

All primary data collection methods in this study, both questionnaire and interview, were carefully validated and tested for reliability.

#### **Validity**

Validity is concerned with the integrity of conclusions drawn from data. It seeks to understand whether or not the resultant indicators from the data measure the concept they were actually designed to measure. For example, it was important during the questionnaire surveys and interviews that participants clearly understood that, value-adding services are additional or complementary services, as opposed to other concepts of 'value added'. By this clarity in definition, it is believed that the opinions of participants addressed the measure of concern (i.e value-adding services).

The panel of judges/experts' assessment is a way of ensuring that outcomes of investigations are valid (Broomell and Budescu, 2009). This method of content validation was used in this study. In this sense, research experts carried out a thorough evaluation of the questionnaire and interview checklist to ensure the integrity of the primary data collection instruments. The panel of judges method was chosen over others like concurrent, construct and predictive validation because of its detailed attention in ensuring the inclusion of necessary and valid variables.

#### **Reliability**

For reliability of data in this study, internal consistency evaluation was carried out on collected data. Reliability is concerned with the homogeneity of data measured and can be tested by inter-item consistency (Gulliksen, 1945) or the split half methods (Bryman and Bell, 2007). Another means for reliability evaluation can be through stability check (Dillon, et al. 1994); however that of inter-item internal consistency was used in this research. Refer to section 5.8 for the reliability assessment process as carried out on data gathered in this research project.

### **3.9 Summary**

While recognising the varieties of available research strategies, the critical realist approach to understanding reality was chosen in this particular study. This approach covers the integration of positivism and subjectivism means of conducting research. On this basis, the research methodology supported the gathering of data from the review of literature, questionnaires, interviews and port databases.

In this light, while in-depth interviews were carried out with port management, questionnaires were administered to sixty (60) port-user companies' managers selected by simple random sampling method in each case study port (i.e. total sample size being 240). The sample size, sampling and data gathering methods were all validated and supported by the literature. With these measures in place, there is a high expectation that generated research data will prove very reliable and suitable to meeting the set research aims.

## **Chapter 4 -The Case Study Ports**

### **4.1 Introduction**

The use of case studies in research is considered to be a veritable means of achieving research aims in empirical investigations (Yin and Heald, 1975; Gummesson, 2000). Single or multiple case studies can be used and may involve qualitative and quantitative approaches (Bruns 1989; Yin, 2009). This chapter therefore discusses the multiple case study ports used in this study, which are namely, Rotterdam port (The Netherlands), PD Teesport port (United Kingdom), Damietta port (Egypt) and Apapa port (Nigeria).

In the first instance, the reasons for the choice of the case study ports will be discussed. This will then be followed by giving focus to each of the chosen ports. The Rotterdam port shall be presented for discussion, and then followed by the PD Teesport port. In the same line, Damietta Port and Apapa port shall be discussed respectively. The essence of ensuring that investigations on the ports of the developed economies (Rotterdam and PD Teesport) are discussed first is to give reference and learning opportunities in the discussions of ports in developing economies.

Various aspects of the different ports' features shall be discussed. However, an attempt will be made in harmonising areas covered in all the case study ports. Areas covered for each of the case study ports include cargo operations, port projects, port ownership structure and value-adding services available in the ports.

### **4.2 Reasons for Choosing the Case Study Ports**

The reasons for the choice of these ports include:

- They are major ports in their countries and regions
- All the ports handle general and varied types of cargoes
- Accessibility to data, port users and port managers

While samples from the case studies might not necessarily be the same in all cases of the subject of value-adding services, however outcomes and inferences can support theory generalisation in similar contexts.

### 4.3 Port of Rotterdam Authority (The Netherlands)

The Port of Rotterdam Authority is a public limited company with complex facets of functions spanning the areas of managing, operating and developing of the Rotterdam port and its industrial area (Port of Rotterdam Authority, 2009a). In figure 4.1 the positions of European ports' classification and locations in relation to the port of Rotterdam is shown.

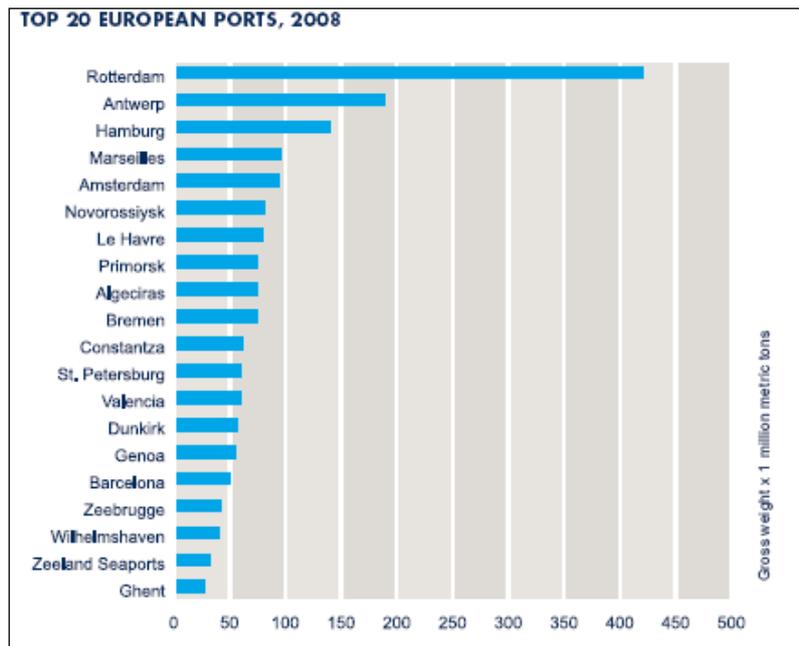


Figure 4.1: Rotterdam and European Ports (Source: Port of Rotterdam Authority, 2009b)

Primarily, the municipality of Rotterdam and the Dutch government are the two shareholders of the port of Rotterdam. While in gross terms, the Port of Rotterdam ranked 1<sup>st</sup> among the top 20 European ports, it is the 4<sup>th</sup> among world ports (Port of Rotterdam Authority, 2009a). In the area of container traffic, Cargo System (2009) reported that the Port of Rotterdam ranked 9<sup>th</sup> amongst the top container ports in the world.

It is important to point out that the grading of the European ports in figure 4.1 was based on gross tonnages handled in the ports. There was a 2.9% increase to the gross tonnage handled by the port of Rotterdam, resulting in a throughput of 421 million tonnes in the year 2008.

In its developmental strides, the port of Rotterdam has a crucial drive to attract goods-flow and industry activities, especially as it competes for cargoes with other ports in the Hamburg-Le Havre (HLH) range (Port of Rotterdam Authority, 2009b).

As a pointer to its values, the Port of Rotterdam holds in its mission statement, that ‘we attract businesses that strengthen the port and the industrial complex, our spearheads being the throughput of containers, chemical and energy’ (Port of Rotterdam Authority, 2009b). This indicates that while the port gives focus to its core traditional services of port cargo throughput (shipment), it is also interested in attracting other related companies to boost its port complex business.

## **Port’s Core Activities**

### **4.3.1 Traffic Management**

As a covenant laid to the charge of the Harbour master, it is a principal role for the Port Authority to ensure that there is smooth, safe, clean and secure handling of shipping operations in the port.

The port reports it is actively involved in landside traffic flow management, and one of the projects that epitomises this claim is participation of the port in Keyrail project (a major rail operator) and also the establishment of a traffic management company to manage traffic in the port areas and major motorways (Port of Rotterdam Authority,

2009b). As a result of such wider involvement, the competitiveness of the port and its industrial complex has expanded, because the provision of transport infrastructure, as reported, would inevitably enhance accessibility into the hinterland.

#### **4.3.2 Land Area Management**

Another area of core management interest for the port has to do with the management of port land. The Port Authority is saddled with the responsibility of letting available port land to businesses on contract a basis. It is paramount to the port therefore that the port area is efficiently organised, in a manner that ensures good transport infrastructure, facilities and maintenance of high quality environmental standards. Strategically, the port is focused to providing space for existing clients, so as to enable them to expand their businesses while supporting new clients to setup operations (Port of Rotterdam Authority, 2009b). Attention is drawn to the fact that expansion of businesses and offering of value-adding services require an extent of land availability. Therefore, with respect to enhancing fast-growth of international traffic, some of the port's land management projects include:

##### **Reclamation Scheme: (Maasvlakte 2)**

In its strategic drive to provide port-user companies with land and space for operation, the Port of Rotterdam has a land reclamation project which is referred to by the Port Authority as '**Maasvlakte 2**' (Port of Rotterdam Authority, 2005). The project is for about 1000 hectares which though would be accessible for other activities, but shall particularly be utilised for container-related businesses. This represents a 20% increase in the surface area of the port and its industrial complex. In accordance with Port of Rotterdam Authority (2009b), the construction of '**Maasvlakte 2**' would mean a tripling of the capacity of container handling in the port area.

### **4.3.3 Cargo Operations**

As one of the leading ports in the world, the Port of Rotterdam Authority offers a wide variety of excellent cargo operations which could be precisely summed as follows:

#### **Liquid Bulk**

This group of cargoes are generally materials/products in liquid form that has not got any particular packaging mechanism, but flows freely. Petroleum is one type of liquid bulk cargo that stands out among others for the Port of Rotterdam.

#### **Petroleum (Oil and Chemical)**

Rotterdam has been home for many of the leading oil and chemical companies in the world, usurping the port's strategic location for access to European markets. There are four global-scale refineries and a diverse cluster of more than 40 modern world leading oil and petrochemical companies operating in the port (Port of Rotterdam, 2009a). These operations are interconnected and supported by a complex network of pipelines of more than 1,500 kilometres in length.

#### **Dry Bulk**

Dry bulk cargoes refer to those solid dry goods that are not usually cased or contained in a special way, but can flow freely, thus often need mechanised means for loading and discharging. For instance, coal, grain and similar cargoes are graded as dry bulk. About 83 million metric tonnes of bulk cargoes are handled in the Port of Rotterdam, of which agricultural bulk accounts for about 10 million metric tonnes and Rotterdam is a recognised centre for European agri-business (Port of Rotterdam, 2009a). There exists a diversity of service-provider-community in the dry agricultural bulk business, for example crushers, processors, food manufacturers, packagers, transporters and storage firms.

## Break-Bulk and RORO

There are twenty seven break-bulk and RORO terminals in the Port of Rotterdam, collectively handling a total of 25.6 million tonnes (Port of Rotterdam, 2009a). While RORO (Roll-On-Roll-Off) are cargoes that basically have the ability to move on their own, such as trucks, cars and other wheeled equipment, break-bulk are concerned with cargoes that are free, but might not flow freely as they may have been organised in some ways for better handling. Predominant break bulk cargoes handled by the Port of Rotterdam include steel, non-ferrous metal, project cargo, paper, fruit, forest products, automotive and others.

In view of the fact that the port is Europe's number 1 port, there exists modern facilities, good hinterland connections and wide varieties of logistics service providers. The port also reported that each of its terminals have specialities, concerned with making sure that the port's clients are provided with services that are tailored to their particular needs (Port of Rotterdam, 2009a). In this light, the break-bulk and RORO firms in the Port of Rotterdam are focused to customers' satisfaction through rendering of services that are 'customised, client-oriented, quick and reliable (i.e. a wide range of value-adding services).

## Containers

The performance of the Port of Rotterdam among other world top 10 container ports up to the year 2006 can be observed from figure 4.2, as prepared by maritime specialists in the World Bank division of Transport (Port and Maritime Transport Office).

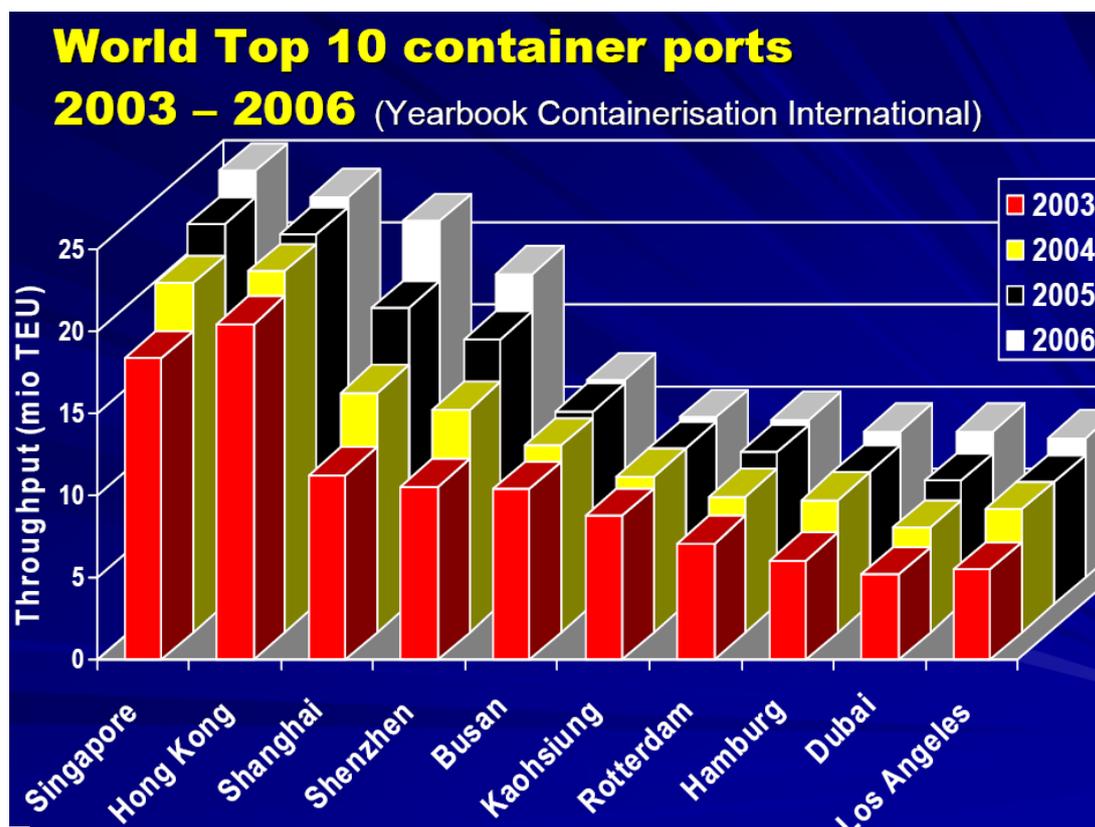


Figure 4. 2: World Ten Top Container Ports (Source: Kruck and Julian, 2007)

The port of Rotterdam handles a throughput of about an average of 9.7 million TEUs containers on annual basis (Port of Rotterdam, 2009a). Although the Port of Rotterdam is outstanding in the area of European container freight, figure 4.2 shows that other ports, such as Hamburg port, are vigorously competing for leadership in the European container handling business (Kruck and Julian, 2007).

Some of the features that have contributed to the port of Rotterdam becoming a very container-attractive-node include:

#### Capacity for Container Feeder Services

A unique endowment of the port according to Port of Rotterdam (2009a) is the strategic location of the port on the North Sea (Northwest Europe), which in turn gives the port an unlimited draft capacity and as such can accommodate modern super-containerships and even the larger container vessels of the future. Users of the port testify that it is able to effectively function as a feeder hub for cargoes that are designated to different parts of Europe, making it a point of first or last call for many Europe bound deep sea shipping lines. The Port therefore represents:

- An intercontinental service provider for Mega container vessels
- A major node in the global and European logistics chain
- A provider of tailor-made offers for containerised cargoes (i.e. for pre-transport and post-transport)

#### Reefer Containerisation

Reefers use specially designed forms of containers for the transportation of fresh fruits and vegetables in a manner that preserves quality. The Port of Rotterdam operates about 7,000 reefer points which have cold storage in the capacity of about 2.5 million cubic meters.

### 4.3.4 Ancillary Services

Ancillary services are in other words referred to as support or complementary services.

<b>ANCILLARY SERVICES (MAJOR SERVICE PROVIDERS)</b>	
<b>COMPANY</b>	<b>SERVICE</b>
AVR (Afvalverwerking Rijnmond)	Waste incineration / industrial cleaning / waste handling
Baris Group	Hazardous Goods storage
Botlekveem (De Rijke)	Hazardous Goods storage
C. Steinweg Handelsveem	Hazardous Goods storage
Caleb Brett	Cargo Surveying
Den Hartogh	Tank transportation / tank cleaning services
De Rijke	Tank transportation / drumming / hazardous Goods storage
Hoyer Nederland	Tank transportation / silo storage / tank cleaning services
Inspectorate	Cargo Surveying
Inspechem	Cargo Surveying
Kees in 't Veen	Tank transportation / Tank cleaning
LBC	Hazardous Goods storage / formulation / drumming
Multistar Logistics	Tank container leasing / transportation
Nijman-Zeetank	Tank Transportation
Railion Benelux	Rail handling
Saybolt	Cargo Surveying
SGS	Cargo Surveying
STR	Waste handling
Storeship	Hazardous Goods storage
Stork Industry Services	Mechanical maintenance
Talke	Tank transportation / silo storage
Van Leer	Drums / packaging
Van Mourik Services	Mechanical maintenance / industrial cleaning
VLS Pernis	Hazardous Goods storage / Container terminal / Rail handling
Vos Logistics	Tank Cleaning / Silo storage

Figure 4. 3: Ancillary services in Rotterdam Port (Source: Port of Rotterdam, 2007)

Illustration of figure 4.3 elucidates some of the offers of support and ancillary services in the Port of Rotterdam and their providers. It is important to note that while this case study on the Port of Rotterdam precisely covers some of its core operation areas, the main subject of this research project is concerned with value-adding services, which in turn are referred to as ‘support or complementary’ services.

In response to and anticipation of international trade and logistics developments, the Port of Rotterdam since the 1980s started developing ‘Distripacks’ areas, to provide space for product processing, warehousing, distribution and other logistical activities, mainly for companies in need of a European hub (Pettit and Beresford, 2009). These intended activities are ancillary or support services in relation to the core operations of the port. Thus the project is considered as one of the strides towards provision of value-adding services. The Port’s three ‘Distripacks’ are namely Maasvlakte, Botlek and Eemhaven.

#### 4.4 PD Teesport Port (United Kingdom)

The PD Teesport is one of the United Kingdom’s leading ports in various logistics service businesses and manages an extensive portfolio of properties. While its headquarters is in the Tees valley (North East of England) with varied operations at many of the key UK ports and logistics centres, PD Teesport is owned by Canadian-based Brookfield, a global asset manager in property, renewable power and infrastructure assets and is listed on the New York and Toronto Stock Exchanges (PD ports, 2008). As a result of PD Teesport’s significant operations of in other ports, the name ‘PD Ports’ is used to represent its port stakes and businesses in the United Kingdom. Figure 4.4 shows Teesport map and geographical location.

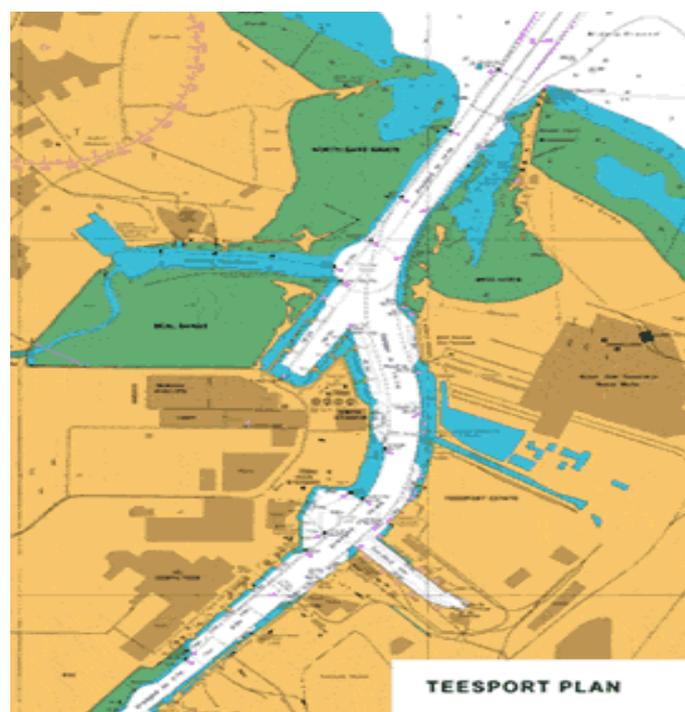


Figure 4. 4 PD Teesport’s map and geographical location (Source: PD Ports, 2008)

#### **4.4.1 Cargo Operations**

Facilities in PD Teesport include those of private wharves, offshore, ship repairs and support services. Some core areas of the port's cargo operations are discussed below:

##### **Containers (Lo/Lo)**

PD Teesport has purpose built container terminals which are equipped for speedy handling of container units. While there is focus on improving terminal superstructures at different phases of development, each of the two container terminals (TCT1 and TCT2) are equipped with two wide span gantry cranes respectively operating at a rate in excess of 25 and 30 moves per hour (PD Ports, 2008). These are very important for the Lift-On and Lift-Off (LOLO) container handling operations. TCT1 container terminal has a depth of 8.5 meters, whereas the depth for TCT2 is 10.5 metres.

##### **RORO Operations**

In the recent times, PD Teesport has experienced major growth in the area of Roll-On Roll-Off (RORO) operations, which is particularly concerned with the handling of self-movable cargoes. This is applicable, for example, in the area of importation of cars and other type of vehicles. The Teesport has achieved over 50% volume increase in the area of RORO business since the last five (5) years (PD Ports, 2008). Some of the port's major users of the RORO facilities and services are:

- P&O Ferries: the firm has operated in the port for more than 15 years and with 6 established sailing schedules per week to both Rotterdam and Zeebrugge. P&O has used the Teesport to access major routes to mainland Europe from the UK.
- Renault Cars: in conjunction with its partners, Renault cars imports over 100,000 trade cars each year using the 23 hectare storage facility. This level of operation has resulted to a long term contract between the port and Renault on vehicle enhancement work and import processing and preparation centre.

- General Motors (GM): With a further lease of five (5) hectares of storage for vehicles imported from European distribution centre in Zeebrugge, General Motors seeks to boost its use of the Teesport.

## PD Logistics

With headquarters at the Teesport, the PD Logistics unit offers warehousing and distribution services at thirteen (13) UK locations throughout the North East, Humberside, East Anglia and Felixstowe (PD Ports, 2008). In the stride to boost its portcentric growth strategy, the offers of the PD Logistics enable port users to:

- Circumvent the need for inland container movements
- Eliminate demurrage bills and quay rent for containers
- Reduce of inland movement by direct deliveries from the port premises
- Provide cross-docking operations that supports quick response to market
- Effectively manage and reduce inventory across the supply chain

Apart from Teesport, PD ports' operations in other UK ports are shown in figure 4.5.

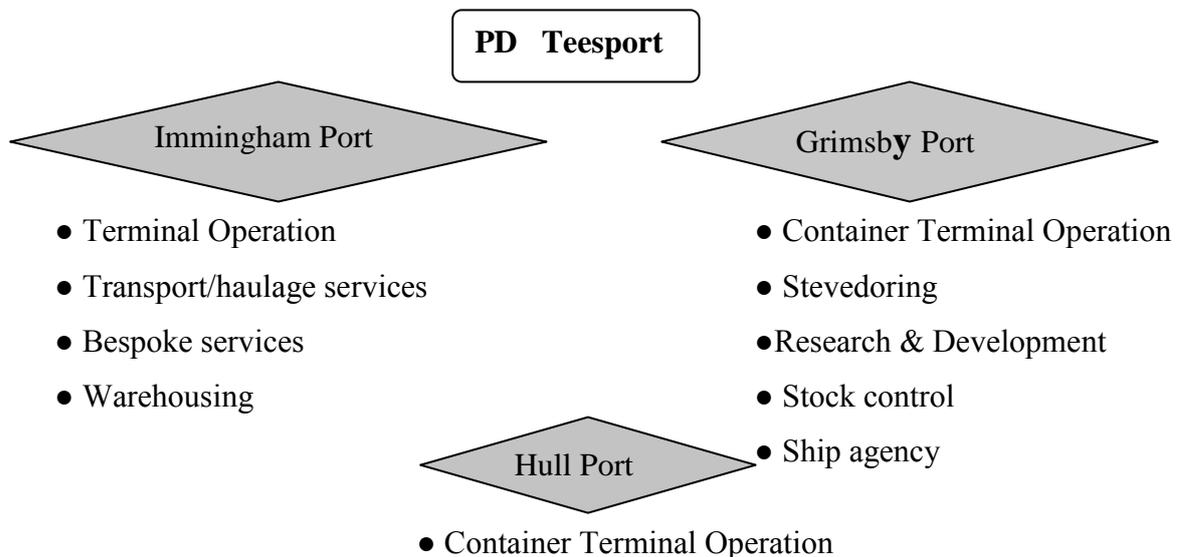


Figure 4. 5: Teesport operations in other key UK ports (Adapted from: PD ports, 2008)

#### **4.4.2 PD Ports in Immingham Port**

In the port of Immingham, PD ports happen to be one of the key port service providers. The port of Immingham is located on the south bank of the Humber Estuary, and in cargo volume terms, it is the third largest UK port (PD Teesport and Hartlepool, 2008; DfT, 2000; DfT, 2006). As illustrated in figure 4.5 above, the PD ports are actively involved in:

##### **The Operation of the terminal**

PD ports run a stevedoring operation in the port of Immingham that handles about 700,000 tonnes per annum through dedicated terminals (PD ports, 2008). This is only realistic given its diverse cargo handling equipment, enabling the loading, discharging, stacking and releasing of cargoes for distribution by rail or roads. The different cargoes handled by the PD terminal include minerals, forest products, aluminium, animal feeds, timber, zinc, fruits, ores, project materials and steel.

##### **Transportation Services**

PD ports offers transportation services in the Immingham port using a small fleet of vehicles dedicated to the port business. This transport service section achieves over 5,500 deliveries per annum.

##### **Warehousing Services**

Provision of storage and warehousing facilities and services is one area of PD ports businesses in the Immingham port. The company has over 500, 000 square feet for its covered warehousing services (PD ports, 2008). In addition, it also has 30 acres of secure open storage compound and provides a custom bonded service.

##### **Bespoke Services**

By bespoke services, the implication is that the PD port renders services that are directly tailored to the needs of any particular client at any given time. For instance, it designed and built a manufacturing plant for coated ferrous sulphate and also has a long term contract with a major Scandinavian chemical producer (PD ports, 2008). In essence PD ports provide value-adding services in the port of Immingham.

#### **4.4.3 PD Ports in Hull Port**

PD ports run a terminal at the port of Hull, which is according to the Department for Transport (DfT, 2006) the sixth busiest UK port in container handling as of 2004 and all cargo traffic throughput in this particular year totalled 12 million tonnes. The port of Hull is considered the fourth largest fishing port in England. Vessels that are up to a capacity of thirty thousand (30,000) dead weight (dwt) can be handled and there is the facility to handle about 250,000 TEUs on an annual basis by the PD port's terminal (PD ports, 2008).

#### **4.4.4 PD Ports in Grimsby Port**

As is the case in the port of Hull, the PD ports operate a container terminal in the Grimsby port. The Immingham and Grimsby ports are owned by Associated British Ports (ABP) (Associated British Port, 2009). In a site of 2.5 hectare, PD ports offer not only services for container handling, but also a range of other services like stock control, stevedoring, and ship agency services (PD Tees and Hartlepool, 2008).

#### **4.4.5 PD ports Operations in inland ports**

Inland ports are important for economic growth and social issues, for example in reducing road congestion. PD ports have stakes and operations in the following UK inland ports:

- Howden
- Keadby
- Cowes (Isle of Wight)

#### 4.5 Damietta Port (Egypt)

Historically, Damietta port is one of the oldest ports in Egypt from which a large volume of the country's commercial export operations are still carried out to different foreign nations, however completion of the modern port came to being in the year 1982 (Damietta port, 2009).

With a total area of 11.8 Km<sup>2</sup> of water to land area ratio 1:3, the Damietta port is situated in a location that is connected to the transportation network of rail, roads and rivers. In a further breakdown of these figures, Egyptian Maritime Data Service (2007) reported that while the land area is 8.5 Km<sup>2</sup>, the water area is 3.3 km<sup>2</sup>.



Figure 4. 6: The map and geographical location of the Damietta port. (Source Damietta Port, 2009)

The port's maximum length and breadth are respectively 4km and 3km. Figure 4.6 is a map showing the area and geographical location of Damietta port.

There are different operations carried out in the port and these can be categorised under the following terminals:

#### Container Terminal

The terminal has four berths on a length of 1.05km and in order to service third generation or contemporary mega containerships, the berths are in the depths of 14.5 metres. The actual and available annual container throughput of Damietta port is shown in the table 4.1.

Table 4. 1: Containers in Port of Damietta (Period 2000 - 2004)

	Year	2000	2001	2002	2003	2004
<b>Landed</b>	<b>Full TEU</b>	222,150	227,183	238,592	329,651	413,534
	<b>Empty TEU</b>	85,100	88,807	104,636	139,493	207,032
	<b>Tonnage</b>	1,080,571	2,328,097	2,544,076	3,567,940	4,284,022
<b>Shipped</b>	<b>Full TEU</b>	199,201	218,696	253,096	353,255	465,784
	<b>Empty TEU</b>	110,308	104,639	115,812	132,646	176,596
	<b>Tonnage</b>	1,691,380	2,472,612	2,647,968	3,930,453	4,896,724
<b>Total TEU</b>		616,759	639,325	712,136	955,045	1,262,946
<b>Total Tonnage</b>		2,771,951	4,800,709	5,192,044	7,498,393	9,180,746

(Source: Containerisation International Year Book, 2003 & 2006)

In table 4.1, a careful observation of the ‘landed and shipped’ tonnage rows showed that, more shipment or export of goods/materials was progressively carried out over the years in consideration, as opposed to goods ‘landed’ or rather imported through Damietta port. It is important to note however that both imported (landed) and exported (shipped) containers respectively continued to increase between the year 2000 and 2004, showing a positive trend of traffic flow through the Damietta port.

### General Cargo

Vessels of different cargoes of up to a capacity of 50,000 tonnes can be handled in the general cargo terminal which with a total length of 0.8km has four dedicated berths. The depth of the terminal is 12 metres, while its storage capacity and annual throughput are 1 million and 2.1 million tonnes respectively.

### Dry Bulk Terminal

Four berths in the total length of 900 metres are utilised for dry bulk cargo services with a terminal water depth of 12 metres. The storage capacity of the terminal is about 500,000 tonnes and it can also handle vessels of up to 50,000 tonnes. It might suffice to note that dry bulk products/ freight of concern are free flow cargoes such as cement, dry sand or concrete, that are not packaged or contained in any particular casing.

### Liquefied Natural Gas (LNG)

LNG and other petroleum related chemicals happen to be among the major cargoes that pass through the Damietta port on an annual basis. The key groups handling these categories of freight are SEGAS, United Gas Derivatives Company and the Egyptian Holding Company for Petrochemicals. The derivative and petrochemical companies have established specialised petroleum jetties on BOT (Build Operate and Transfer) contracts. As a result of the construction of various facilities, the production, storage, transport and export of petrochemicals and LNG products are made possible in the port area (Damietta port, 2009).

### **Other specialised terminals are:**

- Grains terminal
- Liquid bulk terminal

With a maximum capacity to berth and handle vessels of 14 metres draft, the annual throughput of the Damietta port is 19.75 million tonnes (Egyptian Maritime Data Service, 2007).

#### 4.5.1 Damietta Port in relation to Suez Canal & Other Egyptian Ports

In the relation other important Egyptian commercial ports, figure 4.7 shows the geographical location of the Damietta port in proximity to the Suez Canal.

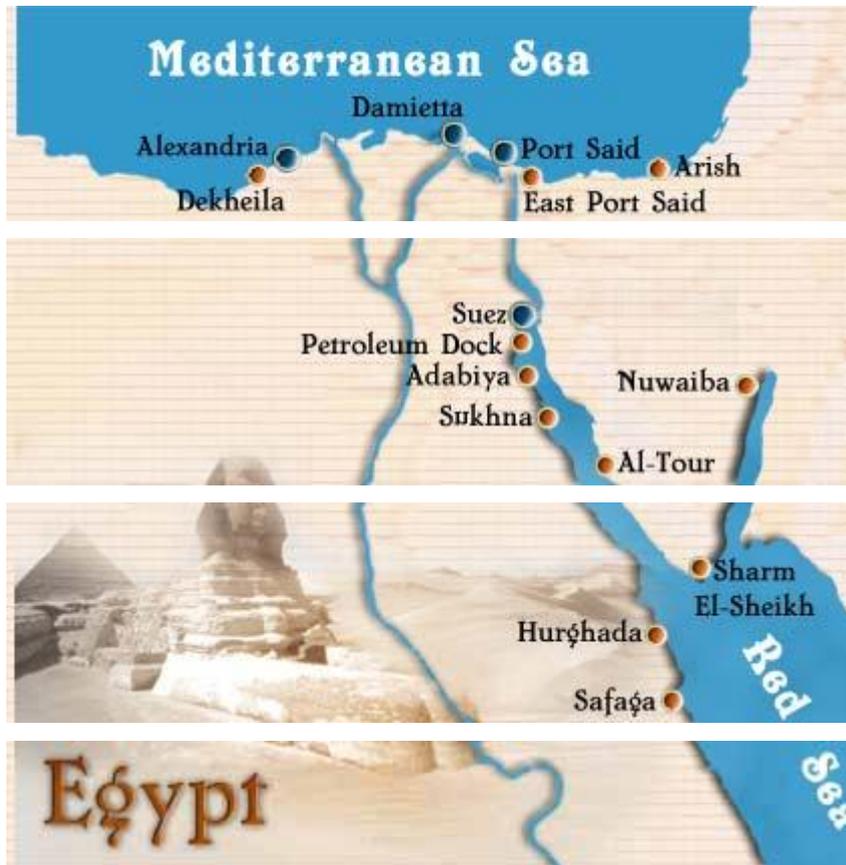


Figure 4. 7: Egyptian Commercial Ports (Source: Egyptian Maritime Data Service (2009))

According to the Egyptian Maritime Data Service (2007), the Suez Canal provides the shortest sea link between the East and the West as a result of its unique geographic location. The figure 4.7 illustrates the international importance of the Suez Canal in providing an essential connectivity between the Mediterranean Sea and the Red Sea, which respectively opens/widens into the Atlantic and Indian Oceans.

#### 4.6 Apapa Port (Nigerian Port Authority- NPA, Nigeria)

Apapa port, which is also known as the Lagos Port Complex, is owned by the Nigerian Ports Authority (NPA). The port is located in the South West of Nigeria and occupies a land area of over 120 hectares (Nigerian Port Authority, 2007). Figure 3.8 shows the geographical location of Apapa port in Lagos Nigeria.



Figure 4. 8: Geographical location Map of Apapa Lagos Port (Source: Oyibosonline, 2007)

Apapa port is the country's biggest port, handling a wide range of commodities and have specialized facilities in handling wheat, oil, cement, fish, dry cargo, and containers (World Port Source, 2010).

The port concession policy of the Federal government of Nigeria on Nigerian Port Authority (NPA) brought considerable changes in Nigerian ports, and Apapa port was no exemption. In this light therefore, it is of interest to start by a concise examination of the NPA (Nigerian Port Authority) and thereafter concentrate on Apapa port's operations.

#### **4.6.1 Nigerian Port Authority (NPA)**

To a great extent, Nigerian ports were operated independently until the government formed the Nigerian Ports Authority to coordinate the activities of all the ports.

In a bid to enhance the contribution of ports to the National economy, the Federal government of Nigerian's repositioning and restructuring of ports project resulted in the creation of NPA, enabling further provision of equipment for greater efficiency and contribution to the country's growth. The concession of Nigerian ports under NPA finally came into being in 2006. This journey toward port concession commenced on the 3<sup>rd</sup> December 2003 when the National Council for Privatisation advertised for Expression of Interest (EOIs) and subsequently took prospective bidders through due processes (Nigerian Port Authority, 2007).

The involvement of private business owners in the ports became clear, as seen in the emergence of private terminal operators. It is however necessary to observe that the Federal government of Nigeria did not fully privatise NPA, rather a landlord-operator kind of structure has been established.

Some of the key resultant functional obligations and service areas of NPA and the private operators (investors) are identified in table 4.2 below.

Table 4.2: Function Areas for NPA and Private Operators

<b>Nigerian Port Authority/Government</b>	<b>Private Operators</b>
➤ Policy formulation and legislation	Development and maintenance of port superstructure
➤ Ownership and administration of port land and waters.	Acquisition of cargo handling and other operation equipment
➤ Enact, monitor and enforce port regulations and bye-laws in operations	Maintenance of port terminal security and safety
➤ Maintenance of safety and security	Cargo handling and stevedoring
➤ Concession of infrastructure and leasing	Warehousing
➤ Set benchmark for tariff framework	Delivery services
➤ Nautical and harbour operations (pilotage)	Ship repairs, towage and mooring
➤ Hydro-graphic surveys	Bunkering, Ship chandelling etc

(Adapted from: Nigerian Port Authority (2007))

#### 4.6.2 The Apapa port Operators

The Nigerian Port Authority (2006) described Apapa port as the largest and most important Nigerian port, given its status marked by the opening of the Lagos lagoon for ocean going vessels in the early 1900s and contributions to the nation's economy.

As a result of the privatisation scheme by government, there was an infusion of port operators into the Apapa port system. These operators are shown in table 4.3.

Table 4. 3: Apapa Port Operators (Source: Nigerian Port Authority, 2007)

<b>Nigerian Port Authority/Government</b>
➤ Apapa Bulk Terminal limited (ABTL), operates terminals A and B on a 25 year contract
➤ ENL Consortium limited, operates terminals C and D on a 10-year contract
➤ Greenview Development Nigeria Limited (GDNL) operates terminal E on a 25 year contract.
➤ Eko Support services Ltd operates Bullnose 1, 2, 3 terminals on a 5-year contract.
➤ AP Mollar Terminals operates the container terminal on a 25-year contract.
➤ Maersk line operates the Ijora Lylipond terminal on a 10-year contract.

Apapa port accommodates the handling operations of various kinds of general and special cargoes. The Apapa quays alone covers a land area of 100 hectares on a quay length of 2,459 metres, with berth facilities capable of servicing up to 20 vessels at the same time in the depths (draught) ranging from 8.23 metres to 10 metres (Nigerian Port Authority, 2006).

### 4.6.3 Apapa Container Terminal

Apapa port stands out among all other Nigerian ports in the handling of containers and is a principal outlet for the country's exports (World Port Source, 2010). AP Moller-Maersk Group is a major private operator of the Apapa container terminal. Table 4.4 shows data on recent past years' container operations throughput in Apapa port.

Table 4.4: Apapa Port Container Throughput (NPA, 2003)

Year	Lagos Port		
	Inward	Outward	Total Throughput
2002	11,546,260	208,279	11,754,539
2003	11,653,962	221,303	11,875,265
2004	12,109,451	185,189	12,294,640
2005	13,206,813	225,293	13,432,106
2006	16,904,996	203,864	17,108,860
<b>TOTAL</b>	<b>65,421,482</b>	<b>1,043,928</b>	<b>66,465,410</b>

The container terminal area covers 44 hectares, having the capacity to handle up to twenty two thousand (22,000) TEUs of containerized cargo. On a total quay length of 950 meters the six container terminals have berths of 10 meters depths. There is a covered storage of 6.4 thousand square meters in the Apapa container terminal, with a container yard of 19.5 thousand TEUs capacity, and also contains 298 reefer plugs (World Port Source, 2010).

#### **4.6.4 General Cargo Operations**

Apapa port has the capacity to handle other types of cargoes, such as liquid bulk, dry bulk cargoes and break-bulk cargoes. Hence, the port is equipped to handle general cargo traffic. Other types of operations and cargo handling areas in the Apapa port include:

- Apapa dockyard
- Fish wharf
- Petroleum wharf and Atlas Cove tanker jetties
- Bulk vegetable oil
- RORO cargoes

#### **4.6.5 Support Service Provision**

The port offers a wide array of complementary port services to support port users, these include:

- Bunkering: Supply of essential fuels to sea-going vessels.
- Fresh-water: Adequate provision of portable water to the calling ships.
- Ship stores: Can facilitate the supply of victuals for ship stores. etc.

#### **4.7 Summary**

The main reasons for selecting the case study ports include that they are major ports in their countries and all handle general cargoes, also for easy accessibility of data. While this chapter has given attention to examining the perspectives and approaches to value-adding services in the ports, the core operations of the ports were also discussed. The port of Rotterdam in Netherlands and PD Teesport in the UK are both progressing in the modern portcentric practices, which increasingly support the offering of distribution and logistics services from and within ports. Both ports continue in their strides to attract service providers and individual companies to use the ports as points for customisation of services and operations. Egyptian Damietta port and the Apapa Nigerian port were reported to be major ports in their different countries; they also render some support or value-adding logistics services. The availability of land was found to be an essential strength in the capacity of a port to offer value-adding services and some of the common types of value-adding services discovered in the ports include: transport services, warehousing, fresh water supplies and other bespoke services.

## **Chapter 5 - Data Analysis Perspective**

### **5.1 Introduction**

In business and social science research, the interest is to discover something about a phenomenon that is theoretically assumed to be in actual existence in the ‘real world’ (engaging human beings in their environment). An analogy to this statement with regards to the present research project therefore would be that while the set hypothetical aims (sections 1.3 and 1.4) and conceptual framework represent assumed phenomena, the various ports in this study represent the real world.

Therefore, as in most research, data in this study were collected from the real world (Rotterdam, PD Teesport, Damietta and Apapa ports) to understand the theoretical phenomena of value-adding services. This quest to understand the phenomena in question was made possible by using available data to develop models of value-adding services that represent real world situations, which would then be further tested for discoveries, upon which conclusions can be made about the real world.

Firstly, this chapter starts by examining the theoretical basis of data analysis techniques that were carried out in this study. Aspects covered in this regards include discussions on univariate, bivariate and multivariate analyses. It then proceeds to report the processes of piloting primary data collection by questionnaire and interview processes.

Secondly, given that the following chapters (6 and 7) are dedicated to the main data analysis, preliminary data analyses will be presented in this chapter which primarily covered evaluation of survey response rate. Also, reasons for the selected research analyses and approach to organising case study ports’ data are provided in this chapter.

Finally, there will be a reliability assessment of all data obtained from the questionnaire survey of all the case study ports using the internal consistency method.

## 5.2 Research Variables

The nature of variables employed in a given study will predominately direct the types of analyses that can be carried out. As is the case in research measurements (McGivern, 2009; Proctor, 2005), table 5.1 shows the two major ways in which variables used for measurement can be grouped.

Table 5.1: Categorical Variables (CV) & Scale Variables (SV)

Categorical Variables (CV)		Scale Variables (SV)	
CV are types in which individual items can be grouped (Easternby-Smith et al., 2008; Cameron and Price, 2009); eg. marital status (single, married, divorced); Ethnicity (African, white, Asian). Categorical variables (CV) are of two types:		These variables are discrete, not groupings, and represent quantities of the measured elements (Easternby-Smith et al., 2008; Cameron and Price, 2009); e.g. age, scores of football match. Scale variables (SV) are of two types:	
Ordinal	Nominal	Count	Continuous
Related to ranking or logical ordering, e.g. for ship crew: second mate, first mate and master.	This group of CV have no particular ranking, e.g. categories of ships: dry cargo, passenger and tanker.	These are whole numbers; values that show for example 'how many ports there are in a country'.	These can be both whole and fractional numbers; as they show 'how much'.

Predominantly, data used in this study are categorical in nature, as they are appropriate in carrying out analyses necessary to reach all set research aims.

## 5.3 Levels of Statistical Analysis

### 5.3.1 Univariate

Univariate analyses are concerned with examining trends or characteristics in individual variables to be explored independently of other set of data (McGivern, 2009). Analyses covered under univariate category include descriptive distribution, frequencies, tendencies and summaries, which are usually represented by bar and pie charts, histograms and others. These types of analyses are very important and

informative, building the fundamental platform on which to carry out further relational or associative analyses in order to fully understand the characteristics of variables under investigation (Baker, 1991).

According to Sweet and Martin-Grace (2008), univariate analyses answer questions such as ‘how much, how often?’, and help to reveal limitations in data while giving informed indications to researchers on the types of advanced statistical procedures that can possibly be carried out as a result. In this research the univariate analyses carried out were reported in the form of frequencies, summaries, percentages and represented by tables, bar charts and pie charts. Baker (1991) cited Selltiz et al. (1959) in support of the idea that research progression should naturally commence by descriptive univariate analyses and proceed to more complex inferential analyses.

### **5.3.2 Bivariate Analysis**

In bivariate, while ‘bi’ stands for two, ‘variate’ is associated with variable. Green et al. (1988) strongly advocated the use of bivariate analysis in the examination of relationships between two variables that are of particular interest in a given research problem. They emphasised that the analysis provides a means of presentation of data for easy interpretation, even to researchers and managers with less statistical knowledge. The variables suitable for a bivariate analysis can either be categorical or scale (Bryman and Bell, 2007).

When two or more variables are considered simultaneously, cross-tabulation enables ascertaining the number of cases that fall into each of the several categories (Churchill, 2001). Cross-tabulation with two variables is referred to as bivariate cross-tabulation and there are also bivariate correlation and regression analyses (Green et al. 1988; Malhotra, 1999). Bivariate cross-tabulation can be used to show association between two categorical variables. The observation of an association relationship between two scale variables can be shown by bivariate correlation, while bivariate regression develops a mathematical equation for the prediction of relationship between variables.

### **Group Comparison by Bivariate Analysis**

There are different classifications and categories in the world such as race, colour, income, height and education. These produce both scale and categorical variables as discussed in section 5.2. One of the ways to draw understanding from variables of different structures is to analyse and compare their means by tests such as analysis of variance, t-test, box plots and bar charts (Sweet and Martin-Grace, 2008).

- **One-Way Analysis of Variance (ANOVA):** This is able to compare the mean values of a categorical variable to measure how it differs to the mean of a scale variable, and thereafter obtain the relationship's statistical significance. This relationship is not a causal one, but one of association.
- **Regression Analysis:** This evaluates both independent and dependent variables that are ratio/scaled to ascertain the nature and degree of association relationship between them, however does not imply a causality relationship (Schmidt and Hollensen, 2006). For example, linear regression is theoretically a bivariate analysis built on the assumption that for every unit change in the independent variable, there is a corresponding change that is consistent and proportionate in the dependent variable.

Although it was deemed necessary to highlight the fundamental mechanism of both analyses (ANOVA and regression), they shall not be used in this study, because meeting the research aims did not necessitate the use of scale data needed to carry out the analyses.

### **5.3.3 Chi-Square Test**

The chi-square test is a very widely acknowledged bivariate statistical test (Dillon, et al, 1994; Easternby-Smith, et al. 2008). As explained by McGivern (2009), chi-square is a measure of association that commences by computing the frequency distribution expected in two variables to ascertain if there were no association between them, and then compares these expected frequencies (E) with observed frequencies (O) in the variables. Then it proceeds by squaring the differences between the observed and expected frequencies and dividing them by expected frequencies (E) for every cell in a contingency table. In essence, chi-square test enables the testing of relationship

between two categorical variables (Churchill, 2001; Cameron and Price, 2009; Crimp and Wright, 1995); and would be used mainly in testing the propositions set out in this research project.

The chi-square test analyses were carried out in section 7.4 in order to establish if there were significant levels of relationships between some research variables.

### **5.3.4 Multivariate Analysis**

Multivariate analysis describes an analysis where the relationship of multiple independent variables and a dependent variable are tested. A fundamental concern of multivariate analysis is the simultaneous relationship among two or more phenomena, in order to create robust models that satisfy both mathematical and theoretical assumptions (McDaniel and Gates, 1998; Malhotra, 1999; Sweet and Martin-Grace, 2008). An outline of examples of multivariate analysis was given by McDaniel and Gates (1998) to include multiple regression analysis, multiple discriminant analysis, cluster analysis, factor analysis, conjoint analysis and perceptual mapping. Factor analysis is a type of multivariate analysis carried out in this study and its fundamental features are hereby discussed.

- **Factor Analysis**

The use of factor analysis is to explore and collate data in a way of summarisation based on the interdependency of the variables in question has been widely acknowledged (McGigivern, 2009; McDaniel and Gates, 1998). Typically, the goal is to reduce a large set of data to manageable group sizes according to underlying relationship in the data. Hence, it provides a basis to further understand the interrelated group of data from a larger poll of data and to facilitate inferential analysis and discussions. This view was also confirmed by Proctor (2005) and Malhotra (1999) that factor analysis is a known multivariate statistical technique in which a whole set of data's interdependent relationship is examined. While most known statistical techniques that test relationships would clearly specify independent and dependent variables, factor analysis does not have this kind of specification basis.

In this study, factor analysis was carried out on a poll of identified variables or criteria for port selection in order to further understand them, in subgroups, based on their interrelatedness. This is reported in section 7.3.

#### **5.4 Test's Significance**

The inferential analyses carried out in this study, particularly those of chi-square and factor analysis, shall be assessed mainly on the significance of the tests results. Hence, it becomes necessary to have a brief theoretical understanding of test's significance. When statistical tests are run on a given sample, relationship(s) between variables are tested to ascertain if the resultant trend(s) would likely continue to exist in another sample drawn from the same population or if it were possible to study the entire population (Sweet and Martin-Grace; 2008). If a test's result reveals a consistent trend, the relationship under examination is said to be statistically significant. Observations on research variables (data) from a given sample might seem to show relationships when it is actually a product of occurrence by chance, on the other hand, there may be the existence of a discernable (real) relationship (Cameron and Price, 2009). It is as a result of this cloudy projection of relationships in variables that establishing the degree or strength of relationships in tested variables has become crucial in statistical analyses. This degree of relationship gives an indication of the level of confidence that can be put on a test's result in reaching conclusions on research aims.

Thus, significance levels in statistical tests offer the probability that observed trends in data are produced by chance (Parasuraman, 1991, Dillon, 1994). It therefore follows that given a set benchmark value (significance level) in a particular test, a statistically significant relationship in variables can be determined if the significance is sufficiently lower than the set benchmark value.

For the chi-square test in this study, the set significance level was 0.05 (section 7.4). Bartlett's test and KMO are two types of tests that can be used to assess factor analysis' test results. A KMO value in the range of 0.5-1.0 and a Bartlett's test value significant at 0.05 confirm appropriateness of a factor analysis outcome (Malhotra, 1999). See section 7.3 for details of the tests' application in this study.

## **5.5 Piloting of Primary Data Collection**

In order to assess the validity and reliability of questions in the questionnaire and interview checklist, pilot tests were carried out. Piloting guidelines as validated by Saunders et al. (2007) and Fink (2003) were utilised, ensuring that the exercise included all major variations of the population of port users and port management involved in the investigation by questionnaire survey and interview process.

In line with this process, initial questionnaires were administered to survey 7 (seven) different port-user companies in case study ports, covering stevedores, freight forwarders, shipping lines, importers, exporters and others. Data collected from this preliminary survey were pilot-tested and the results showed that responses from respondents produced information that was consistent and useful for measurement and understanding of the intended research variables. These included, rightly giving examples of value-adding services in the ports and appropriately indicating the likely usage rate of value-adding services and ranking them according to importance. This method of evaluating data and data collection medium by judgement and face validation is supported by Hague et al. (2004) and Lunn et al. (1986).

For the interview aspect of data collection, the initial interview-checklist was used to interview three (3) interviewees from the cadre of port management, as a way of test-piloting to ensure clarity, reliability and validity.

Consequent upon the interview-pilot process, other relevant issues and lead questions were identified, which enhanced understanding of core research variables. Particularly, the need to explore the impact of 'landlord-port operator' management structure in ports with regards to port strategy development emerged during the pilot test. As a result, this management structure issue received additional attention in the final versions of the interview checklist.

By carrying out a pilot test of the questionnaire and interview checklist, the following were achieved:

- Better understanding of questions, which were updated for sequential flow of issues being addressed
- Identifications of questions which seemed to be differently understood
- Changes deemed necessary in the final questionnaire and interview checklist were made

Note that non-fully completed questionnaires were not used in the research so as to ensure consistency of opinions. It is therefore believed that any possible problems with respect to the respondents' understanding of the final refined questions were minimised.

## **5.6 Preliminary Analyses**

This section will assess the quality of all research data prior to the commencement of the main aspects of data analysis, as reported in the following chapters (6 and 7). Research data were assessed using preliminary data analyses. These analyses which were carried out after the piloting of primary data collection process include response rate evaluation and data reliability assessment.

## **5.7 Survey Response Rate**

Survey response rate is concerned with the proportion of questionnaires that returned in useable standards in relation to the total questionnaires used in surveying the sample size of the research (Cameron and Price, 2009; Bryman and Bell, 2007).

### **5.7.1 Response Rate 1 - (Ports in Developed Economies)**

1. A total of one hundred and twenty (120) port-user companies were sampled and questionnaires were sent to them. (Refer to section 3.5.1 for full details of the simple random sampling method used in the selection of the port users).
2. Of the total number of questionnaires sent out for survey in the ports (Rotterdam and PD Teesport) in developed economies, 37 questionnaires returned fully completed and acceptable/useable.

3. Only one (1) of the questionnaires was classified in the unsuitable/unreachable category (see equation below).
4. The proportion of the returned questionnaires represented a response rate of 31% of the total number of questionnaires sent out for the survey.
5. The response rate above in (4) was obtained by:

$$\begin{aligned}
 \text{Equation} &= \frac{\text{Number of usable Questionnaires}}{\text{Total Numbers} - \text{unsuitable/unreachable sample members}} \times 100 \\
 &= \frac{37}{120-1} \times 100 \\
 &= \frac{37}{119} \times 100 \\
 &= 0.310924 \times 100 \\
 &= 31.0924 \% \\
 &= 31\%
 \end{aligned}$$

At the receipt of twenty two (22) questionnaires, an intermediate or preliminary analysis was carried out on the returned questionnaires. Though there were clear trends of majority opinions to meet research aims, it was nonetheless deemed important to increase questionnaire responses from the field survey. A second stage of the preliminary analysis ensued when the total number of the returned questionnaires reached 37 which yielded a response rate of 31% as calculated above.

While this response rate is quite acceptable in most social and business research, close observation of results from the follow-up preliminary data analysis (reported below) showed strong consistent trends.

**Note: Reason for Merging Rotterdam and PD Teesport Questionnaire Data –**

It is important to point out that although the different stages of response rate analysis showed strong consistency in data, a smaller number of responses were obtained from Rotterdam and PD Teesport port users. Given this outcome and because analysis revealed that case study information and primary data from both ports had no discernable difference, collected questionnaire data from the Rotterdam and PD Teesport ports were merged together. The significance of a response rate is in ascertaining that those who did not participate do not considerably differ from those who did participate (Bryman and Bell, 2007; Malhotra, 1999).

At the response rate of 31% the consistency shown in data trends indicated that a significant rate has been reached. For example, consistency in data trends on two research issues is reported by the aid of table 5.2, table 5.3, and table 5.4 which showed that there would not be significant difference in continuing data collection. These presentations illustrate clear and dominating opinions of port users on the issues of: availability of value-adding services; impact of value-adding services in attracting port users and impact of value-adding services in the retention of port users respectively.

Table 5.2: Availability of Value-Adding Services (Rotterdam & PD Teesport)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	31	83.8	83.8	83.8
	NO	6	16.2	16.2	100.0
	Total	37	100.0	100.0	

(Note: ‘Yes’ affirms the availability of value-adding services, while ‘No’ indicates the service is not available).

Table 5.3 : Impact of VAS on attracting port users (Rotterdam & PD Teesport)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More Attractive	22	59.5	59.5	59.5
	Less Attractive	9	24.3	24.3	83.8
	Makes no Difference	6	16.2	16.2	100.0
	Total	37	100.0	100.0	

Table 5.4: Impact of VAS on Port Usage Frequency (Rotterdam & PD Teesport)

		Frequency	Percent		Cumulative Percent
Valid	More Frequently	21	56.8	56.8	56.8
	Less Frequently	9	24.3	24.3	81.1
	Makes no Difference	7	18.9	18.9	100.0
	Total	37	100.0	100.0	

These trends in data in regards to the opinions of majority of port users provided the basis for the decision that collection of more data will not make significant changes in the data trends. Detailed analysis of various research issues will be carried out in chapters 6 and 7.

### 5.7.2 Response Rate 2 - (Ports in Developing Economies)

1. A total of one hundred and twenty (120) port-user companies were included in the sample and questionnaires were sent to them. (Reference should be made to section 3.5.1 for full details of the simple random sampling method used in the selection of the port users).
2. Of the total number of questionnaires sent out for survey of ports in developing economies, 74 questionnaires were returned fully completed and useable.
3. Only two (2) of the questionnaires emerged to be classified as unsuitable (see equation below).
4. The proportion of the returned questionnaires represented a response rate of 63% of the total number of questionnaires sent out for the survey.
5. The response rate above in (4) was obtained thus:

$$\begin{aligned}
 \text{Equation} &= \frac{\text{Number of usable Questionnaires}}{\text{Total Numbers -unsuitable/unreachable sample members}} \times 100 \\
 &= \frac{74}{120-2} \times 100 \\
 &= \frac{74}{118} \times 100 \\
 &= 0.627112 \times 100 \\
 &= 62.7112 \% \\
 &= 63\%
 \end{aligned}$$

On the receipt of forty six (46) questionnaires, an intermediate or preliminary analysis carried out on the returned questionnaires showed strong consistent opinions amongst

a majority of the respondents. Nevertheless, further field survey followed in order to increase responses and gather more data.

Another preliminary analysis carried out for the second stage took place when the total number of the returned questionnaires summed to 74. At this magnitude, the calculation of the response rate of survey of port-user companies in developing economies as shown above (5.7.2) resulted in 63%.

Overtly a response rate of this degree represents a significantly acceptable representation in surveys of this kind. In addition, close observation of trends in the preliminary analysis of data distributions, as represented by table 5.5, table 5.6 and table 5.7 substantiates the strength of the response rate, thus supporting the view that enough data had been collected.

Table 5. 5: Availability of Value-Adding Services

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	YES	54	73.0	73.0	73.0
	NO	20	27.0	27.0	100.0
	Total	74	100.0	100.0	

Table 5.6: Impact of Value-Adding Services on Attracting Port Users

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More Attractive	61	82.4	82.4	82.4
	Less Attractive	8	10.8	10.8	93.2
	Makes no Difference	5	6.8	6.8	100.0
	Total	74	100.0	100.0	

Table 5.7: Impact of Value-Adding Services on Port Usage Frequency (Retention)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	More Frequently	56	75.7	75.7	75.7
	Less Frequently	12	16.2	16.2	91.9
	Makes no Difference	6	8.1	8.1	100.0
	Total	74	100.0	100.0	

**Note: Reason for Separately Analysing Damietta and Apapa Ports' Data**

Of the 74 completed useable questionnaires from port users in case study ports in the developing economies, the proportions from the ports are:

- Damietta port – 35
- Apapa port – 39

For both Damietta and Apapa ports, the response rates were high. On this basis, data from both ports were kept and analysed separately. In addition, another important reason is that this study gives a particular focus to investigating how value-adding services can competitively be used in ports of developing economies, supported by the experience of ports in the developed economies.

**Total Returned Questionnaire:** The total of all questionnaires that were returned in a useable condition from port users in both ports situated in developing and developed economies amounted to one hundred and eleven (111), out of the total of two hundred and forty (240) that were sent out. The breakdown being: 37 for Rotterdam and PD Teesport, 35 for Damietta port and 39 for Apapa port. Data from these questionnaires are organised and presented in chapter 6 for analysis.

## 5.8 Research Data Reliability Assessment

The term reliability is primarily a concept concerned with measuring consistency in data. For reliability of data in this study, internal consistency was evaluated before main data analysis was carried out. Internal consistency is concerned with data homogeneity and can be tested by inter-item consistency or the split half methods (Gulliksen, 1945; Bryman and Bell, 2007). It shows the degree of correlation in different items that measure related underlying principles.

Another means for reliability evaluation can be through a stability check; however that of internal consistency was used in this research because it offered a straightforward method. This method is essentially based on the approach of measuring reliability by Cicourel (1964) as cited by Bryman and Bell, (2007). All data collected by questionnaire were combined together in the test for reliability. This can be better comprehended as explained below:

Table 5.8: Preference of VAS \* Impact of VAS on Attracting Port Users Crosstabulation

		<i>Impact of Value-Adding Services on Attracting Port Users</i>				Total	
			More Attractive	Less Attractive	Makes no Difference		
<i>“Port Users Prefer Value-Adding Service Port”</i>	Strongly Disagree	Count	1	2	0	3	
		% of Total	.9%	1.8%	.0%	2.7%	
	Disagree	Count	1	6	1	8	
		% of Total	.9%	5.4%	.9%	7.2%	
	Makes no Difference	Count	9	7	5	21	
		% of Total	8.1%	6.3%	4.5%	18.9%	
	Agree	Count	31	2	4	37	
		% of Total	27.9%	1.8%	3.6%	33.3%	
	Strongly Agree	Count	41	0	1	42	
		% of Total	36.9%	.0%	.9%	37.8%	
	Total		Count	83	17	11	111
			% of Total	74.8%	15.3%	9.9%	100.0%

Cross-tabulation operation matches data from various variables of interest so as to show the linkage between them (Churchill, 2001; Green et al. 1988). Table 5.8 showed the results of SPSS cross-tabulation of data from questions number 8 and 9 of the questionnaire which are respectively concerned with opinions on ‘preference of a port that offers value-adding service’ and ‘the impact of value-adding services in regards to attracting port users to a port.’ A respondent’s answer to the two questions ought to be in synchronization, since both questions are basically the same but asked in different ways.

At this juncture, consider table 5.8 row-wise for opinions to the statement ‘port users prefer value-adding service port’, having options: **Strongly Agree, Agree, Makes no Difference, Disagree, Strongly Disagree.**

Essentially, the degree of consistency for each option should be a higher percentage on the circled points (consider row and column interjections), as compared to the corresponding total percentage on the ‘**Total column**’.

Beginning from the top part of table 5.8, observation across the row showed that of the **total 2.7%** respondents who ‘**strongly disagree**’ that port users would prefer ports that offer value-adding services, **1.8%** retained a consistent opinion that the **impact of value-adding services on attracting port users would be ‘less attractive’** while only **0.9%** held the ‘more attractive’ option.

In the same order, out of the total **7.2%** respondents who ‘**disagree**’ with the view that port users prefer ports offering value-adding services, a great proportion (**5.4%**) (see as circled on table 5.8) of the respondents had a much more consistent view of value-adding services being ‘less attractive’.

For the ‘**agree**’ row, which showed that of the total **33.3%** respondents who agreed to the statement that ‘port users prefer ports that offer value-adding services’, attention is hereby drawn that **27.9%** of them were of the consistent view that the services would be ‘**more attractive**’ to port users in response to the question on the impact of value-adding services.

Finally, of the total **37.8%** respondents with the **'strongly agree'** view that port users prefer ports that offer value-adding services, a closer observation showed that **36.9%** of them gave a very consistent opinion, by reiterating that value-adding services would **'attract more'** port users while answering another question on the impact of value-adding services. Opinions that cast some shadow were very negligible and are nonetheless not surprising in a large scale survey response rate, as is the case in this research. It is noteworthy that the different analyses of the cross-tabulation results on table 5.8 revealed that a far greater percentage of respondents' data demonstrate substantial consistency.

### **5.9 Summary**

In this chapter, it has been shown that some of the analyses to be carried out in this study include univariate, bivariate and multivariate analyses. Questionnaire and interview methods of data collection were piloted and preliminary analyses carried out in preparation for main data analysis in the following two chapters (6 and 7). The data collection processes and collected data proved to be both valid and reliable to reach research aims. One hundred and eleven (111) questionnaires were returned useable, yielding response rates of 31% and 63% respectively from port-user companies in developed and developing economies' ports. Given the level of response rates and focus of the research on developing economy ports, in the chapters that follow, data from ports of the developing economies will be analysed separately whereas those of the developed economies will be analysed jointly. On the basis of consistency of trends in data evidenced in the preliminary analyses, confidence was established in the information for analyses and discussions of research data in the following chapter 6.

All selected research analysis methods in this research are required in fulfilling the research aims. The univariate analysis by generation of frequencies and percentages enabled the exploration of data on the different issues of the research. Piloting of data and response rate analyses respectively provided for establishing the quality of data and evaluation of the level of useable returned questionnaire. Chi-square test and cross-tabulation are bivariate analyses that supported the testing of propositions and cross-examination of research issues. The factor analysis process is the multivariate analysis needed to evaluate criteria for port selection by port users.

## **Chapter 6 - Analytical Presentation and Discussion of Research Data**

### **6.1 Introduction**

The primary objective of this chapter is to systematically present the analysis of research data from a survey of port users by questionnaire. An overall view of data exploration will be presented and discussion will be based on trends in data collected from the case study ports.

In view of changes in present-day industries, the different port service areas shall be analysed to understand services and trends of service development in ports. Also, there shall be discussion on job designations, which will give insight into some of the contemporary port users' job portfolio in the port industry. Another area which will be covered in this chapter is investigation of qualifications in relation to port users' years in port business.

The availability status of value-adding services in the case study ports shall be presented as indicated by port users. Port users' opinions on the importance of the various value-adding services will be discussed. This shall be followed by analysis of the likelihood of using value-adding services.

These discussions shall largely be based on results of univariate analyses, for example, covering the generation of frequencies and percentages. These analyses and discussions in this chapter are set to provide overall exploration of value-adding services. In addition, the chapter presents a fundamental foundation for more inferential bivariate and multivariate analyses in chapter 7.

## 6.2 Port Service Areas

A profiling of port users is definitely important in order to comprehend the modern-day port logistics profession. This therefore necessitated the quest for an examination of the active players in the port industry. Who are port customers or users? Nettle (1988) held the view that port users or customers are basically comprised of those who bring goods into the port (deliverers) and those who take them away. While this description adequately meets a general and traditional view, it is pertinent to observe that the contemporary port has witnessed an increase in the types of port users engaged in port businesses (Zondag et al, 2008).

Figure 6.1 depicts the major service areas of port-user companies in the port.

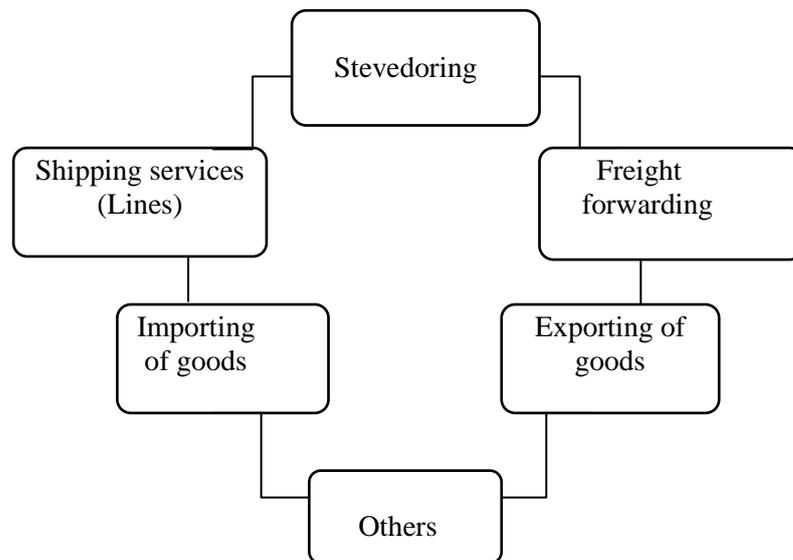


Figure 6.1: Areas of port services (Source: Author)

Results on the service areas based on the survey of one hundred and eleven (111) port-user companies in the four case study ports (Apapa, Damietta, PD and Rotterdam) are reported:

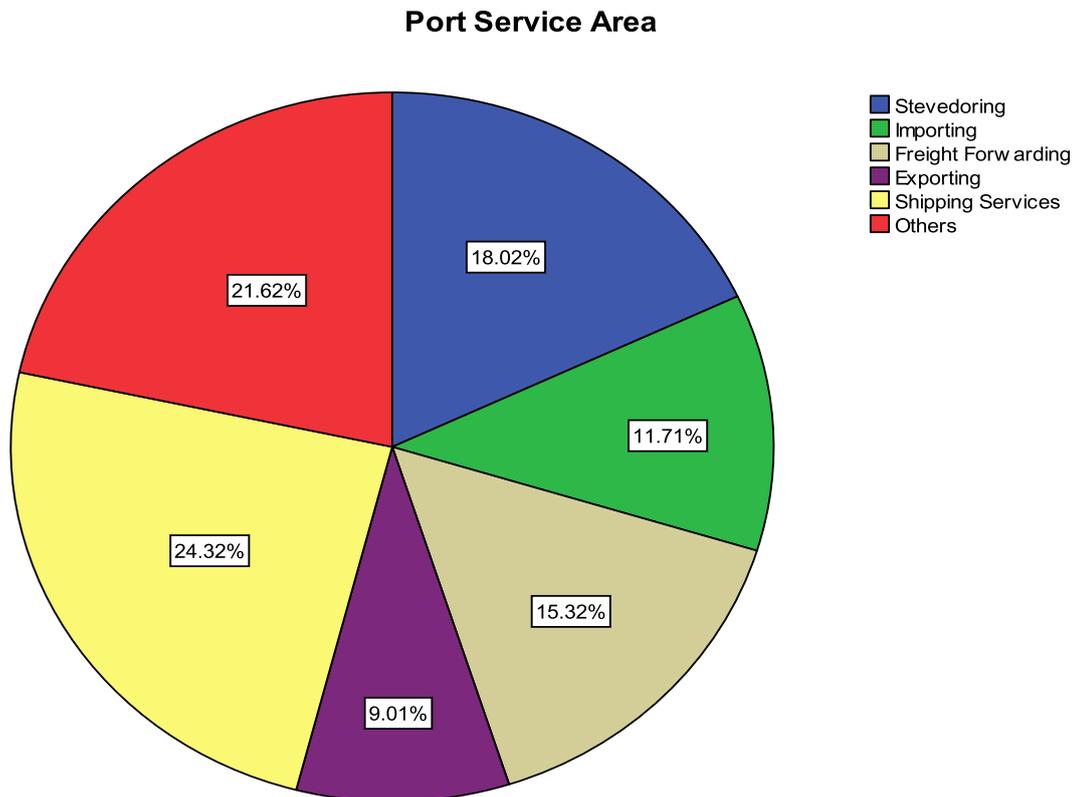


Figure 6.2: Areas of port services (Source: Author)

The figure 6.2 presents the analysis of business involvement of all port users consulted, hence showing the port service areas investigated in the research project. These service areas include stevedoring, imports, exports, freight forwarding, shipping services and others. While stevedoring and freight forwarding, by proportions, retained considerable service areas in port business, shipping line business had the highest proportion of port users with 24.32% and by implication represent the most important area of port services.

Alizadeh and Nomikos (2009) and Haralambides et al. (1997) in discussing the contributions of shipping to the development of international trade, pointed out that ports have experienced massive changes as a result of advances in ships and shipping

lines. Pettit and Beresford (2009) recognised that one of the fundamental influences on the type of strategy adopted by a port is dependent on the requirements of the shipping lines utilizing the port's facilities. In essence therefore, the throughput of cargo handled in any port is largely dependent on the types of ships and frequencies of calls to the port.

Of particular interest is the outcome that 21.62% of the services were categorised as 'others', which gave an indication of growth in services that are different from the major services rendered in ports. This proportion of 'other' services that are not core port services can be said to point to an increasing opportunity for the offering of a wide range of value-adding services in ports. Also, it signals the growing role of the maritime sector, in particular the port industry in the modern global supply chain and economy. According to information gathered from port users, some of the services in the category of 'others' include trucking, warehousing, commodity financing, maritime/international trade consultancy, labour and specialist services.

In acknowledgement of these trends, Pettit and Beresford (2009) held that ports are going through an evolutionary experience of being more responsive in offering various tailoring services to customers. Again, it is the view of Carbon and Martino (2003) that the changing roles of ports necessitated a move to offering varied services and participation in supply chain management.

Figure 6.2 on the other hand depicts that data in this research were gathered from fair representation of well established port users from different service areas. It thus further validates the sampling methods used.

### 6.3 Port-user respondents job designations

As a follow-up to discussions on trends in port service areas, this section is dedicated to presenting the job designations of port users who supplied data in this research project.

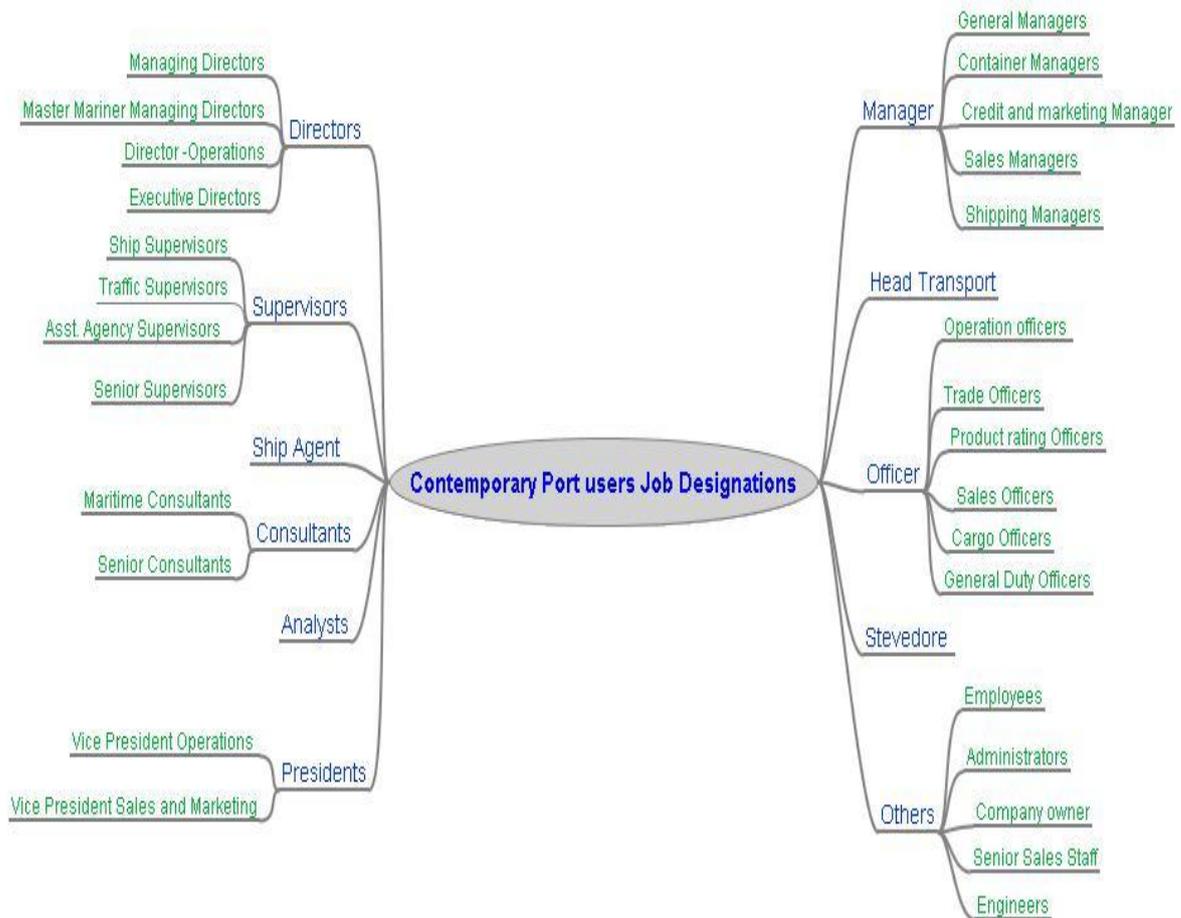


Figure 6.3: Mapping of port-user respondents’ job designations (Source: Author)

Figure 6.3 shows a mapping of job designations of port users engaged in the research. By these varieties of job designations, insight is given towards understanding some of the contemporary port users’ job portfolio in the port industry. It is necessary at this point to state that the above port-users (from whom data were drawn), despite the variations in job titles, are in one sort of management role or the other in their different companies. Among the one hundred and eleven (111) total port-user

respondents from the four case study ports were analysts, managers, officers, directors, ship agents and presidents. Others include administrators, engineers and consultants.

Understandably, the integrity of data and resultant study outcomes are largely dependent on the sources of the data. With the need for data integrity in view, painstaking efforts to reach the right personnel in the port-user companies yielded dividend by effectively reaching and drawing data from the various designated managers, as herein represented.

Job designations have direct relationship with responsibilities and roles in a given firm and according to Carbon and Martino (2003), the position of ports as principal nodes in the global transport network have resulted in the emergence of different roles in response to the demands of supply chains. As opposed to a traditional setting where port businesses predominantly revolved around shippers and importers of goods, observation in the illustration of figure 6.3, showed that contemporary ports have witnessed an increase in the varieties of port users, job designations and eventually port business areas.

#### 6.4: Investigation on Qualifications and Port Users years in Port Business

Table 6.1 shows some fundamental statistical information on interrelationship between qualification and years in port business based on data collected from port users of the four case study ports.

Table 6 1: Qualifications and Port Users years in Port Business

Years of experience in Port business	Highest Qualification Categories					
		Lower than High School	High School	Bachelor Degree	Post-graduate Degree	Others
	<b>N</b>	3	18	55	32	3
	<b>Mean</b>	21.00	12.53	11.62	16.39	27.33
	<b>Median</b>	30.00	8.00	10.00	14.00	30.00
	<b>Std. Dev</b>	16.462	8.110	8.790	11.692	6.429

The Chartered Institute of Logistics and Transport (United Kingdom) stressed the dividends of gaining professional logistics specialised qualifications and the resultant impact on enhancing the capability to reduce delays in operations, lower costs and improve efficiency (CILT, 2009).

The overall average (mean) of years spent by port-user respondents in the port industry was found to be 13.80. The frequency level of 55 (see table 6.1), showed that most port user-respondents are qualified to bachelors degree level. Dinwoodie (2000) while discussing issues on management careers and education in shipping and logistics, reiterated that future employability, personal advancement and fulfilment of organisational objectives are some of the motivating desires for undertaking studies at university level for both bachelor's and postgraduate degrees. Hence, findings of this study that most port users hold a first degree can be considered as being an encouraging trend in logistics industry career. Reference should be made to appendix 7 for a summary of analysis and more details on years spent in port business as related to port service areas and qualifications.

## 6.5 Availability of value-adding services in Ports

At the onset of the research survey, information on the availability status of value-adding services was sought from port users and the results are hereby presented.

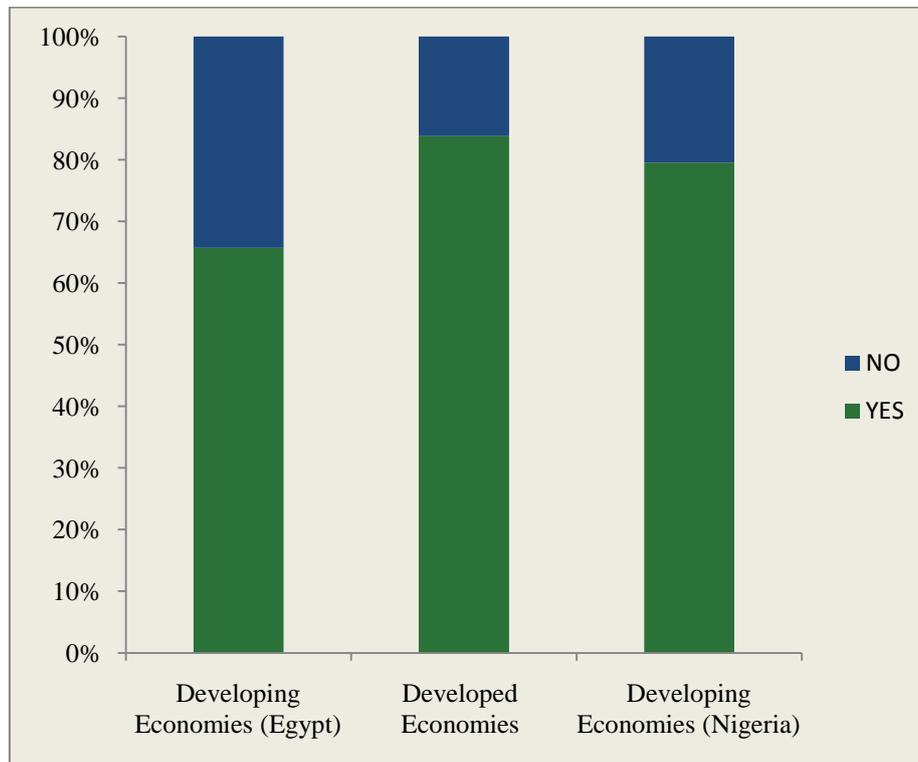


Figure 6.4: Indications of availability of value-adding services

This initial enquiry proceeded only after a precise definition of value-adding services in the context of this research. Hence the main aim of the section is to report findings on availability of value-adding services. Figure 6.4 and the subheadings below in this section are used mainly to report the statistics on opinions of availability of value-adding services, while in-depth discussion follows thereafter.

- **Value-adding services availability (Rotterdam & PD Tees ports' perspective)**

The availability of value-adding services in the ports was affirmed by 83.8% of all the port user-respondents in the Rotterdam and PD Teesport ports. On the other hand, 16.2% of the respondents were of the view that the services do not exist in the ports.

- **Value-adding services availability (Egyptian Damietta Port perspective)**

Of all the Egyptian Damietta port users that took part in the survey, 65.7% held that there are value-adding services in Damietta port, while 34.3% were of the view that the services were not available in the port.

- **Value-adding services availability (Nigerian port's perspective)**

While it was the view of 79.5% of the port user-respondents that value-adding services are available in the Nigerian Apapa port, 20.5% of the respondents were of the opinion that the services are not in existence in the port.

These give insight into the availability of value-adding services in the ports. The availability of services for users, as required, is of immense importance for the continuity of any firm. Providing products and services in a responsive manner to end-users is a very important key performance indicator (KPI) for competitive logistical edge in business (Fernie, and Sparks, 2004). In other words, a strategy of ensuring products and services are readily available in the market strengthens the prospects of a firm (Jeannet and Hennessey, 1998).

## **6.6 Key Value-adding Service Availability**

While the earlier section 6.5 on 'availability of value-adding services' gave attention to discussing findings on the general availability status of value-adding services, this section is particularly geared towards in-depth investigation on the availability status of the 10 identified key value-adding services. This shall be done on case study port basis.

- **Availability of value-adding services (Case study ports perspective)**

The opinions of port users as concerned with availability status of VAS were examined and hereby presented. Discussion shall take place given observable trends in each case study port. Common parameters for the analysis and discussion of VAS availability status include:

- Available
- Not available
- Not sure

It is worthwhile to note that these are the response parameters, by which port users gave their opinions on the investigative question-‘are the following value-adding services available in the port?’ The value-adding services in question are transport delivery service, warehousing, packaging, technical support, advertisement support, assembly of cargo, consultancy, canteen/catering and water supplies.

### 6.6.1 The Rotterdam and PD Ports’ perspective

Presentation on figure 6.5 is a summary of the availability status of the value-adding services based on the opinions of port users in the Rotterdam (The Netherlands) and PD Teesport (United Kingdom) ports.

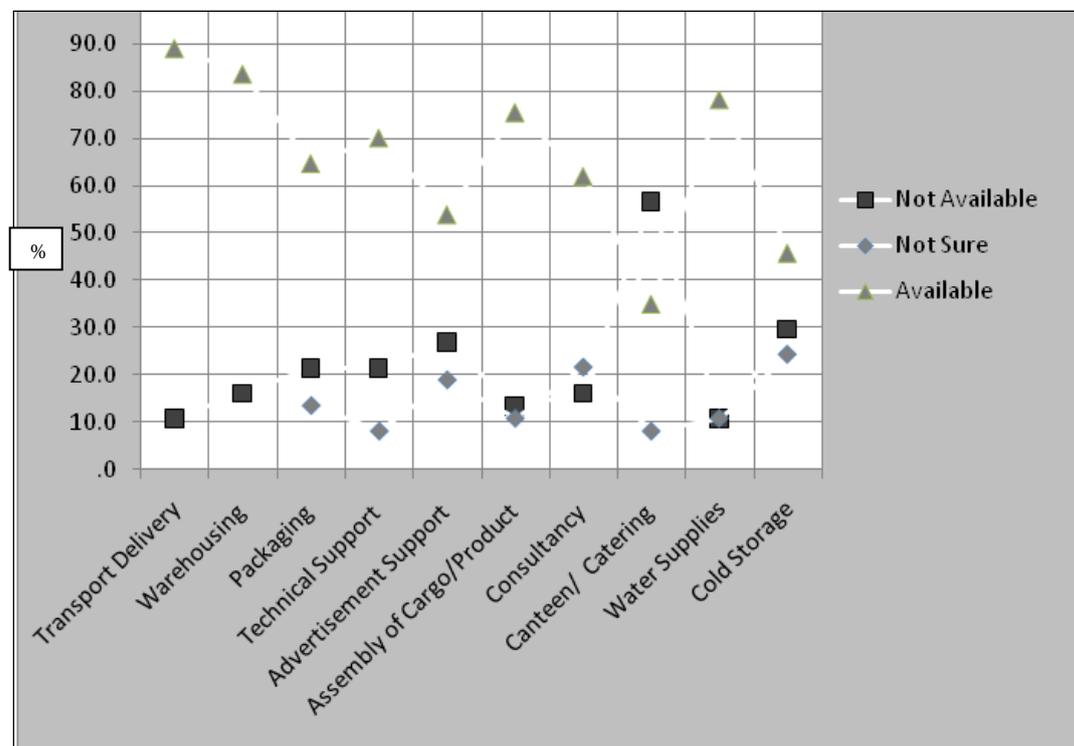


Figure 6.5: Availability of value-adding services (The Rotterdam & PD Ports’ perspective)

An important observation is that while the ‘available’ and ‘not available’ indication icons in figure 6.5 were present for all the value-adding services, the ‘not sure’ indication icons only started from the packaging service column. Thus it implies that all respondents were definitely sure of the availability status of warehousing and transport services.

Except for canteen/catering and cold storage services, other services examined were reported to be available by over 50.0% of the respondents. For instance some services and proportions of port users indicating them to be available include: transport (89.2%); warehousing (83.8%); packaging (64.9%); technical support (70.3%); advertisement support (54.1%); assembly of cargo/product (75.7%); consultancy (62.2%); and water supplies (78.4%).

The table 6.2 complements figure 6.5 in the illustration and presentation of port users' opinion on VAS status in the Rotterdam and PD ports.

Table 6.2: Availability of value-adding services (The Rotterdam & PD Ports)

%	Transport Delivery	Ware-Housing	Pack-aging	Technical Support	Adverti- sement Support	Assembly of Cargo/ Product	Consul- tancy	Canteen/ Catering	Water Supplies	Cold Storage
Available	89.2	83.8	64.9	70.3	54.1	75.7	62.2	35.1	78.4	45.9
Not Available	10.8	16.2	21.6	21.6	27.0	13.5	16.2	56.8	10.8	29.7
Not Sure			13.5	8.1	18.9	10.8	21.6	8.1	10.8	24.3

Although the proportion of port users that considered some of the value-adding services as 'not available' is moderately low, there was rather a high ratio (56.8%) who showed that canteen/catering services are not obtainable in the ports. This level of opinion showed a near overwhelming view of the absence of canteen/catering services in the ports.

## 6.6.2 The Egyptian Port perspective

As a follow-up on this, it was observed as shown in figure 6.6 that five (5) out of the ten (10) value-adding services were indicated to be ‘available’ by over 60% of the respondents. Transport service was declared to be ‘available’ by 82.9% of the port users, while the same declaration was made for warehousing by 85.7% of the respondents.

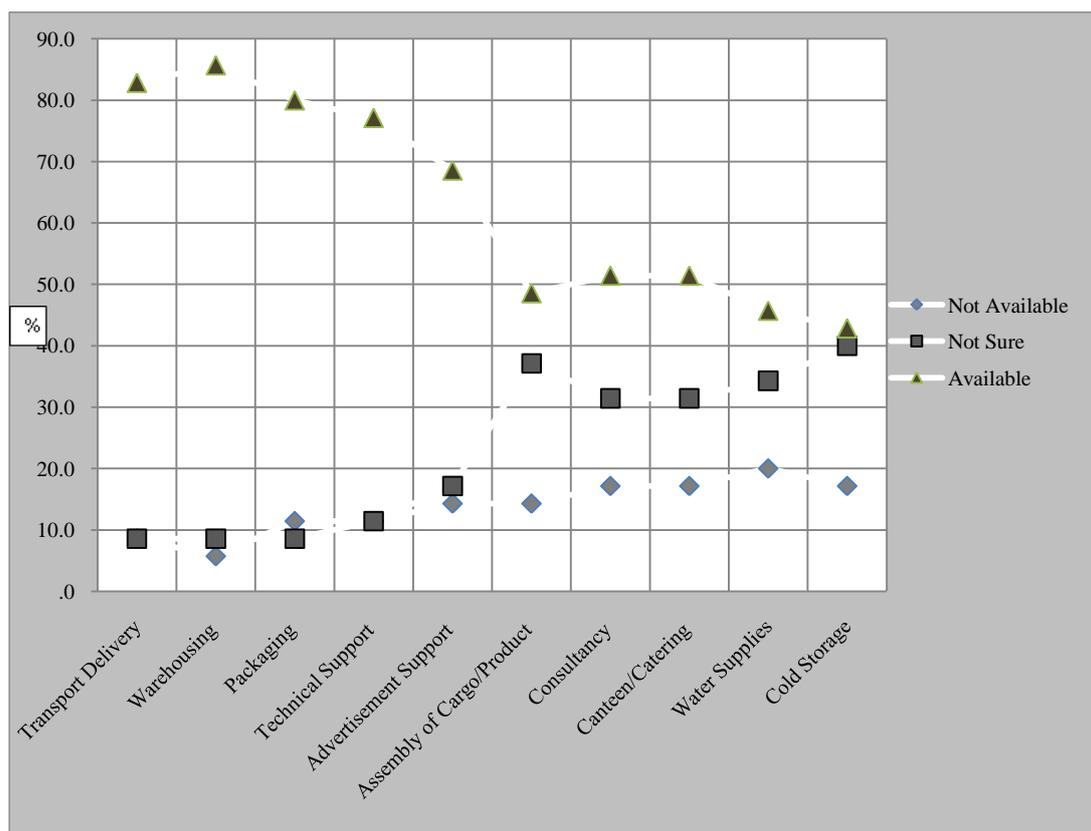


Figure 6.6: Availability of value-adding services (Egyptian Port perspective)

Other tangible indications for service availability by port users were made for packaging (80.0%), technical support (77.1%) and advertisement (68.1%).

Table 6.3: Availability of value-adding services (Egyptian Port perspective)

%	Transport Delivery	Warehousing	Packaging	Technical Support	Advertisement Support	Assembly of Cargo/Product	Consultancy	Canteen/Catering	Water Supplies	Cold Storage
Available	82.9	85.7	80.0	77.1	68.6	48.6	51.4	51.4	45.7	42.9
Not Available	8.6	5.7	11.4	11.4	14.3	14.3	17.1	17.1	20.0	17.1
Not Sure	8.6	8.6	8.6	11.4	17.1	37.1	31.4	31.4	34.3	40.0

The table 6.3 is intended to support information in figure 6.6 for more clarity in presentation of data outcomes.

In a similar trend, though the plots for opinions of ‘not sure’ of service availability was moderately low, it peaked on cold storage; with 40% of the respondents not being definitely sure of the service’s availability in the port. It would be recalled that the ‘not sure’ option in the questionnaire, as elaborated in section 3.3.3 of the methodology chapter 3, was primarily put included in order to avoid any ‘forceful’ response circumstance where there exists scepticism.

### 6.6.3 The Nigerian Port’s perspective

Nigerian port users’ opinions on availability status of value-adding services are illustrated in the figure 6.7.

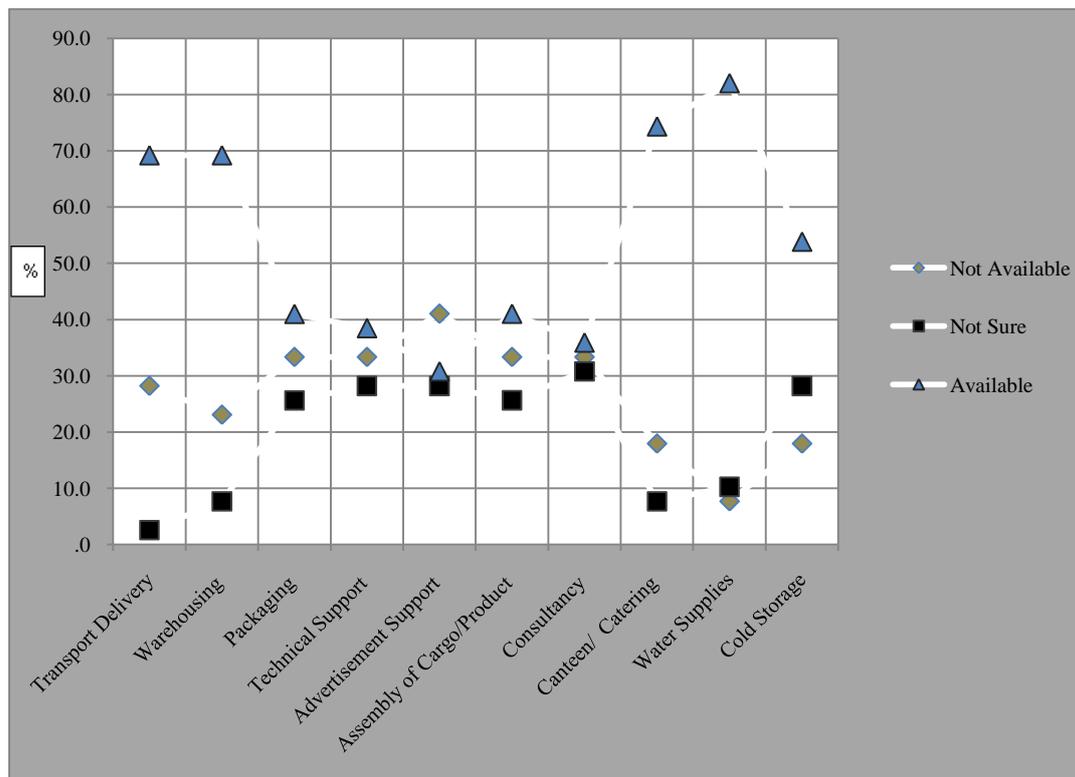


Figure 6.7: Availability status of value-adding services (Nigerian perspective)

As in the previous cases, the figure presents the icon plots of opinions on value-adding services ‘availability’ status, and table 6.4 stands to numerically enhance comprehension of data.

Table 6.4: Availability status of value-adding services (Nigerian perspective)

%	Transport Delivery	Warehousing	Packaging	Technical Support	Advertisement Support	Assembly of Cargo/Product	Consultancy	Canteen/Catering	Water Supplies	Cold Storage
Available	69.2	69.2	41.0	38.5	30.8	41.0	35.9	74.4	82.1	53.8
Not Available	28.2	23.1	33.3	33.3	41.0	33.3	33.3	17.9	7.7	17.9
Not Sure	2.6	7.7	25.6	28.2	28.2	25.6	30.8	7.7	10.3	28.2

Water supplies and canteen/catering services received highest availability indications by 82.1% and 74.4% of port users respectively. Other groups of services for which port users indicated high levels of availability include transport (69.2%), warehousing (69.2%) and cold storage services (53.8%).

Advertisement support is shown as the service for which there was the highest indication of non-availability. The trend of outcomes for service availability was observed to be lower in the Nigerian Apapa port in comparison to other ports examined. However, value-adding services were considerably confirmed to be available in the Nigerian port as is the case for other ports.

#### **6.6.4 Synopsis for the availability status of key value-adding services**

Substantially, it might be considered to be the case that the availability or non-availability of value-adding services in a particular port is a reflection of the importance attached to such services in a port's competitive strategies. The purpose of this section is to provide an opportunity for a thorough investigation into the availability status of each of the following value-adding services:

##### **6.6.4 (a) Transport service - availability status**

Findings revealed that transport service is the most available value-adding service. For instance, 82.9% of respondents in Damietta Egyptian port and 69.2% of those in Nigerian Apapa port indicated that transport service is available. Thus, it can be said

that the availability of transport service was indicated by many port users in the Egyptian Damietta port than is the case in the Nigerian Apapa port. However, on a general note, findings showed that for these ports situated in the developing economies, transport service is one of the readily available types of value-adding services.

As concerned with the ports located in the developed economies of The Netherlands (Rotterdam) and United Kingdom (PD Teesport), 89.2% of the respondents affirmed that transport delivery service is available in the ports. Another point of interest is that no port user opted for the 'not sure' of availability opinion for transport service. This manner of availability attestation, consequently translates to transport service being established and readily available in the ports in developed economies.

Transport service, as herein discussed is essentially concerned with the movement of export/import goods to and fro the ports by direct port service provision or made possible through 3PLs services.

#### **6.6.4 (b) Warehousing service - availability status**

In the Egyptian Damietta port, 85.75% of the port users signified that warehousing service is available in the port. The significance of this proportion is outstanding, thereby resulting in a very negligible percentage of respondents who opted for the 'not sure' or 'not available' opinions. For the Nigerian Apapa port, 69.2% of respondents held that warehousing service is available in the port. The ongoing therefore, points to an important piece of information that warehousing services is one of the predominantly affirmed services obtainable in the developing economies' ports.

Investigation on The Netherlands Rotterdam and United Kingdom PD Teesport ports showed that 83.8% of respondents affirmed the availability of warehousing services in the ports. Again, this symbolizes an outstanding standpoint to the availability of warehousing services in the developed economies ports. In addition, it is also worthy of note that as is the case for transport service, warehousing is another service for which there was no 'not sure' opinion from any of the port users in the developed economies ports.

#### **6.6.4 (c) Packaging service - availability status**

Of all respondents from the Damietta port in Egypt, 80.0% upheld that packaging service is obtainable in the port. On the other hand, data from the Nigerian port users showed that 41.0% of respondents stated that packaging is available.

Whereas 21.6% of respondents were of the view that packaging service is 'not available' in the Rotterdam and PD Teesport ports, the most significant aspect of the outcome is that 64.9% of the respondents indicated that the service does exist and is available in the ports.

On the above premises, it is acknowledged that packaging service's availability is stronger in the Egyptian Damietta port given a very high proportion of port users' affirmation. Although packaging service companies have been described as being of less power in supply chain partnerships (Gattorna, 2003), many contemporary logistical operations can hardly be effectively carried out if standardized packaging is not available.

#### **6.6.4 (d) Technical Support - availability status**

In the Damietta port, 77.1% of respondents confirmed availability of technical support and 38.5% of those in Nigerian Apapa port were of the same opinion. Although, the service is established, its offering appears to be more pronounced in the Egyptian port than in the Nigerian port.

Technical support service availability was confirmed by 70.0% of the respondents from the Rotterdam and PD Teesport ports. On an average comparison, it could be said that these outcomes point to an indication that the availability of technical support service is well known in the ports of the developed economies and Damietta port with a lesser availability in the Apapa port.

#### **6.6.4 (e) Advertisement Support - availability status**

Advertisement support is held to be available by 68.6% of the port-user respondents from the Damietta Egyptian port. For their Nigerian counterparts, 30.8% also considered the service as being 'available'. In the Nigerian case however, it was found that a higher proportion of port users represented by 41.0% of its total respondents were of the opinion that advertisement support is 'not available', while 28.2% of the respondents opted for the 'not sure' opinion. Based on the information provided, it can be stated that advertisement support exists in the Egyptian port; whereas such level of certainty does not exist in the Nigerian port.

In the Rotterdam and PD Teesport ports, it was observed that 54.1% of the respondents were of the opinion that the service is 'available'. Although the proportion of respondents who made this judgement on the availability of advertisement support is not very high as is the case in some other services, it does represent a substantial evidence to show service availability.

A meaningful insight on the availability of advertisement support service, both from the literature (ABP, 2007; PD Teesport and Hartlepool, 2008), and as commented by port users is that the service particularly takes the form of ports' involvement in publicising port users' services in the port's brochures and publications, and hence supporting in advertising port users' businesses.

#### **6.6.4 (e)\* Advertisement support proposal**

This study hereby put forward a proposal for the possibility of ports developing another form of advertisement support service which shall be made available as a value-adding service for the mutual strategic benefits of ports and port users. The possibility of this addition and re-shaping of advertisement support is the reason for the service's different form in the model as presented in section 2.9.

Smuggling of goods into countries has increasingly become a global problem with multi-faceted consequences. One of the negative consequences brought about by the

smuggling menace is a wide scepticism from end-user customers on whether goods/products in the market are authentic and from ethical sources. Admittedly, building trust as opposed to any doubtful signals to customers is fundamental to meaningful sales of goods and services.

Advertisement support service proposal is birthed on the platform of building the trust of customers in order to bridge the scepticism gap brought about by the smuggling of goods into countries. As a possible solution, a port can develop an advertisement support that regularly authenticates the goods of its port users as having undergone due processes of importation clearance. It is strongly believed that such well articulated practice can indeed provide meaningful support in publicising the genuineness of port users' goods in regards to being 'smuggle-free'. This will undoubtedly go a long way in building customers' trust and by so doing boost the services and businesses of the port-user companies. 'When consumers know that something is authentic, they attach more esteem to that product or brand' (Zikmund and Babin, 2007, pg 139).

This proposal is presented to promote sound and reasoned dialogue among practitioners in the port industry to explore opportunities in developing services that would uniquely advertise the goods and services of port users.

#### **6.6.4(f) Assembly of Cargo/product - availability status**

The availability status of assembly of cargo/product as examined showed that 48.6% of the Egyptian port's respondents were of the opinion that the service is available in the port. Findings from the Nigerian Apapa port showed that 41.0% of the respondents were of the view that assembly of cargo/product service exist in the port. As such the availability of the service in both ports is considered to be established.

While it is acknowledged that assembly of cargo/product service exists in the case studies ports in developing economies, it is observed that affirmation of the service availability in the ports is not comparatively very strong.

In The Netherlands' Rotterdam and United Kingdom's PD Teesport ports, it was affirmed by 75.7% of the port users that the assembly of cargo/product service is available in the ports. With this being the most remarkable opinion on the availability of service status, the existence of assembly of cargo/product service in the developed economies' case study port is therefore established.

#### **6.6.4 (g) Consultancy - availability status**

Correspondingly, it was the viewpoint of 51.4% and 35.9% of port-user respondents respectively in Damietta port and Apapa port, that consultancy service is available in the ports. Given these results, it is considered to be the case that consultancy service exists in both ports in the developing economies.

Analysis of the availability status of consultancy service in the ports of the developed economies of The Netherlands and United Kingdom showed that 62.2% of respondents from the ports were of the view that the service exists in the ports.

#### **6.6.4 (h) Canteen/Catering - availability status**

While 51.4% of the respondents from the Egyptian Damietta port stated that canteen/catering service is available in the port, an overwhelming 74.4% of those from the Nigerian Apapa port have the same opinion. By implication therefore, the availability of canteen/catering service in the developing economies is confirmed with a pronounced presence in the Nigerian Apapa port.

Findings showed that among all the services examined, canteen/catering service is declared as being unavailable by most port users in Rotterdam and PD Teesport ports. This forms the view of 56.8% of the respondents.

While there was a higher opinion of the availability of canteen/catering service in the ports situated in developing economies, for ports in the developed economies, observation showed that there was a lesser confirmation of the availability of the service.

#### **6.6.4 (i) Water supplies - availability status**

Of all the port-user respondents from Damietta port, 45.7% were of the opinion that water supplies service is available. For the Nigerian port, water supplies service received availability acknowledgement more than any other value-adding services in this study. This view was founded on the position of 82.1% of the port users that water supplies service is available in the Apapa port. Consequently, the existence of water supplies as a value-adding service in both developing economies' ports was confirmed, with the confirmation being outstanding in the Apapa Nigerian port.

For The Netherlands Rotterdam port and the United Kingdom PD Teesport port (see figure 6.5 and table 6.2), it is shown that a significant proportion of port users represented by 78.4% of the total respondents, declared that water supplies service is available in the ports. As such, opinions of 'not available' and 'not sure' were considered to be negligible. On this basis, it was established that water supplies service is available in the ports.

Water supply as herein discussed is fundamentally concerned with the provision of fresh water for the use of ships, crew and other port users.

#### **6.6.4 (j) Cold storage - availability status**

In the Damietta port, while 42.9% of respondents affirmed the availability of cold storage service. For the Nigerian port, 53.8% of respondents signified that cold storage service is available in the port. Inquiry into cold storage availability status in The Netherlands Rotterdam and the United Kingdom PD Teesport ports revealed that 45.9% of the respondents declared that the service is available in the ports.

Thus, the service is concluded to be available in all the case study ports. For the developing economies ports, examinations showed that the service is stronger in the Nigerian Apapa port. Although the cold storage service exists in the developed economies ports, opinions for the service availability are more remarkable for ports in the developing economies.

### **6.6.5 Summary - value-adding services availability**

Findings in this section showed that in both the developing and developed economies ports, value-adding services are available. In the developing economies ports, the services adjudged to be available by most users in Damietta port and Apapa port are respectively warehousing and water supplies services. For the developed economies ports (Rotterdam and PD Teesport ports), the service signified to be available by majority of port users is transport service. In overall terms, results showed that the most available service among the ten identified key value-adding services is transport service, followed by warehousing, water supplies and technical support.

## 6.7 Importance of Value-adding Services

This section is concerned with examining the intrinsic importance of value-adding services in ports, particularly as ranked by port users. Table 6.5 presents the summary of all respondents' ranking of the ten (10) understudied value-adding services in accordance with the perceived importance of each service. This gives an overall indication of the importance of the services as ranked by all surveyed port users before commencing analysis on case study basis. In order to maintain consistency in the evaluation of service ranking, only the combinations of 'high' and 'very high' ('high importance') opinions are considered.

Table 6.5: Importance of Value-adding Services: Overall Statistics

Value-adding Services			Port Users' Ranking (Combination of 'High + Very High' Importance Rankings)
	Frequency	N	Percentage (%)
Importance to Port Users: Transport Delivery Services	96	111	86.5%
Importance to Port Users: Warehousing Services	82	111	73.8 %
Importance to Port Users: Water Supplies Services	76	111	68.4%
Importance to Port Users: Technical Support Services	68	111	61.2%
Importance to Port Users: Packaging Services	62	111	55.8%
Importance to Port Users: Assembly of Cargo/Product Services	57	111	51.3%
Importance to Port Users: Cold Store Services	54	111	48.6 %
Importance to Port Users: Consultancy Services	53	111	47.7%
Importance to Port Users: Advertisement Support Services	53	111	47.7%
Importance to Port Users: Canteen/Catering Services	50	111	45.0%
Total	111	111	100%

For transport delivery service, table 6.5 showed that 86.5% of all the port users rated the service as one of 'high importance' and it stands to have received the highest

ranking amongst all the listed value-adding services. This outcome suggests that of all the ten (10) key value-adding services, transport service is the most important service to port users.

In order of importance, other value-adding services that had high rankings and the proportion of port users whose opinions support the assertion are; warehousing (73.8%), water supplies (68.4%) and technical support (61.4%). It is actually a remarkable observation that water supplies emerged in the third top position in the ladder of importance among the key value-adding services.

On the other hand, with ranking by 45.0% of the port users, canteen/catering emerged to be the least relevant service amongst all the ten (10) key value-adding services. Other services that had lower importance rankings by port users include advertisement support (47.7%), consultancy (47.7%) and cold storage services (48.6%).

The acknowledgement that advertisement support service was ranked as one of the least important services signifies that the service is not presently considered to be so crucial in port users' businesses. This re-emphasizes the need to investigate the potential of an aspect of advertisement proposal put forward in the study (see section 6.6.4 (e)\*), which is primarily focused on contributing to solving a long known challenge. This might enhance the importance of advertisement support service to port users operations.

### **6.7.1 Importance of value-adding services based on case study ports**

This section is dedicated to presenting and analysing port users' opinions on the importance of value-adding services, which were discussed on the basis of observable trends in the case study ports. As a general guide, analysis of importance shall be based on the following:

- 'very high' (opinions)
- 'very low'
- 'moderate'
- 'low'
- 'high'
- 'very high' + 'high' = 'high-importance'
- 'very low' + 'low' = 'low-importance' (opinions)

[Note: The above are keys necessary to understand the pattern of analyses and discussions of opinions that follow. Attention is drawn to the fact that the combination(s) of keys chosen in the analysis of a particular variable(s) will depend on significant trends in the outcomes of the variable(s)].

### 6.7.2 Importance of Value-adding services - Rotterdam & PD Ports perspective

An examination of the opinions of port users from Rotterdam and PD Teesport ports revealed that of the ten (10) value-adding services, there are some services that substantially received ranking of ‘very high’ importance. Figure 6.8 and table 6.6 both serve to present outcomes from the analysed data.

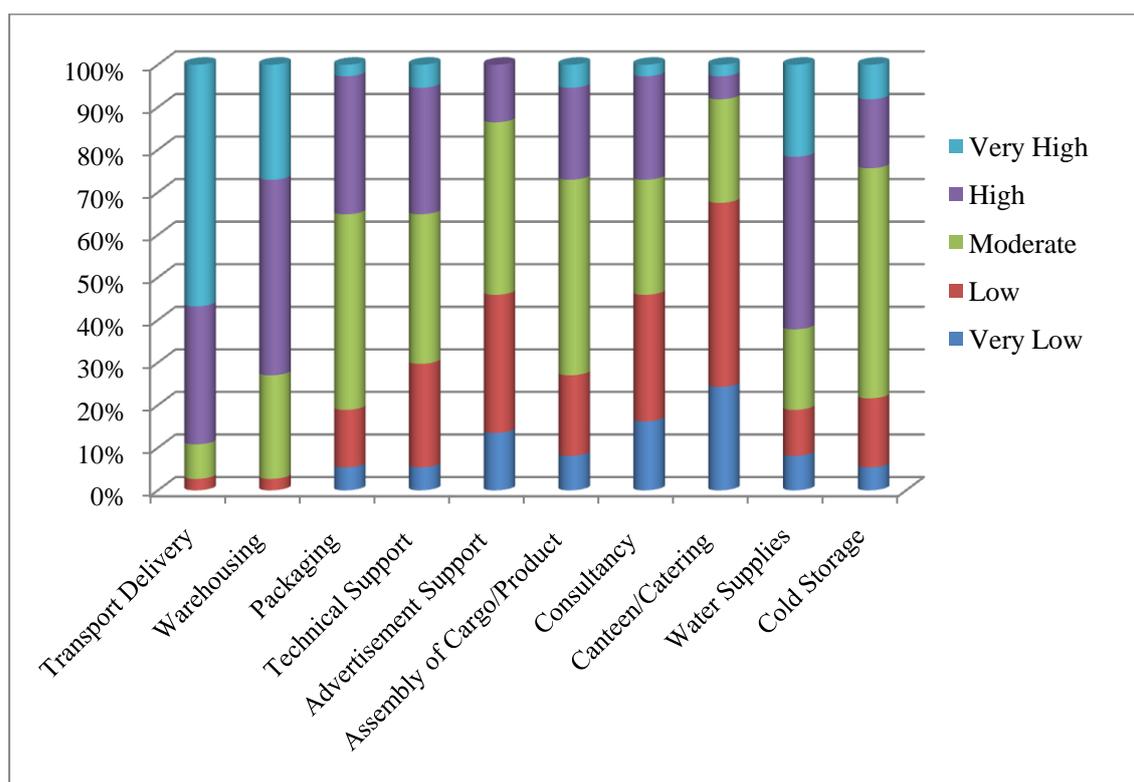


Figure 6.8: Importance of Value-adding services (Rotterdam and PD Ports' perspective)

Transport service was ranked to be of ‘high-importance’ by 89.2% of respondents, whereas warehousing and water supplies services received the same level of ranking respectively by 72.9% and 62.1% of respondents. Developments in this line of higher ratings serve to reiterate the substantial importance of these three value-adding services to port users in the developed economies ports.

Table 6. 6: Importance of Value-adding services (Rotterdam & PD Ports' perspective)

%	Transport Delivery	Warehousing	Packaging	Technical Support	Advertisement Support	Assembly of Cargo/Product	Consultancy	Canteen/Catering	Water Supplies	Cold Storage
Very Low			5.4	5.4	13.5	8.1	16.2	24.3	8.1	5.4
Low	2.7	2.7	13.5	24.3	32.4	18.9	29.7	43.2	10.8	16.2
Moderate	8.1	24.3	45.9	35.1	40.5	45.9	27.0	24.3	18.9	54.1
High	32.4	45.9	32.4	29.7	13.5	21.6	24.3	5.4	40.5	16.2
Very High	56.8	27.0	2.7	5.4		5.4	2.7	2.7	21.6	8.1

Results of ‘low-importance’ (i.e. combination of ‘low’ and ‘very low’ opinions) rankings by 67.5% of respondents showed canteen/catering service as the least important service of all the ten (10) value-adding services. The other service that follows as the next least relevant service is advertisement support with ‘low’ importance opinion by 32.4% of the respondents.

### 6.7.3 Importance of value-adding services- Damietta Port perspective

In order to create synergies, figure 6.9 and table 6.7 are used to enhance understanding of findings from Egyptian port users concerning the importance of value-adding services.

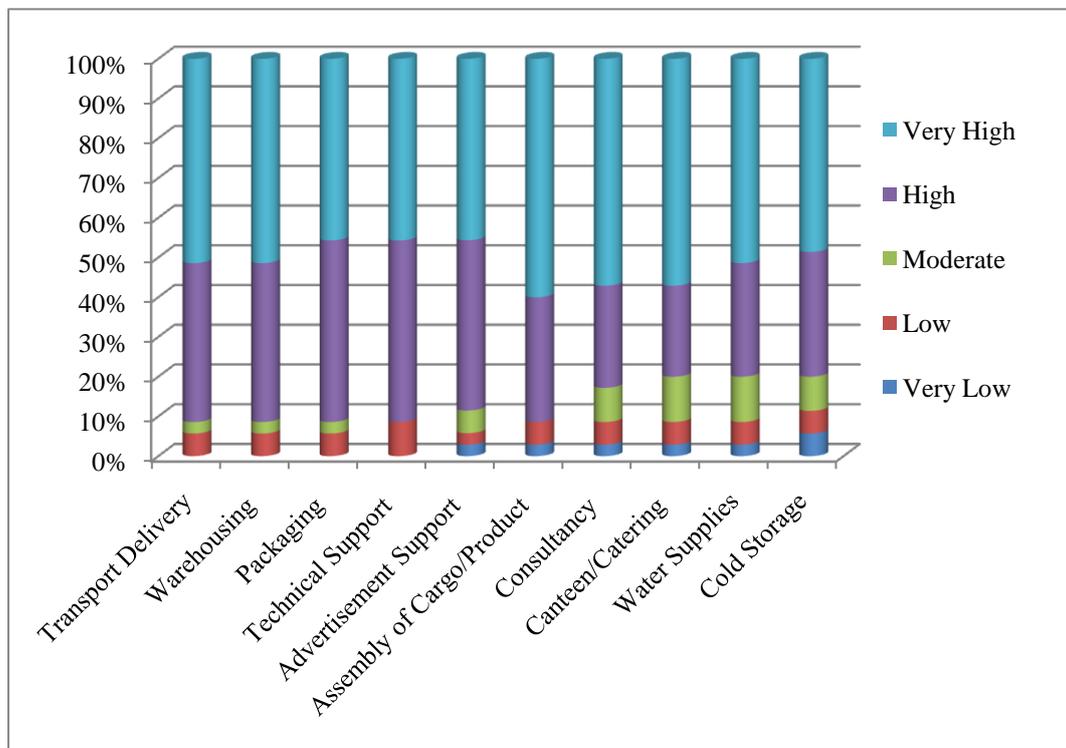


Figure 6.9: Importance of Value-adding services (Egyptian Port perspective)

Some services that received outstanding rankings of ‘high-importance’ (i.e. combination of ‘high and very high’ opinions) and the proportions of port users who gave their opinions to this effect include transport (91.4%), warehousing (91.4%), technical support (91.4%) and assembly of cargo/products (91.4%).

Table 6.7: Importance of Value-adding services (Egyptian Port perspective)

%	Transport Delivery	Warehousing	Packaging	Technical Support	Advertisement Support	Assembly of Cargo/Product	Consultancy	Canteen/Catering	Water Supplies	Cold Storage
Very Low					2.9	2.9	2.9	2.9	2.9	5.7
Low	5.7	5.7	5.7	8.6	2.9	5.7	5.7	5.7	5.7	5.7
Moderate	2.9	2.9	2.9		5.7		8.6	<b>11.4</b>	<b>11.4</b>	8.6
High	<b>40</b>	<b>40</b>	<b>45.7</b>	<b>45.7</b>	<b>42.9</b>	<b>31.4</b>	<b>25.7</b>	<b>22.9</b>	<b>28.6</b>	<b>31.4</b>
Very High	<b>51.4</b>	<b>51.4</b>	<b>45.7</b>	<b>45.7</b>	<b>45.7</b>	<b>60</b>	<b>57.1</b>	<b>57.1</b>	<b>51.4</b>	<b>48.6</b>

Based on significant ‘high-importance’ rankings, other services that are worth enlisting for top importance include advertisement support, consultancy, water supplies, canteen/catering and cold storage. This assertion is based on the following ‘high-importance’ rankings for advertisement support (88.6%), consultancy (82.8%), water supplies (80.0%), canteen/catering (80.0%) and cold storage (80.0%).

It is remarkable however to observe that on significant terms, the Damietta Egyptian port users did not rank any of the ten (10) key value-adding service as being of ‘very low’ importance.

### 6.7.4 Importance of Value-adding services – Apapa Nigerian Port’s perspective

With regard to the Apapa Nigerian port, respondents significantly ranked transport service, warehousing, technical support and water supplies as being ‘very high’ in importance, indicating that these particular services are relevant to the businesses of the port users.

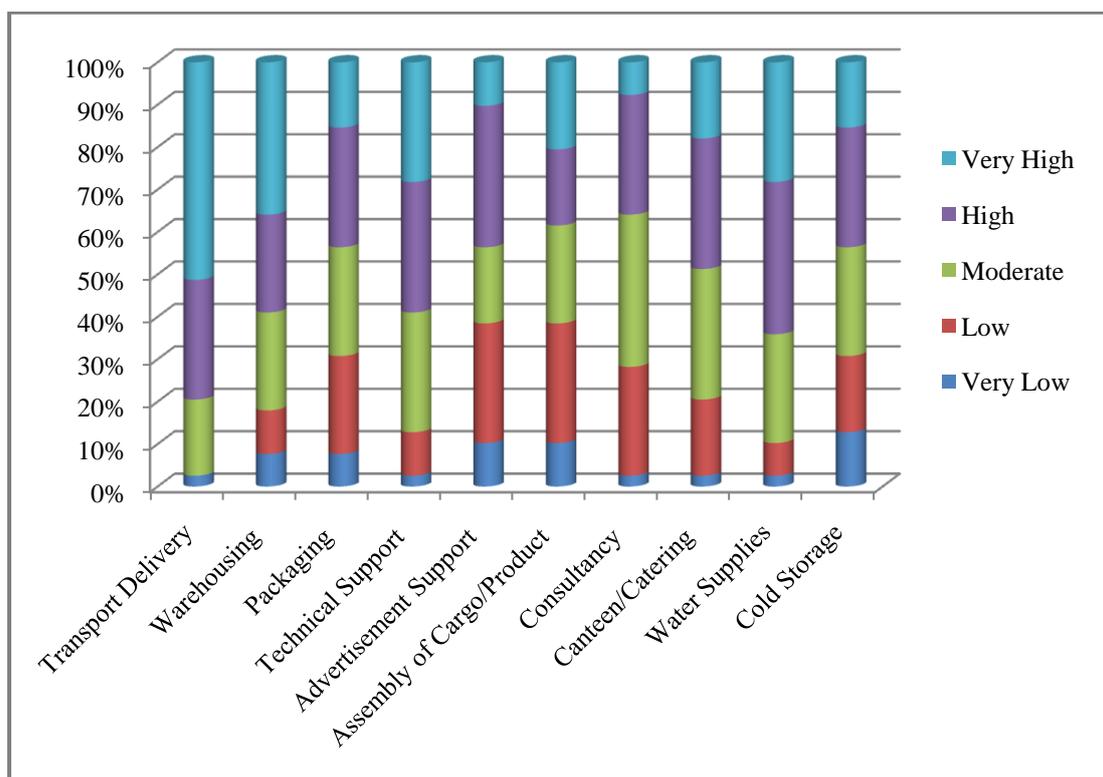


Figure 6.10: Importance of value-adding services (Nigerian Port’s perspective)

In this manner, presentation of figure 6.10 and table 6.8 shows outcomes on services’ importance ranking.

Table 6.8: Importance of value-adding services (Nigerian Port’s perspective)

%	Transport Delivery	Warehousing	Packaging	Technical Support	Advertisement Support	Assembly of Cargo/Product	Consultancy	Canteen/Catering	Water Supplies	Cold Storage
Very Low	2.6	7.7	7.7	2.6	10.3	10.3	2.6	2.6	2.6	12.8
Low	0.0	10.3	23.1	10.3	28.2	28.2	25.6	17.9	7.7	17.9
Moderate	17.9	23.1	25.6	28.2	17.9	23.1	35.9	30.8	25.6	25.6
High	28.2	23.1	28.2	30.8	33.3	17.9	28.2	30.8	35.9	28.2
Very High	51.3	35.9	15.4	28.2	10.3	20.5	7.7	17.9	28.2	15.4

By the combination of ‘high’ and ‘very high’ importance opinions (i.e. ‘high-importance’), the proportions of respondents who made rankings of ‘high-importance’ and the corresponding services include transport service (79.5%), warehousing (59.0%), technical support (59.0%) and water supplies (64.1%). Interpretation of these results points to the understanding that these services are in actual fact held in high regards by the port users in the Nigerian Apapa port.

Substantially, no service was particularly ranked to be of very low importance. However of the ten value-adding services understudied, advertisement support, assembly of cargo/product and consultancy were found in the lower part of the ladder of importance for port users in Apapa port.

### **6.7.5 Synopsis on importance of value-adding services**

#### **6.7.5 (a) Transport service – Importance**

Of all the ten value-adding services investigated, transport service was ranked as the most important by an overwhelming proportion of port users in the Egyptian Damietta port, with 91.4% of the respondents giving a ranking of ‘high-importance’. Amongst the Nigerian port users in Apapa port, it was also established by the rating of 79.5% of respondents that transport service is the most important of all the considered value-adding services. By implication therefore, transport service is a value-adding service held in high esteem by port users in the developing economies.

In the developed economies ports of Rotterdam and PD Teesport, findings showed that 89.2% of port-user respondents indicated that transport service is of ‘high-importance’ to their businesses.

The trends for importance-ratings of transport service by port users in all the case study ports are remarkably significant. This is supported by the observations of Martino and Morvillo (2008) that transport service is one of the traditional support services offered in ports. Consequently, transport service is an exceptionally important value-adding service for port users businesses.

### **6.7.5 (b) Warehousing service – Importance**

Damietta port respondents in the proportion of 91.4% ranked warehousing value-adding service to be of ‘high-importance’. On the other hand, the service received a 59.0% grading of ‘high-importance’ by port-user respondents in the Nigerian Apapa port. While the service was considered important for port users in these developing economies ports, this is particularly the case for those in Egypt. Warehousing service was ranked to be of ‘high-importance’ by 72.9% of the respondents from Rotterdam and the PD Teesport ports.

### **6.7.5 (c) Packaging service – Importance**

Packaging services also emerged as very important for port users in the Egyptian Damietta port, given that 91.4% of the respondents confirmed that the service is of ‘high-importance’ to their businesses. Also, for the Nigerian Apapa port users, the most significant outcome is that 43.6% of the respondents were of the opinion that packaging service is of ‘high-importance’.

Survey results from the Rotterdam and PD Teesport ports showed that while it is the view of 35.1% of the port-users that packaging service is of ‘high-importance’, a greater proportion (45.9%) considered the service to be of ‘moderate’ importance.

Putting all outcomes in perspective therefore, it can be observed that packaging service is particularly important to the port users in the Egyptian port, much more than is currently the case in any of the ports surveyed.

### **6.7.5 (d) Technical Support- importance**

Technical support service was ranked to be of ‘high-importance’ by 91.4% of the respondents from the Damietta port, while 59.0% of those from Nigerian Apapa port gave the same opinion. Thus, in the ports of developing economies, importance of the service appears to be more pronounced among the Egyptian port users.

For ports in the developed economies, it was observed that 35.1% of the port-user respondents were of the view that technical support is of ‘high-importance’. It is pertinent to note that another 35.1% of the port users were of the opinion that the service is of ‘moderate’ importance.

#### **6.7.5 (e) Advertisement Support – importance**

Advertisement support was substantially held as being of ‘high-importance’ particularly by port users from the Damietta port represented by 88.6% of the respondents. Results from the Nigerian Apapa port showed that 43.6% of the respondents ranked the service to be of ‘high-importance’. Only a mere 13.5% of respondents from the developed economies ports gave the service a ranking of ‘high-importance, indicating a greater tilt towards ‘moderate and low’ importance.

Inferentially, more exploration of ways to enhance the beneficial impact of advertisement support is crucial.

#### **6.7.5 (f) Assembly of cargo/product – importance**

While 91.4% of the respondents from Damietta port stated that assembly of cargo/product is of ‘high-importance’ only 38.4% of those in Apapa port ranked the service as such. A closer observation provides a compelling pointer that assembly of cargo is the most important in Damietta port, given that it received the highest ranking of being ‘very high’ in importance by 60% of port users. Similarly, 37.0% of respondents from Rotterdam and PD Tees ports ranked assembly of cargo/products as being of ‘high-importance’, with a greater proportion opting for ‘moderate’ importance level.

#### **6.7.5 (g) Consultancy – importance**

For Damietta port users, 82.8% of them (respondents) ranked consultancy at a ‘high-importance’ level. This showed that the service is held in high esteem by port users in the port. 43.6% of port users in the Apapa port also classified consultancy service to be of the same level of importance. With the case study ports in the developed economies, it was the opinion of 45.9% of the respondents that consultancy is of ‘low-importance’ (i.e. combination of low and very low opinions), while the service is considered as being of ‘high-importance’ by 27.0% the respondents.

#### **6.7.5 (h) Canteen/Catering - importance**

Results showed that whereas 80.0% of respondents from the Egyptian Damietta port ranked canteen/catering service to be of ‘high-importance’, the service received the same level of ranking by 48.7% from Apapa port’s respondents. For ports in the developed economies, the significant outcome is that 67.5% of the port users viewed the canteen/catering service as being of ‘low-importance’.

Summarily, these outcomes showed that while canteen/catering service is considered important in the ports of the developing economies, its relevance for the port users in the ports of the developed economies is much lower.

#### **6.7.5 (i) Water supplies - importance**

The importance of water supplies received overall high rankings by considerable proportions of port users in all the understudied ports. Of the Damietta port-user respondents, 80.0% gave the ranking of ‘high-importance’ to water supplies and 64.1% of their Apapa counterparts held the same view. In a similar fashion, 62.1% of respondents from the developed economies ports were also of the opinion that water supplies service is of ‘high-importance’.

Ships calling to various port locations are continually in need of constant supply of fresh water, which can be arranged for through a branch of the shipping line in the destination country, their agents or provided by the port of call. As a result, water supplies service is one of the established support services rendered in ports. The increase in the kinds of contemporary port users, undoubtedly mean more demand for water supplies within and around ports. Thus, the importance of water supplies in ports is pressing.

#### **6.7.5 (j) Cold storage - importance**

Cold storage was considered to be of ‘high-importance’ by 80.0% of the respondents in the Damietta Egyptian port, while 43.6% of Nigerian Apapa port respondents gave a similar importance-ranking. There was tilt in opinions of port users in developed economies, as the major outcome was that 54.1% of the respondents consider cold storage as being of ‘moderate’ importance. It is expected that increase in the varieties of materials and products shipped around the world, as warranted by globalisation of trade, would mean a corresponding rise in the volume of cargo shipping and port-based operations that require cold storage for preservation.

#### **6.7.6 Summary - value-adding services - importance**

Admittedly, understanding the extent of importance customers attach to a given service is resourceful information for the strategic positioning and re-positioning of any customer-focused business. In the same vein, acquisition of knowledge on the importance of different value-adding services to port users becomes crucial in the formulation of a port’s strategy. Findings showed that value-adding services in ports are important for ports and port users businesses. Everyone of the ten identified key value-adding service received some extent of importance ranking.

While closer observation showed that assembly of cargo/product is the most important service for Egyptian Damietta port users, findings revealed water supplies to be the most important for the Nigerian Apapa port users. Transport service emerged as the most important for port users of Rotterdam and PD Teesport ports, whereas canteen/catering service received ranking as the least important of the ten key value-adding services in these developed economy ports. Overall for the four case study ports, transport service emerged to be the most important, followed by warehousing, water supplies and technical support.

## 6.8 Potential usage of value-adding services

In table 6.9, a summary of the opinions of all respondents from the four case study ports is presented as concerning the likelihood of using some of the value-adding services which are understudied in this research project.

Table 6.9: Value-adding services Likely Usage: Overall Statistics

Value-adding Services			Port Users' Ranking (Combination of 'High + Very High' Usage Rates)
	Frequency	N	Percentage (%)
Likely Usage Rate: Transport Delivery Services	64	111	57.6%
Likely Usage Rate: Warehousing Services	60	111	54.0%
Likely Usage Rate: Technical Support Services	56	111	50.4%
Likely Usage Rate: Water Supplies Services	41	111	36.9%
Likely Usage Rate: Assembly of Cargo/Product Services	41	111	36.9%
Likely Usage Rate: Packaging Services	40	111	36.0%
Likely Usage Rate: Advertisement Support Services	40	111	36.0%
Likely Usage Rate: Canteen/Catering Services	34	111	30.6%
Likely Usage Rate: Cold Storage Services	29	111	26.1%
Likely Usage Rate: Consultancy Services	28	111	25.2%

Noteworthy trends for value-adding services listed in table 6.9 include observation that 57.6% and 54.0% proportions of port users respectively showed interest in potentially using transport and warehousing services at 'high-usage' (combination of 'high and very high' opinions) levels. These indications are higher than as is the case for other services. By implication therefore, these services are the most desired of all the value-adding services investigated. With 50.4% of port users who showed interest, technical support service emerged as the next in line of services with high-usage potential.

On the other hand, cold storage and consultancy services generally received lower usage indications, respectively having 26.1% and 25.2% of port users put forward possible high-usage opinions. This means that port users' desires to use value-adding services are weaker for cold storage and consultancy services.

### 6.8.1 Potential usage of value-adding services based on case study ports

Since value-adding services are not the core services of ports, an understanding of the demand for such services therefore become even more important in order to enable informed consideration in port's strategy formulation. The potential usage of the value-adding services examined in this study is presented on port by port basis.

### 6.8.2 The Rotterdam and PD Ports' perspective

For potential usage of the ten (10) identified key value-adding services, figure 6.11 and table 6.10 are used complementarily to present the opinions of port-user respondents from Rotterdam and PD ports.

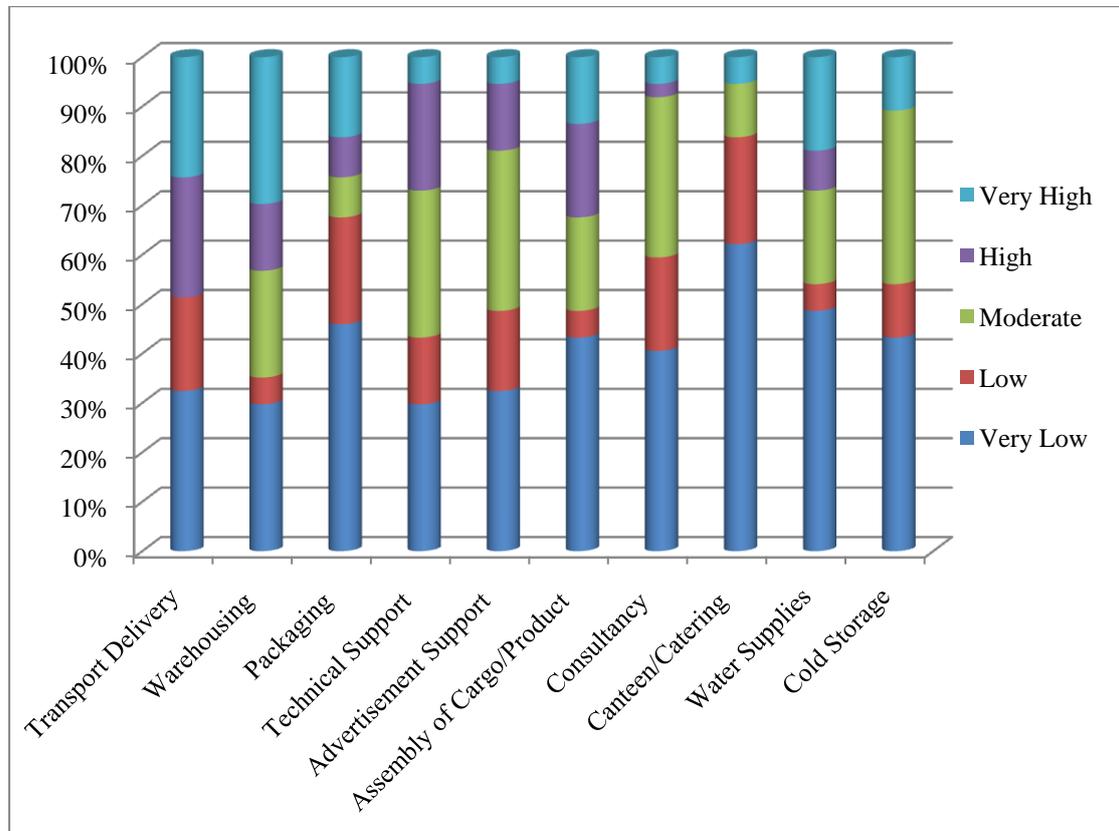


Figure 6.11: Potential usage of value-adding services (Rotterdam & PD ports)

While there is a level of desire to use value-adding services, indications for potential usage of most services are low among Rotterdam and PD Teesport ports users.

Table 6.10: Potential usage of value-adding services (Rotterdam & PD ports)

%	Transport Delivery	Warehousing	Packaging	Technical Support	Advertisement Support	Assembly of Cargo/Product	Consultancy	Canteen/Catering	Water Supplies	Cold Storage
Very Low	32.4	29.7	45.9	29.7	32.4	43.2	40.5	62.1	48.6	43.2
Low	18.9	5.4	21.6	13.5	16.2	5.4	18.9	21.6	5.4	10.8
Moderate		21.6	8.1	29.7	32.4	18.9	32.4	10.8	18.9	35.1
High	24.3	13.5	8.1	21.6	13.5	18.9	2.7		8.1	
Very High	24.3	29.7	16.2	5.4	5.4	13.5	5.4	5.4	18.9	10.8

In aggregate (i.e. combination of ‘very low’ and ‘low’), 67.5% and 83.7% of port users stated that they have low-usage intentions for packaging and canteen/catering respectively. These viewpoints and other details in the data point to a general tilt away from the desire to use value-adding services among port users in the ports.

Nevertheless, it is very important to emphasise that there were substantial proportions of port users who are enthusiastic about using value-adding services as made available by the ports in the developed economies. This assertion is based on the combined proportion of respondents that jointly showed interest to use value-adding services at ‘moderate’, ‘high’ and ‘very high’ levels. Correspondingly these combined proportions are represented by transport delivery (48.6%), warehousing (64.8%), packaging (32.4%) technical support (56.7%), advertisement support (51.3%), assembly of cargo/products (51.3%), consultancy (40.5%), canteen/catering (16.2%) and water supplies (45.9%) and cold storage (45.9%).

These proportions of port users who jointly put forward some sort of intentions were observed to be mostly above 40.0% for each of the value-adding service. Hence, it is upheld that the desire for value-adding services in the ports situated in the developed economies does still exist.

### 6.8.3 The Egyptian Port perspective

As observed in figure 6.12 below, transport delivery, warehousing, packaging and technical support services are not ranked for 'very high' possible usage rate. However, these services generally received most of the 'high' potential usage rankings when compared to other value-adding services examined based on the opinions of Damietta port users.

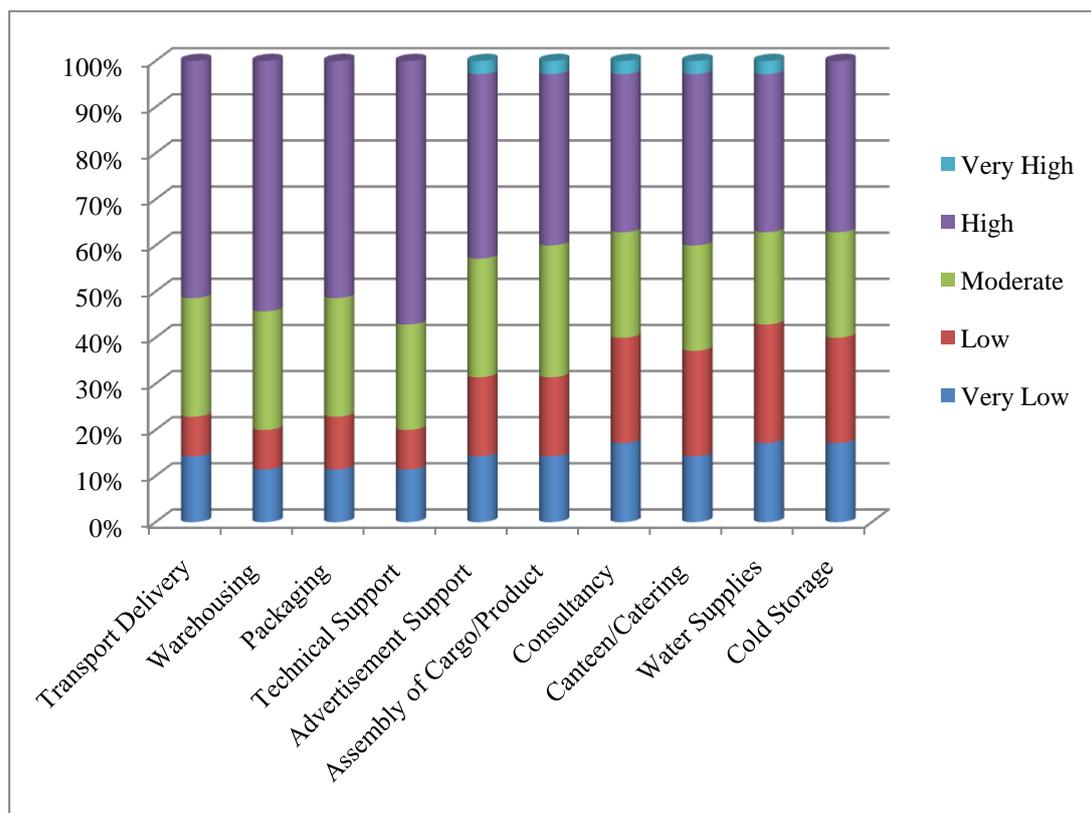


Figure 6.12: Potential usage of value-adding services (Damietta Egyptian Port perspective)

Egyptian port users in the proportions of 51.4%, 54.3%, 51.4% and 57.1%, showed usage interest respectively for transport delivery, warehousing, packaging and technical support services.

The table 6.11 serves to complement figure 6.12 in presenting the opinions of port users on the potential usage of the different value-adding services.

Table 6.11: Value-adding service usage (Egyptian Port perspective)

%	Transport Delivery	Ware-Housing	Pack-aging	Technical Support	Adverti- sement Support	Assembly of Cargo/ Product	Consul- tancy	Canteen/ Catering	Water Supplies	Cold Storage
Very Low	14.3	11.4	11.4	11.4	14.3	14.3	<b>17.1</b>	14.3	<b>17.1</b>	<b>17.1</b>
Low	8.6	8.6	11.4	8.6	17.1	17.1	<b>22.9</b>	22.9	<b>25.7</b>	<b>22.9</b>
Moderate	<b>25.7</b>	<b>25.7</b>	<b>25.7</b>	<b>22.9</b>	<b>25.7</b>	<b>28.6</b>	<b>22.9</b>	<b>22.9</b>	<b>20.0</b>	<b>22.9</b>
High	<b>51.4</b>	<b>54.3</b>	<b>51.4</b>	<b>57.1</b>	<b>40.0</b>	37.1	34.3	37.1	34.3	37.1
Very High					2.9	2.9	2.9	2.9	2.9	

By the aggregation of percentage indications for ‘very low’ and ‘low’ (i.e. low-usage), opinions on the potential usage of some services can be better understood. In this manner, services for low-usage among the Damietta port users are predominantly consultancy, water supplies and cold storage, as correspondingly stated by 40%, 42.8% and 40% of the respondents.

### 6.8.4 The Nigerian port's perspective

As in previous examinations, the table 6.12 below is intended to support information on figure 6.13 for better understanding of the services. Affirmation for the possible use of value-adding services by port users in the Nigerian case study port (Apapa) showed higher usage intentions for most of the services.

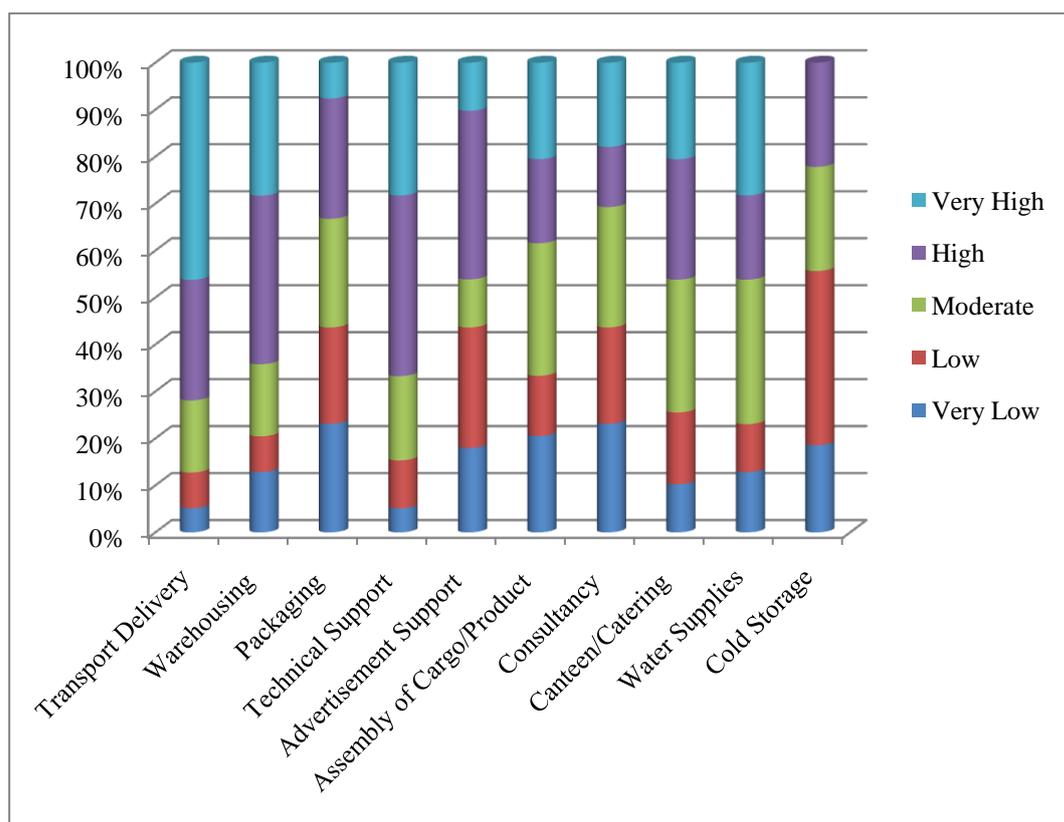


Figure 6.13: Potential usage of value-adding services (Nigerian port's perspective)

The proportions of port users who opted to use the services at 'high' levels are as follows; for warehousing (35.8%), packaging (26.6%), technical support (38.4%), advertisement support (35.8%) and canteen/catering (25.6%). Since these outcomes are only for opinions on 'high' usage intensions, they showed more enthusiasm for value-adding services.

On a 'high-usage' aggregate (i.e. combinations of 'very high' and 'high' opinions) level, it is shown that transport service is the most sought after service with a total of 71.7% port-user respondents putting forward intentions for the service at 'high-usage'

level. A further remarkable revelation is that 46.1% of the Nigerian port users indicated interest to potentially use transport delivery service at a ‘very high’ level.

Table 6.12: Value-adding service usage (Nigerian port’s perspective)

%	Transport Delivery	Warehousing	Packaging	Technical Support	Advertisement Support	Assembly of Cargo/Product	Consultancy	Canteen/Catering	Water Supplies	Cold Storage
Very Low	5.1	12.8	23.1	5.1	17.9	20.5	23.1	10.2	12.8	12.8
Low	7.6	7.6	20.5	10.2	25.6	12.8	20.5	15.3	10.2	25.6
Moderate	15.3	15.3	23.1	17.9	10.2	28.2	25.6	28.2	30.7	15.3
High	25.6	35.8	25.6	38.4	35.8	17.9	12.8	25.6	17.9	15.3
Very High	46.1	28.2	7.6	28.2	10.2	20.5	17.9	20.5	28.2	

Further ‘high-usage’ aggregation (i.e. ‘very high’ and ‘high’), resulted in distinguished outcomes of having 64.0% respondents indicate usage intentions for warehousing, 66.6% for technical support and 46.1% for canteen/catering service.

It is however necessary to observe that given the usage indication trends at ‘moderate’ and ‘very high’ levels, that water supplies service can be said to have a considerable level of usage indications. When the aggregate of ‘very low’ and ‘low’ (low-usage) was considered, it was found that packaging and consultancy were respectively ranked for ‘low-usage’ by 43.6% of the port users.

## **6.8.5 Synopsis on the Potential usage of value-adding services**

### **6.8.5 (a) Transport delivery service - potential usage**

The importance of transport services for businesses and overall economic growth of any country is very significant. For instance, information from the British Chamber of Commerce stated that poor transport costs UK businesses £15bn a year (Commercial Motor, 2004). Consequently, the efficient and effective offer of transport delivery services can contribute to the growth of ports businesses and the economy as a whole.

Investigation from this study revealed that transport delivery service is the most desired type of service, among all the value-adding services examined. While a total of 48.6% port-user respondents in the Rotterdam and PD Teesport ports affirmed interest in the possibility of using transport delivery service at a 'high-usage' level, 51.4% and 71.7% of those in the Damietta Egyptian port and the Nigerian Apapa port respectively put forward the same level of usage interest for the service.

On the basis of these responses, it thus becomes evident that the desirability for transport delivery as a value-adding service is stronger in the ports of the developing economies of Egypt and Nigeria. This statement is particularly applicable to the Nigerian port (Apapa) wherein 46.1% of respondents were of the opinion that they will likely use transport service at a 'very high' level (see table 6.12).

The desirability for port-provided transport services, as noticed in the reported outcomes in the paragraphs above, is higher for port users in the ports in the developing economies than for their counterparts in ports situated in the developed economies. Nonetheless, the case study ports of The Netherlands (Rotterdam) and United Kingdom (PD Teesport) are respectively known for having a significant level of effective transport network and services, above those of developing economy ports. Rodrigue and Notteboom (2006) acknowledged that the development of better hinterland connections has redefined the functional roles of ports in the value chain, while generating a new pattern of freight distribution. Therefore, it would be right to

infer that this changing trends in port hinterland connections and roles have encouraged active participation of 3PLs (third party logistics) companies and in-house logistics operations, given the provision of better transport networks. As a result, if the port authorities/bodies are to provide transport services, port users in the developed economies are less desirous to use such services given an established in-house or 3PL provision of the services. This does not however imply the closure of opportunity for port authorities/bodies in developed economies to deploy transport services in port strategies, given dynamism in the port business environment.

On the basis of higher investments in logistical networks in developed economies, ports are encouraged to, where necessary, consider taking advantage of the opportunity to offer transport delivery and distribution services. The Port of Tyne Distribution Ltd is owned by the Port of Tyne in Newcastle upon Tyne (UK), and operates a full-functional and dedicated transport fleet and dispatches goods of customers (Port of Tyne, 2006). Another good example is the offer of transport/distribution services by the PD Logistics, based at the PD Teesport (PD Ports, 2008). An alternative method available to ports is to provide an enabling environment for 3PLs to render such services.

As competition between ports become tougher, transport delivery/distribution services can give a possible sharp edge for a port to go for the 'grab of cargoes' even in the hinterland of other ports. The view of Haezendonk and Notteboom (2002) supported this account, by outlining that the competitiveness of a port is increasingly becoming dependent on the external co-ordination and control. Thus, partnerships or contracts with clients (port users) to offer a dedicated transport delivery and distribution services, to and from ports can provide such needed external link and also facilitate the retention of port users.

#### **6.8.5 (b) Warehousing - potential usage**

As globalisation entrenches, with ports increasingly being major nodes in the global supply chain for the flow of goods and services, the significance of general and specialised warehouses in ports would be expected to increase correspondingly. This view becomes more important even as more companies of global scale businesses

seek to determine suitable decoupling points to apply the ‘leagile’ logistics concept. Admittedly, ports can potentially offer suitable opportunities as leagile decoupling points in the global supply chain for preparation of export goods through the seas or putting finishing touches on goods bound inland towards the downstream.

Examination of the outcomes on warehousing services revealed that while there was a ‘high-usage’ level affirmation by 43.2% of port-user respondents in the developed economies ports, 54.3% and 64.0% of those in the Egyptian and Nigerian ports respectively put forward the same possible usage statements. Offering of warehousing services was described by Martino and Morvillo (2008) as one of the long standing support services offered within the port system and has facilitated the creation of economies of scale and scope. This draws attention to the capacity of warehousing services in ports to attract different types of cargoes into the port for customisation in order to enhance a port’s business portfolio.

Among all the case study ports, intention for the likely usage of warehousing services is greatest in the Nigerian Apapa port. It was also observed that demand for the service was much more indicated by port users in the developing economies’ ports in Egypt and Nigeria.

#### **6.8.5 (c) Packaging- potential usage**

Investigation on packaging service showed that it is one of the services for which many port users in the Egyptian Damietta port declared their interest. While 51.4% of port-user respondents in Damietta port indicated usage interest for packaging service at ‘high-usage’ level, 33.2% of those in the Nigerian Apapa port held the same view.

For the ports situated in The Netherlands (Rotterdam) and United Kingdom (PD Teesport), confirmation of likely usage of packaging service was rather on the low side, with 67.5% of port users putting forward intentions for ‘low-usage’ level. There were nonetheless 16.2% of port users that would want to use the service at a ‘very high’ level. Insight from port users’ comments showed that despite the generally low intention to use packaging service, if provided by the ports, there exist some group of

port users who are eager to extensively use packaging services in the ports situated in developed economies.

Packaging operations and services would be expected to be in high demand in areas where exports and imports are flourishing, necessitated by activities such as complete or semi-manufacturing assembly or re-assembly of goods. This heightened desire for packaging and re-packaging of goods in developing economies can be viewed to be connected with the quest of merchants in developing economies to reach a standardized packaging level, given the enforcement of stringent regulations in destinations ports of developed economies. This statement is buttressed by CCICED (2000), which reported a rigorous search for ways to improve the packaging of woods for export from China to the USA, Japan, European states and Canada, so as to resuscitate foreign trade that declined as a result of packaging legislations in these countries.

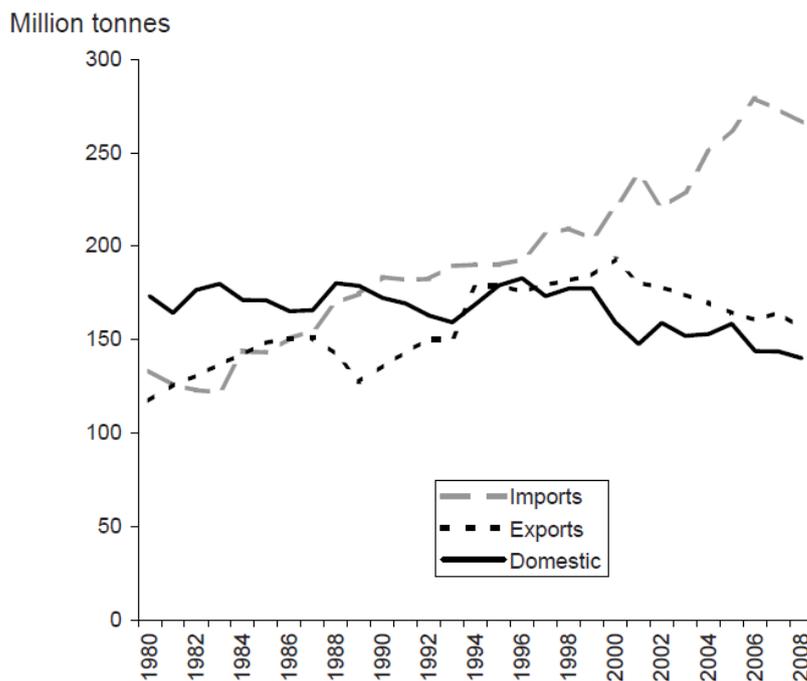


Figure 6.14: UK port Traffic by type 1998-2008 (Source: Department for Transport, 2009)

On the other hand, figure 6.14 illustrates a declining trend in the volume of cargo traffic throughput in UK ports, particularly concerning exports and domestic trades. Thus, it would be expected that there would be a level of decline in the need for packaging services that is normally encouraged by international exports and domestic

goods movements via ports. This finding about packaging and traffic throughput relationship can be generalised for ports in similar situations.

#### **6.8.5 (d) Technical Support- potential usage**

57.1% of the respondents in Egyptian Damietta port would want technical support service at 'high' level, while for 66.6% of Nigerian Apapa port users the likely usage rate is at 'high-usage' level. These outcomes revealed a high desire for technical support service by port users in the ports situated in the developing economies.

Ideally, technical support can be meaningful when provided by experts, who through scholarship and years of maritime/ports industrial experience have accumulated knowledge and expertise and thus can adequately offer technical support to others in the industry.

Although the degree of desire to use technical service is higher from port users in the developing economies' ports, there is in general terms, a fairly moderate desire for the service in the developed economies ports. Perhaps, given the level of accessibility to training and technological advancement in developed economies, more of the port-user companies were of the view that subscribing to a port's technical support should not be given high priority. However, results in this study make the importance of expertise and technical support more pronounced. An instance to support this statement was found in APC (2001), which stated that the Port of Amsterdam has an established arm known as Amsterdam Port Consultants, which has continued to offer knowledge-based and technical expertise services in the area of distribution and logistics to various port users and even to port management around the world.

#### **6.8.5 (e) Advertisement support- potential usage**

Port users' indication for the use of advertisement service at 'high' degree is strongest among Egyptian port users. While 40.0% of port-users respondents were of the opinion to use advertisement support at a 'high' rate in Damietta port, 35.8% and 13.5% of those in Apapa Nigerian and Rotterdam and PD Teesport ports respectively had the same interest. In this sense, advertisement support covers various activities

that can be explored by the ports in order to publicise the different businesses and services of the port users.

#### **6.8.5 (f) Assembly of cargo/product- potential usage**

A total of 40.0% of the Damietta port-user respondents showed interest to use assembly of cargo/product service at 'high-usage' level, whereas 38.4% and 32.4% of those in Nigerian Apapa and Rotterdam/PD Teesport ports put forward a likelihood of using the service at the same usage level.

On the other hand, analysis showed that 31.4% and 33.3% of port users in Egyptian Damietta and Nigerian Apapa ports did put forward opinion of potential use of 'assembly of cargo/product service' at a 'low-usage' level. In regards to the ports in The Netherlands (Rotterdam) and United Kingdom (PD) Teesport, intentions for the use of 'assembly of cargo/product' at 'low-usage' level is rather higher, which stands at a 48.6% of the total port-user respondents from both ports.

#### **6.8.5 (g) Consultancy- potential usage**

By a proportion of 37.2%, Damietta port users indicated a likely 'high-usage' level of consultancy services. They are thus shown to be particularly interested for consultancy services when compared to their counterparts in Apapa, Rotterdam and PD Teesport ports. A close examination of the outcomes revealed that while desirability for consultancy services is not generally high, port users in the developed economies ports particularly showed low interest.

Dr Johan Siebers, a Shell HR consultant made a statement to the effect that consultancy training is able to provide explicit knowledge and ability to function better in day-to- day business (Dawson, 2003). Since consultancy service has a lot to do with speciality information and knowledge, a point of observation in an attempt to better understand these outcomes, is that the level of information available to port users in the developed economies might possibly be a reason for the plummeting desire to use consultancy service.

#### **6.8.5 (h) Canteen/catering- potential usage**

If canteen/catering services were to be provided in the port, possible intentions to use the service at 'high-usage' level was put forward by 40.0% of respondents in Damietta port (Egypt), while 46.1% of their counterparts in Apapa port (Nigeria) held the same view. A balanced viewpoint would be that there is the desire to use the service at 'moderate' levels, and it is safe to infer that canteen/catering service is saleable among port users in the ports situated in developing economies.

On the basis that a proportion (83.7%) of the port users were of the opinion that they would merely use canteen and catering service at a 'low-usage' level, the service thus stands to be the least desired amongst all the value-adding services for port users in the developed economies.

#### **6.8.5 (i) Water supplies- potential usage**

Results from the Egyptian Damietta port showed that 37.2% of port users were of the interest to possibly use water supplies at a 'high-usage' level. For this level of usage, 46.1% of respondents held the same view in the Nigerian Apapa port. Taking into account the general trends in both ports, it can be said that the service is desired at considerable levels in the ports.

Likely usage of water supplies service by port users in The Netherlands and United Kingdom ports at a 'high usage' level was the opinion of 17.0% respondents. This can be seen as a pointer to a low level of intention to use water supplies service, resulting in 54.0% port users opting for 'low-usage'.

#### **6.8.5 (j) Cold storage- potential usage**

While there were a 37.1% proportion of port users in the Damietta Egyptian port who opted to use cold storage service at a 'high' level, only 15.3% of those in Nigerian Apapa port had the same usage opinion. In both ports, there were no indications to use the service at 'very high' levels. Although a high proportion of port users opted to use the service at 'low-usage' level, 10.8% of respondents in Rotterdam and PD Teesport ports were interested in possibly using cold storage at a 'very high' levels.

### 6.8.6 Strategic dynamics of value-adding services

To reiterate, the prime aim of this study is to thoroughly investigate the potential of value-adding services in strategy formulation for a port's competitiveness. On this basis, figure 6.15 supports further discussion in this section about some topical findings relating to the strategic dynamics of value-adding services in competitive strategy.

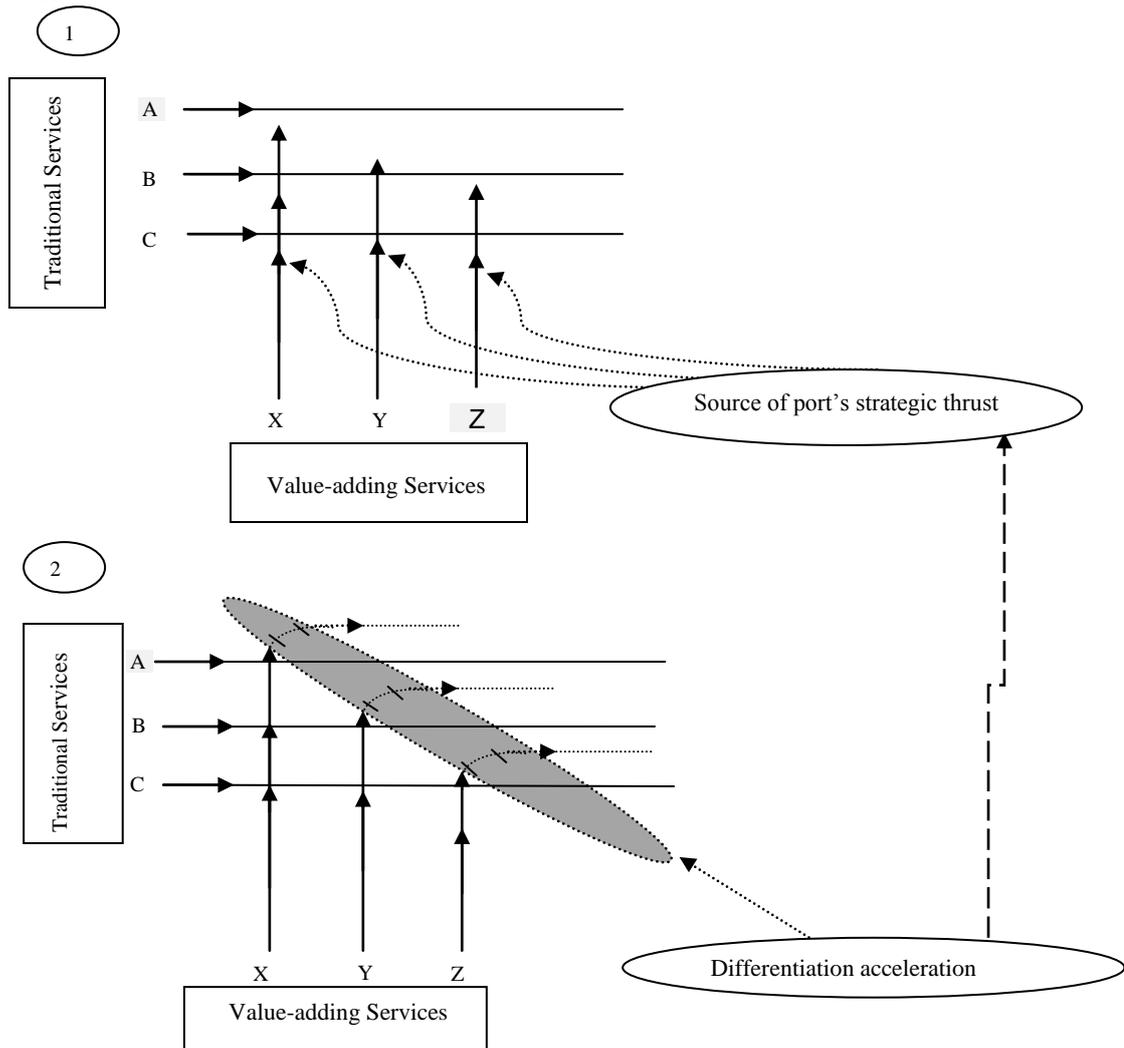


Figure 6.15: Strategic dynamics of value-adding services Strategy (Source: Author)

Port traditional services, in part '1' of figure 6.15 are generically represented in the horizontal stripes by A, B, C. These represent the fundamental services for which ports exist. Reference to the port value-adding service model in section 2.9 can assist in recalling that some of these traditional services include safety, vessel piloting, mooring, loading, unloading, in-port transit and environmental responsibilities.

Given the need to boost port competitiveness, value-adding services are introduced, as represented by X, Y, Z vertical icons. These value-adding services provide spearheads which are ‘sources of port’s strategic thrust’, offering support and enabling the port to keep its traditional services afloat. Strategic thrust, as herein referred is used in the sense to connote the idea of value-adding services having a substantial degree of potential to propel and sustain a port’s businesses competitively. This innovative view of the strategic thrust of value-adding services is largely based on the findings concerning the importance and potential usage of value-adding services and also supported by results of tested set propositions (section 7.4).

In part ‘2’ of figure 6.15 attention is called to trends that tend to develop along the line as value-adding services provide the needed support and boost to a port’s core or traditional services. Bearing in mind that value-adding services are unique and special offers to complement the core services, a stage is reached where it emerges to be the case that the uniqueness of the services begins to wear off. This stage is represented by the double arcs on the X, Y, Z stripes, which mark the commencement of curvatures that pull the vertical strategic thrust-boosting stripes to the horizontal (see figure 6.15 above). When these value-adding services’ representative vertical stripes are levelled to horizontal, there sets in a tendency for port users to merely equate or consider the services as being standard or traditional services.

In this study, the idea of carrying out investigation by a multiple case study research structure was to enable the infusion of various value-adding services perspectives and to stimulate learning, particularly for ports and port users in developing economies based on experiences of ports in the developed economies. It is thus relevant to recollect that the survey on possible usage of value-adding services, if the services were to be introduced and offered by the ports, resulted in a substantial proportion of port users in the developed economies opting to use many of the services at ‘low-usage’ levels. One of the main reasons for this outcome is believed to be connected with port users having had access to value-adding services for some time, thus the dynamics sets in triggering an increase in the tendency for the services to be considered and used just as standard or traditional port services.

The differentiation acceleration zone in figure 6.15 (part 2), presents renaissance opportunities for value-adding services prior to the stage of full levelling up as standard port services. In other words, as the deflection to the horizontal sets in, ports deploying value-adding services in business strategies should put in place and accelerate mechanisms to restore the uniqueness of the services. This would mean a continual search for various innovative services that make a port stand out as relevant to port users. Therefore, the ability to determine when the ‘differentiation acceleration zone’ sets in becomes *sine quo non* in order for a port to remain active in the use of value-adding services as competitive strategy. Acceleration of differentiation in this zone shall consequently resuscitate the ‘strategic thrust’ of value-adding services as shown in part ‘1’ of the figure (6.15). In logistical terms, differentiation is concerned with inclusion or deployment of activities or products of recognisable uniqueness to clients, which have the capacity to give a firm an outstanding competitive edge in the market (Porter, 1985; Brassington and Pettitt, 2007; Christopher, 2005; Hooley et al, 2008).

#### **6.8.7 Summary - Potential usage of value-adding services**

Although there was a substantial opinion to use value-adding services (if provided by ports) at ‘low-usage’ levels by port users in ports of developed economies, it was however the case that over 40.0% of the port users would want to use most of the services at a somewhat considerable levels (i.e aggregate ‘moderate’, ‘high’ and ‘very high’). Rather than a paradox, this scenario of lesser enthusiasm for value-adding services is deemed to have materialised on the basis that such services are currently in existence at a satisfactory level, particularly by in-house operations or third party logistics companies. Hence, any further provision of the services might not be so desired. Transport and warehousing services were the most desired among port users in ports of the developed economies.

Port users in the developing economies ports predominantly indicated strong interest to use most of the value-adding services, if provided by the ports. While technical support and transport services were the most desired by the Egyptian port users, transport, technical support and warehousing were correspondingly the most desired services by the Nigerian port users.

## **6.9 Summary - Analytical Presentation and Discussion of Research Data**

While the summaries of the different sections have been presented, the summary of the entire chapter (6) is hereby provided. In Damietta and Apapa ports, the most available value-adding services are warehousing and water supplies services respectively. For Rotterdam and PD Teesport ports, transport service is the most available value-adding services. In overall terms for all the case study ports, the most available service among the ten identified key value-adding services is transport service, followed by warehousing, water supplies and technical support.

Findings showed that value-adding services in ports are important for ports and port users businesses. For the Rotterdam and PD Teesport port users the most important service is transport. Assembly of cargo/product is the most important service for port users in Damietta, whereas for those in Apapa port it is water supplies. Concerning potential usage, transport and warehousing services are the most desired by Rotterdam and PD Teesport port users, while technical support and transport service are the most desired respectively by Damietta and Apapa port users.

Variations in the rating of services' importance and likely usage can be explained in the understanding that although a port user may consider a particular service to be very important, higher priority of potential usage can be given to another service. Some of the issues that can warrant such usage priority include in-house capabilities, market and business environment challenges. The dynamism found in the desirability of value-adding services, as discussed in section (6.8.6), emphasised the need to understand when to rejuvenate the strategic thrust of value-adding services in port strategy.

## **Chapter 7 - Further Analyses and Discussion of Research Issues**

### **7.1 Introduction**

This chapter provides an opportunity to carry out in-depth inferential analyses and to delve into further discussions of research issues raised in the course of this study. In the first instance, having commenced analysis and discussion of questionnaire data in chapter 6, a summary of information from interviews with management of ports shall be presented. On this basis, excerpts from the interviews will be drawn upon for discussion in this chapter. See appendix 3 for more details of port management opinions on issues about value-adding services in port strategy.

Although this research is particularly focused on investigating value-adding services in ports, other port selection criteria shall be examined. These include port location, cargo handling equipment, tide variations, skilled manpower and security. One of the analyses that will be carried out on these criteria is factor analysis in order to evaluate how they are interrelated.

For the testing of set propositions, all data collected by questionnaires from the case study ports shall be combined together, in order to reach the main aim of evaluating and understanding the impact of value-adding services. A new Port VAS model will be developed and there will be discussion on the formulation of strategy by value-adding services based on the outcomes of tested propositions and evaluation of value-adding services prospects in attracting and retaining port users.

This chapter also presents discussions on the extent to which value-adding services are deployed in the various case study ports as examined in this study. It concludes by presenting discussions on the level of port users' awareness of value-adding services.

## **7.2 Port management interview summary**

While research data collection was focused on the four case study ports, during interviews with port management, some other ports apart from the case study ports were included in order to broaden opinions on value-adding services. Most of the interviews were carried out before the questionnaire survey, with information received supporting the development of questionnaire. Other interviews took place concurrently with the questionnaire survey or after.

On an average, the duration of the telephone and face-face interviews was about 55 minutes. The details of those interviewed and dates of interview are:

- Advisor corporate Strategy - Port of Rotterdam (Date: 25/03/2009)
- Assistant Chief Port Strategist - Apapa Port (Date: 07/04/2009)
- Operations Manager - Damietta port (Date: 20/11/2010)
- Business Development Manager - ABP Port of Hull (Date: 20/03/2009)
- Port Manager - NPA Port Harcourt (Date: 27/12/2008)
- 'Anonymous' - NPA Port Harcourt (Date: 27/12/2008)
- Executive Director - Port of Los Angeles, CA (Date: 08/06/2009)
- Sales and Marketing Manager - PD Teesport (Date: 01/11/2010)

Table 7.1 presents a summary of salient management opinions on value-adding services (VAS) in port's strategy.

Table 7. 1: Summary of information gathered from interviews with port management

Issues of discussion	Presentation of port management opinions
1. VAS availability in ports (examples of VAS):	<ul style="list-style-type: none"> <li>• Pre-Delivery Inspection (PDI) of cars; treatment of timber; fire fighting, packaging</li> <li>• Distribution; facilitation of materials/products sales; cold storage; consultancy etc.</li> </ul>
2. Resources needed for development and offering of VAS:	<ul style="list-style-type: none"> <li>• LAND; trained workforce; stable flow of materials/cargo; capital; good communication by roads and rails connections; support from authorities; concession of port, enabling business environment etc.</li> </ul>
3. VAS Potentials in Port's Strategy- (Attraction of port users):	<ul style="list-style-type: none"> <li>• 6 out of the 8 port management interviewees held definite opinions that 'VAS can form a strong means of competitive differentiation to attract port users'.</li> <li>• 2 out of the 8 interviewees were of definite view that 'VAS can be used, but not a very strong competitive means of attracting port users'.</li> <li>• There were no opinions that 'VAS cannot be used to differentiate a port for competitive advantage'.</li> </ul>
3b. VAS Potentials in Port's Strategy- (Retention of port users):	<ul style="list-style-type: none"> <li>• 6 out of the 8 interviewees held that 'VAS can strongly increase port users' retention in ports'.</li> <li>• 2 out of the 8 the interviewees were of the opinion that 'offering of VAS is not a very strong means of retaining port users'.</li> <li>• There were no opinions that 'VAS cannot be used for retention of port users in ports'.</li> </ul>
4. Reasons for offering VAS in the ports:	<ul style="list-style-type: none"> <li>• To secure port business for competitiveness; demands of customers; to complement port services and</li> <li>• Profit maximisation</li> </ul>
5. Possible expansion of VAS range:	<ul style="list-style-type: none"> <li>• Expansion would generally be customer-driven.</li> <li>• There is an expectation to expand the range of VAS available.</li> </ul>

Continuation of table 7.1 (Interview summary)	
Issues of discussion	Presentation of port management opinions
6. Major problems/ challenges to offering value-adding services in ports:	<ul style="list-style-type: none"> <li>• Ability to adequately match services with customers need.</li> <li>• Sufficient flow of cargo (i.e. long term traffic source).</li> <li>• Copying of strategy by competitors; lack of technical expertise</li> <li>• Government and other stakeholders' issues.</li> </ul>
7. Recent port strategies:	<ul style="list-style-type: none"> <li>• Long term project commitment, organic growth</li> <li>• Port concession (i.e. privatisation)</li> </ul>
8. Other Reasons that attract port users to Ports:	<ul style="list-style-type: none"> <li>• Geographical advantage (both from seaside and shore side); proximity to free zones.</li> <li>• Land availability, shore site and hinterland connections (i.e. good road and rail networks).</li> <li>• The influence of pricing policies on choice of a port.</li> <li>• Equipment and facilities availability; process simplification.</li> <li>• Vessel turnaround times in the port.</li> </ul>
9. Other Comments	<ul style="list-style-type: none"> <li>• Analysis of strength for each traffic category; e.g. the type of cargo handled could be strength or weakness to offering some value-adding services.</li> <li>• The viability of VAS; e.g. cost (efficiency) and sustainable environment (green).</li> <li>• Social awareness of a port can differentiate it; e.g. assisting in education can increase the proportion of skilled labour around the port's community</li> </ul>

Reference should be made to appendices 2 and 3 for the interview checklist and detailed interview results with port management. With the summarisation of information from interviews, attention shall be refocused to the analysis of data from questionnaire.

### **7.3 Port users' port selection criteria variables**

There are various reasons or criteria by which port users can choose to use a port. Although this study is particularly focused on investigating value-adding services' capacity to attract and retain port users to a port, this section is dedicated to examining other criteria for port users to patronise a port. Given the need for an overall evaluation of these criteria, all data collected by questionnaire survey were combined

together for this investigation. The criteria for port selection, as evaluated in table 7.2 were identified from the literature and then presented to port users for evaluation in the questionnaire. These criteria are known to influence port users' decision in making choice of a port.

Results presented in table 7.2 are products of data from questionnaire by port users ranking the various criteria according to importance, from 1 (very low) to 5 (very high). In order to maintain consistency in evaluating the ranking of these criteria, only the combinations of 'high' and 'very high' (high-importance) rankings are presented as follows:

Table 7.2: Port users' port selection criteria variables (overall Statistics)

Selection Criteria	Port Users' Ranking (Combination of 'High + Very High' ranking)		
	Frequency	N	Percentage (%)
Port Location	96	111	86.5%
Cargo Handling Equipment	93	111	83.8%
Tide Variations	91	111	81.9%
Skilled Manpower	91	111	81.9 %
Security	91	111	81.9%
Infrastructure	90	111	81.0%
Service Quality	89	111	80.1%
Quick Response	88	111	79.2%
Stable Legislations	85	111	76.5%
Computerised/IT aided Operations	83	111	74.7%
Inter-modal Transport Facilitation	76	111	68.4%
Value-Adding Services (VAS)	75	111	67.5%
Management Structure of the Port (eg. Landlord-Operator)	70	111	63.0%
Capital to Start Business with a Port	64	111	57.6%
Port Safety	60	111	54.1%
Port Charges	55	111	49.5%
Port Service Reliability	51	111	45.9%
Number of Berths	44	111	39.6%
Simplified Documentation Process	42	111	37.8%

The proportions of port users and the corresponding port selection criteria they assigned top high importance ranking include: port location (86.5%), cargo handling

equipment (83.8%), tidal variations (81.9%), skilled manpower (81.9 %), security (81.9 %), infrastructure (81.0 %) and service quality (80.1%). These are therefore the seven most important criteria or service features in selection of ports by port users. On the other hand, the criteria that emerged with the lowest ranking, according to the proportions of port users rating include simplified documentation process (37.8%), number of berth (39.6%) and port service reliability (45.9%).

It is noteworthy that value-adding services neither emerged at the higher nor lower ends, but in the middle of port users' ranking of port selection criteria. Hence, the significance of this outcome is that among criteria for port users' selection of ports, value-adding services are of moderate importance. Although Ugboma et al. (2004) indicated a low importance ranking for value-adding services, the outcome in this study is that value-adding services in ports are not necessarily of low importance to port users. There is a natural expectation that core port services and features would be placed in priority to value-adding services. This does not intrinsically imply that value-adding services are low in importance to port users.

### 7.3.1 Factor Analysis of Port users' port selection criteria variables

The reason for carrying out factor analysis on the identified port selection criteria was to evaluate the criteria by investigating how they are interrelated. This technique allows the reduction of criteria (variables) to comprehensible groupings. Factor analysis summarises interrelated variables into component (factors) groupings, by showing the most common variance among the variables using a correlation matrix (Malhotra, 1999; Field, 2009).

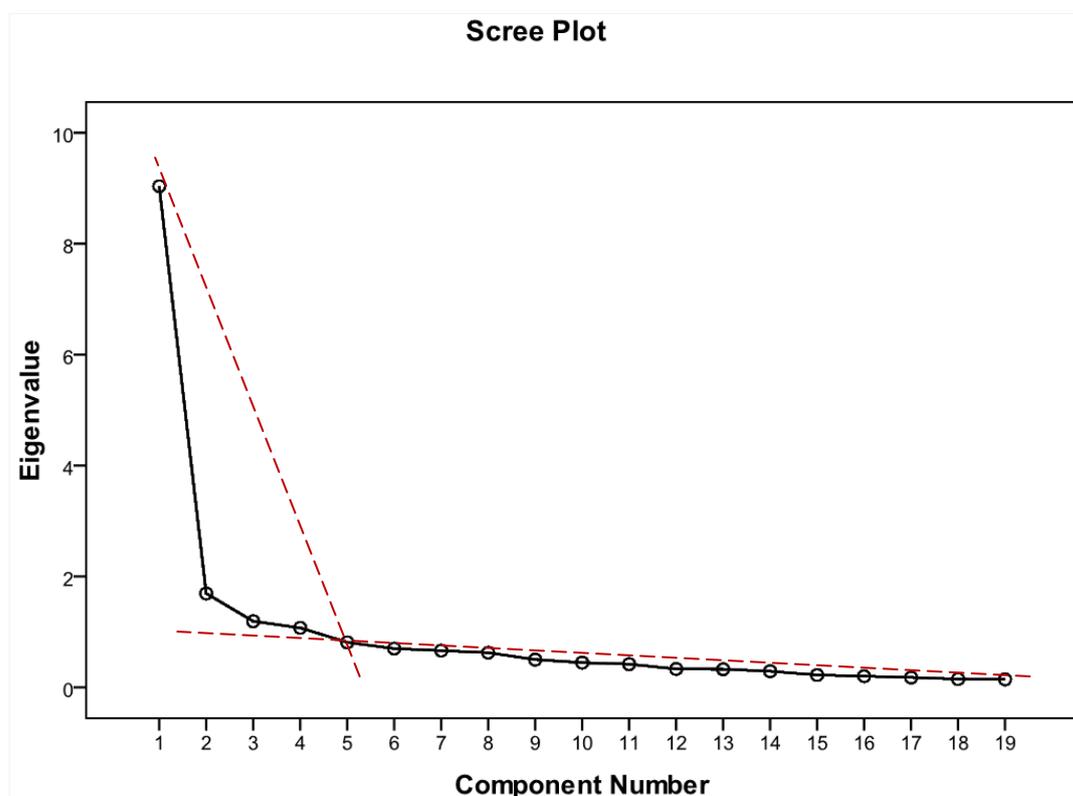


Figure 7.1: Factor Extraction Scree plot

Figure 7.1 presents a factor analysis scree tree which showed that of the nineteen (19) criteria (on the horizontal axis), four (4) factors of eigenvalues above one (1) were extracted as shown in table 7.3 based on Kaiser method, with an excellent KMO and Bartlett's Test value of 0.9 and ( $p < 0.001$ ). Eigenvalue connotes the value of interrelatedness in various variables, and generated factors (interrelated variables) with eigenvalue more than one significantly stands out to represent others.

[Note: KMO is an index that indicates the appropriateness of factor analysis, where there is high value between 0.5 and 1.0, while values below 0.5 reveal inaccuracies in the analysis (Malhotra, 1999)].

Thus, the obtained result implies that four groupings (factors) were created according to underlying interrelated features of the variables. In effect, factors do not correspond perfectly with original variables, but are only a representation of common features in various variables. Table 7.3 presents the four (4) extrapolated factors under the heading ‘component’, which were then subjected to analytical discussion in section 7.3.2.

Table 7.3: Rotated (resultant) Component Matrixa

	Component (FACTOR)			
	1	2	3	4
Port Safety	.871			
Computerised/IT aided Operations	.820			
Simplified Documentation Process	.772			
Quick Response	.722			
Service Quality	.699			
Inter-modal Transport Facilitation	.675			
Cargo Handling Equipment	.673			
Security	.635	.433		
Skilled Manpower	.557	.543		
Port Service Reliability	.535	.418		
Management Structure of the Port (eg. Landlord-Operator)		.783		
Number of Berths		.758		
Value-Adding Services (VAS)	.485	.594		
Capital to Start Business with a Port		.586		
Tide Variations		.508		
Port Location			.824	
Port Charges			.807	
Stable Legislations				.793
Infrastructure				.449
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.				
a. Rotation converged in 6 iterations.				

### **7.3.2 Examination of the extracted factors from port selection criteria**

This section presents discussions on the various criteria of port selection variables categorised under each of the factor (component).

#### **(1) Factor 1 - Port logistics operations facilitation**

Predominantly, the port selection criteria under factor 1 had features which generally can be described as related to ‘port logistics operations facilitation’. As shown in table 7.3, these criteria (service enablers) include port safety, computerised/IT aided operations, simplified documentation process, quick response (QR), service quality, intermodal transport facilitation, cargo-handling equipment, security, skilled manpower, port service reliability and value-adding services. By implication therefore, these services and service-enablers categorised as ‘port logistics operations facilitation’, form one of the fundamental groups of port selection criteria.

#### **(2) Factor 2 - Administrative/management related facilitation**

Factor 2 largely represented an extrapolation of management and administrative features of port users’ port selection criteria. The services and service-enablers in this factor include security, skilled manpower; service reliability, management structure of the port, number berths, value-adding services and capital to start business with a port. It is thus useful to observe that for port users, the manner of ‘administrative and managerial related facilitation’ obtainable, forms a significant issue for consideration in the selection of port.

#### **(3) Factor 3 - Hinterland related attributes**

Industry knowledge of trends in maritime traffic flow and business shows that there is a relationship between port selection criteria (variables) of factor 3 in table 7.3 with the hinterland of a port. The two port selection criteria of concern are port location and port charges. Fundamentally, a port’s hinterland refers to a geographical area wherein the port has dominant, if not exclusive share of the generated traffic flow (Tsamboulas, 2008; Rodrigue and Notteboom, 2006). Though not directly proportional to annual tonnage handled in a port, there is a tendency that a port with

large productive hinterland of active import and export stakeholders, would exercise more leverage over port charges. This assertion is supported by economic principles on proportional relationship between demand and prices (Abel et al. 2008, Lipczynski and Wilson, 2004, Bamford, 2006).

When port users from a cargo-productive hinterland depend on the services of a particular port, there sets in a situation where the port would be in a better position to influence charges for the services. On the other hand, location is a major factor that naturally determines the hinterland of a port. This indicates that hinterland related features are core factors in port users' selection of ports.

#### **(4) Factor 4 - Port fundamentals**

Infrastructure and stable legislation port selection criteria, as grouped in 'factor 4' can reasonably be considered as fundamentals for a port setting or environ. By port fundamentals, attention is called to the fact that there are some basic port environmental needs, in form of hardware (physical) or software (non-physical) features that are of importance to port users. As such, the provision of sound infrastructural needs, stability in legislation, and other forms of port setting essentials constitute vital port selection criteria for port users.

#### **7.3.3 Summary - Port selection criteria**

In fulfilment of research aim 3 (see 1.3.2), this section has analytically examined other port-users' port selection criteria, apart from value-adding services, which happen to be the principal subject of this study. Through factor analysis process, it has been shown that there were four groupings of factors considered in port users' selection of ports, namely 'port logistics operations facilitation, administrative/management related facilitation, hinterland features and port fundamentals'. These factors correspond with some of the outcomes of Yeo et al.'s (2010) factor analysis of port competitiveness components, which include logistics cost, hinterland condition and connectivity.

Although among other criteria, value-adding services were not ranked in the very top criteria for selection of ports, the services were found to be integral parts of both 'port

logistics operations facilitation' and 'administrative/management related facilitation' factors. This indicated that value-adding services have underlying versatile potentials.

Port selection criteria that emerged as most important in port users' selection of ports include port location, cargo handling equipment, tidal variations and service quality. In comparison with other criteria, value-adding services emerged in the middle, indicating moderate importance in port-users' port selection criteria.

#### **7.4 Test of Research Propositions**

In order to achieve the principal aims of this research project, with particular reference to 'aim number 4', propositions were postulated as set out in section 1.4. Data for all tests of propositions were those of all port-users responses to certain questions of the questionnaire. Using data this way ensured having a unified standpoint of all port users concerning the use of value-adding services in port strategy.

To test the research propositions, chi-square tests were carried out. According to Proctor (2005) a simple inspection of the variables upon which chi-square tests are to be carried out may suggest association between the variables in question. However, the reason for carrying out the chi-square test in this research was to verify whether observable association in the variables is statistically significant and not an occurrence of chance. Additionally, in order to ensure that the right research proposition is not rejected, the Fisher's exact test was also carried out in this section, which gave compelling confirmation of the resultant outcomes.

With data collection and analyses having been carried out, results and discussions on these propositions which are related to the potential of value-adding services in port strategy formulation are hereby presented:

##### **(a) Proposition 1 - VAS association with the attraction of port users to a port**

The first proposition postulated in section 1.4 suggested an associative relationship between the offering of value-adding services and attraction of port users to a port. A chi-square test carried out by crosstabulation of data obtained from questionnaire questions number 8 and 9, which were designed to examine the attraction effect of value-adding services, resulted in a Pearson chi-square statistic value 47.979.

Table 7.4: Chi-Square Tests (VAS' port-users attraction potentials)

	Value	Df	Asymp. Sig. (2-sided)
<b>Pearson Chi-Square</b>	<b>47.979<sup>a</sup></b>	<b>4</b>	<b>.000</b>
Likelihood Ratio	44.597	4	.000
Linear-by-Linear Association	40.240	1	.000
N of Valid Cases	100		
a. 4 cells (40.0%) have expected count less than 5. The minimum expected count is .51.			

Table 7.4 presents the chi-square test results which yielded a highly significant p-value of ( $p < 0.001$ ). Given that the resultant p-value is less than the set significance level of 0.05, it implies that there exists a strong significant relationship in the variables (i.e. between VAS and attraction of port users). The implication, therefore, is that there exists an associative relationship between offering of value-adding services and attraction of port users to ports.

The statement beneath the table 7.4 that '*4 cells have expected count less than 5*' cast some shadow, because there is normally a desire to have up to 5 counts (frequencies) in each cell. See appendix 8 for details of chi-square test's crosstabulation distribution of data on VAS attraction potentials. Although parametric tests are more robust, chi-square test is one of the widely used nonparametric significance tests (Cooper and Schindler, 2006). Field (2009) encouraged the use of Fisher's invented test to further investigate the significance of a chi-square test results in circumstances where the counts (frequencies) of the cells are less than 5, as is the case in table 7.4.

To this extent, the Fisher's exact test, which has capacity for greater degree of accuracy, was used to compute the exact probability of the chi-square results.

Table 7.5: Attention- Fisher's Exact Test

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	47.979 <sup>a</sup>	4	.000	.000
Likelihood Ratio	44.597	4	.000	.000
<b>Fisher's Exact Test</b>	<b>41.425</b>			<b>.000</b>
N of Valid Cases	100			

In table 7.5, attention is particularly drawn to Fisher's exact test result with a statistic value of 41.425, which yielded a very significant p-value of ( $p < 0.001$ ). The high significance of this result goes to further substantiate the chi-square's results as being very reliable, supporting reiteration that the results were not products of chance but of statistical consistencies.

Of the port management interviewed, 6 out of the 8 were of the opinion that the use of value-adding services is a strong means of competitive differentiation to attract port users (see table 7.1).

An excerpt from interview statements affirming VAS attraction potentials is:

*'There is a saying that 'services that prospered traded in cargo and physical items'. In the future, institutions/firms must be prepared to trade in ideas. 'Ideas rule the world- the same is true for the port sector' (Port Manager, NPA Port Harcourt,).*

The need for ideas as communicated in this statement points to the inevitability of innovative developments, which are in line with a core aspect of value-adding services' customisation, as discussed in section 2.8 of the theoretical perspective chapter. Just like the development of services should be followed stepwise (Edvardsson and Olsson, 1996), even so the generation of ideas and offering of customised value-adding services requires generating and implementing robust ideas.

Given these scrutinizing processes, the research 'proposition 1' 'the patronage level to a port by port-users is associated with the value-adding services obtainable from that port' was accepted.

**(b) Proposition 2 – VAS association with the retention of port users to a port**

The second proposition postulated in section 1.4 suggested an associative relationship between offering of value-adding services and retention of port users in a port. To test this assertion, a chi-square test carried out on data from questionnaire questions number 8 and 10 gave a statistic value of 30.241, as shown in table 7.6.

Table 7.6: Chi-Square Test Result (VAS' port-users retention potentials)

	Value	df	Asymp. Sig. (2-sided)
<b>Pearson Chi-Square</b>	<b>30.241<sup>a</sup></b>	<b>4</b>	<b>.000</b>
Likelihood Ratio	30.291	4	.000
Linear-by-Linear Association	29.072	1	.000
N of Valid Cases	98		
a. 5 cells (50.0%) have expected count less than 5. The minimum expected count is .43.			

It would be observed from table 7.6 that the resultant chi-square value has a p-value of ( $p < 0.001$ ), which at the set significance level of 0.05 represented a highly significant relationship between the variables under investigation. The connotation of this outcome is that there is a strong association relationship between the offering of value-adding services and port users' retention in ports. See appendix 8 for details of chi-square test's crosstabulation distribution of data on value-adding services' port users' retention potential.

For the purpose of assurance and confidence in results, given that 5 cells have less than 5 counts (in table 7.6.), further tests and investigations were deemed necessary. Consequently, a Fisher's exact test was carried out in order to ascertain the degree of accuracy of the chi-square results.

Table 7. 7: Attention- Fisher’s Exact Test

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)
Pearson Chi-Square	30.241 <sup>a</sup>	4	.000	.000
Likelihood Ratio	30.291	4	.000	.000
<b>Fisher's Exact Test</b>	<b>28.270</b>			<b>.000</b>
Linear-by-Linear Association	29.072 <sup>b</sup>	1	.000	.000
N of Valid Cases	98			
a. 5 cells (50.0%) have expected count less than 5. The minimum expected count is .43.				

In table 7.7, attention is particularly called to the result of the Fisher’s Exact test which yielded a statistics value of 28.270, having a p-value of (p<0.001). This resulting p-value depicts a highly significant outcome, and thus validated the chi-square results for the tested proposition on retention of port users. As a result, it was confirmed that the outcome of the test was not an occurrence of chance, but based on consistent statistical trends in the examined data.

Additionally, 6 out of the 8 interviewed port management personnel were of the opinion that value-adding services can strongly increase retention of port users in ports (refer to table 7.1). In this regard, one of the experts commented:

*‘If the port management decides that the VAS is important to retain certain cargo/trade flows, they can give incentives to start up VAS companies and they can take this into account for land lease strategy’ (Advisor corporate Strategy, Port of Rotterdam)*

While other issues raised by this comment shall be subjected to further scrutiny, at the moment it suffices to acknowledge that it is one of the remarks put forward in favour of value-adding services’ potential in retention of port users.

Having critically subjected ‘proposition 2’ to different levels of statistical analyses and examinations, it was accepted that ‘the capacity of a port to retain port-users is associated with the value-adding services obtainable from that port’.

## 7.5 The Extent of offering value-adding services in the Ports

This section discusses the extent to which value-adding services are deployed in the various case study ports as examined in this study. As a result, it is one of the sections designed to meeting the number two (2) research aim outlined in section 1.3.2, in regards to investigating how value-adding services are deployed in developing and developed economies ports. Table 7.8 shows the outcomes of analysis of the extent of offering value-adding services (VAS) in the ports. (Note: The ‘Total’ column refers to general indications for the options e.g. ‘VAS is not in existence’, ‘offering of VAS is very high’, while the ‘Total’ row refers to indications per port).

Table 7. 8: Extent of offering Value-Adding Services in the Ports

		Developed Economies	Developing Economies (Egypt)	Developing Economies (Nigeria)	Total
Extent of offering Value-Adding Services in the Port	<i>Value-Adding Services are not in Existence</i>	0 .0%	3 8.6%	0 .0%	3 2.7%
	<i>Value-Adding Services are Scarcely Offered</i>	6 16.2%	2 5.7%	9 <b>23.1%</b>	17 15.3%
	<i>Value-Adding Services are Moderately Offered</i>	7 18.9%	14 <b>40.0%</b>	20 <b>51.3%</b>	41 <b>36.9%</b>
	<i>Value-Adding Services are Offered Considerably</i>	15 <b>40.5%</b>	14 <b>40.0%</b>	6 15.4%	35 <b>31.5%</b>
	<i>Offering of Value-Adding Services is Very High</i>	9 <b>24.3%</b>	2 5.7%	4 10.3%	15 13.5%
	Total	37	35	39	111
	Count & % within ports	100.0%	100.0%	100.0%	100.0%

Only significant outcomes in the investigation of the extent of offering value-adding services (VAS), as summarised in table 7.8 were further analysed and presented as follows:

- **Rotterdam & PD ports:** Observation of opinion results on the statements: ‘value-adding services are offered considerably’ and ‘offering of value-adding services is very high’ as presented in table 7.8 showed that a combined 64.8% of port-user respondents confirmed these statements as true. Hence, the extent of offering value-adding services in these ports of developed economies is considerably high. This conclusion was supported by a high percentage of port users who held opinions that most of the ten (10) key value-adding services were available in the ports (section 6.6.1).
- **Egyptian Damietta Port:** Concerning proposals ‘value-adding services are moderately offered’ and ‘value-adding services are offered considerably’, it was found that a combined 80.0% of the port users in Damietta port confirmed these assertions. Also, previous indication of value-adding services availability by high proportion of port users (see section 6.6.2) strengthens the basis to conclude that these services are offered at a considerable level in the Damietta port.
- **Nigerian Apapa Port:** For the assertions ‘value-adding services are scarcely offered’ and ‘value-adding services are moderately offered’, a combined 74.4% of port-user respondents from Nigerian Apapa port affirmed these statements as being true in the port. In essence therefore, this outcome pointed to the fact that while spanning between ‘scarcely and moderately offered’ ratings, the extent of offering value-adding services in the Nigerian port is considered to be at a moderate level.

Offering of value-adding services was generally found to be higher in ports of the developed economies than is the case for ports of the developing economies. The services are therefore offered more readily in ports of the developed economies. For the ports in the developing economies, opinions point to the fact the services are moderately offered in general terms. However, value-adding services emerged to be offered at a considerable level in the Damietta Egyptian port, while the services are moderately offered in the Nigerian Apapa port.

Areas of logistical deficiency would possibly be hidden opportunities waiting to be harnessed. The Economist (2009) stressed the importance of learning from

companies that have effectively harnessed business opportunities created by the difficulties of economic recessions and scarcities. Consequently, the moderate levels of offering value-adding services in the developing economies ports in conjunction with the high likely usage indications in sections 6.8.3 and 6.8.4, point to the existence of opportunities worthy of further exploration in the port industry.

The need for continual development in transport and logistics cannot be overemphasised (Bowersox and Closs 1996; Dinwoodie, 2000; Christopher, 2005) given the associated short and long term socioeconomic benefits. This runs in parallel with Hoyle and Hillings (1970) observation that the gap between developed and developing countries would certainly widen, except developing economies pay attention to the technological developments in advanced nations. On this basis, experiences of ports in developed economies in the extensive development and deployment of value-adding services, as shown in this study should serve as case studies from which ports and port users in the developing economies can learn from in the bid to improve innovations in port value-adding services.

#### **7.5.1 Summary- Extent of offering value-adding services**

Following discussions in this section, the offering of value-adding services in the ports based on findings in this study are summarised as:

- Rotterdam and PD ports: value-adding services are readily offered at considerably higher levels than is the case in the ports of developing economies.
- Egyptian Damietta port: value-adding services are offered at a considerable level.
- Nigerian Apapa port: value-adding services offered at a moderate level.

Finally, findings showed that there exist potential business opportunities in offering of value-adding services in ports' strategies, particularly in the developing economies ports where the extent of offering value-adding services was largely between scarce and moderate levels.

## 7.6. Level of port users' value-adding services awareness

Provision of adequate training and education can have far-reaching effect on the development of logistics and transport industries (Morvillo, 2002; Vellecco, 2002). While acknowledging the need to develop high calibre managers in the shipping logistics profession as addressed by Dinwoodie (2000), another necessity is the transference of logistics knowledge to third World by Dadzie (1998). Essentially, these views are related to facilitating awareness acquisition about different aspects of maritime business. In this light, this section reports investigation on the level of port users' awareness of value-adding services. Intrinsically, awareness as herein referred encompasses being conversant with the terminology, clarity in identifying value-adding services and related features.

Table 7.9 provides a summary of the extent of port users' awareness of value-adding services in the different case study ports.

Table 7. 9: Summary for level of awareness

	Developed economies Port		Egyptian Port		Nigerian Port	
	N	Percent	N	Percent	N	Percent
No Awareness of Value-Adding Services	-	-	-	-	2	5.1%
Slightly Aware of Value-Adding Services	3	8.1%	2	8.1%	2	5.1%
Moderately Aware of Value-Adding Services	7	18.9%	10	18.9%	23	<b>59.0%</b>
Considerably Aware of Value-Adding Services	15	<b>40.5%</b>	13	<b>40.5%</b>	7	17.9%
Very Much Aware of Value-Adding Services	12	<b>32.4%</b>	10	<b>32.4%</b>	5	12.8%
Total	37	100%	35	100%	39	100%

In the following discussion, attention is particularly focused on significant outcomes.

- **Rotterdam & PD ports:** Significantly, port users in the Rotterdam and PD Teesport ports rated their awareness of value-adding services to be between

‘considerable’ and ‘very much aware’. Indications in this regard became particularly pronounced with 40.5% of port users rating their awareness as being ‘considerable’. On this statistical basis, it is admitted that port users in the Rotterdam and PD ports are considerably aware of value-adding services.

**Egyptian Damietta Port:** Based on port users’ opinions, the extent of their awareness of value-adding services in the Damietta port was in the range of ‘moderate’, ‘considerable’ and ‘very much aware’. Given that the ratings peaked with 37.1% of port users rating their VAS awareness as being ‘considerable’, it was thus appropriate to conclude that port users in the Damietta port are considerably aware of value-adding services. However, the awareness is lower than is the case for port users in the developed economies ports.

- **Nigerian Apapa Port:** The extent of port users’ awareness of value-adding services in the Apapa port was generally rated to be at a ‘moderate’ level. It is observed in table 7.9 that though there were ratings at various other levels, a significant 59.0% of port-user respondents from Apapa port opted for being ‘moderately aware’ of value-adding services. As a result, it was considered that Nigerian Apapa port users are moderately aware of value-adding services.

### **7.6.1 Summary - level of port users’ value-adding services awareness**

Port users’ value-adding services awareness in Rotterdam and PD Teeport ports was found to be higher in comparison to that of their counterparts in the two developing economies’ ports. While this study contributes to enhancing understanding of the awareness level of value-adding services in ports, it is important to state that these levels of awareness are adequate for consideration and development of value-adding services in port’s strategy.

## **7.7 VAS Strategy in ports**

Results and analysis of tested propositions on value-adding services' prospects in attracting and retaining port users showed that the services have the capacity to be used in the strategy of ports. These findings were profoundly based on port users' opinions, hence in coherence with the view of Chan et al. (2000) that a firm can opt to formulate its strategies on the basis referred to as 'customer fit'. This implies the ability to consider and adequately align a firm's strategy to fit in with customers' desires.

Based on preferences for ports that offer value-adding services (appendix 8), results of the 'impact' analysis illustrated significantly that offering these services has potential to attract and retain port users. In a similar assessment, while acknowledging accompanying intricacies, the majority of the interviewed port management personnel reiterated that value-adding services can be a source of competitive advantage for ports.

In the face of competition therefore, it is imperative to objectively assess deploying value-adding services in the formulation of port's competitive strategies. Given different levels of demands (potential) for value-adding services in the case study ports, there would be differences in the viability of deploying VAS in the strategies of ports. Karolefski (2007) in a scrutiny of the services of logistics providers companies indicated that trends in the industry showed an increasing rise in the demand of 'value-adding services' and that this will continue to represent a greater percentage of services offered by supply chain management companies. Stressing the prowess in well articulated value-adding services, Bowersox (2007) and Christopher (2005) pointed out that the services are able to differentiate a firm for competitiveness. Findings that value-adding services are potential source of gaining competitive advantage in ports, reinforced these authors' views which formed the major part of the conceptual framework (background) of this study in chapter one. Hence, findings in this study on the capability of value-adding services as a means of gaining competitive advantage in ports become more compelling.

Admittedly, on the basis of desire for services, deploying value-adding services for competitive port strategies at present and in the near future is more promising and stronger in the ports of developing economies than is the case for ports in developed economies where the services have existed at significant levels for a long period of time. However, because value-adding services are customer-tailored and geared towards meeting specific needs, it would be expected that different types of the services would continually evolve in both developing and developed economies.

It would be expected that some ports around the world will exhibit inertia to the idea of developing and offering value-adding services as a means for developing port competitive strategy. To this extent, it should be noted that given dynamism in global supply chains, patterns of port users' demands of traditional port services are prone to change. As such, the awareness and capability of a port to, in the first instance, readily carry out objective assessments of potential means of offering value-adding services in the short term or long term, directly or indirectly is greatly encouraged.

Investigation results supported the observation that over time as value-adding services are offered, the tendency of regarding them as basic services increases, hence diluting the desire for the speciality of the services. It may therefore be predicted that as more and more ports in the developing economies develop value-adding services, the desirability of such services by port users would probably reach a turning point, as was generally the case for the ports in developed economies. This goes to demonstrate the dynamism in developing and deploying value-adding services in a port's competitive strategy.

### **Diversification Potentials**

Most experts in the maritime sector would agree that shipping services and ship liners are the core sustainers of both the port and shipping industries. The recognition of ongoing turbulence in the shipping market caused mainly by freight rates (Alizadeh and Nomikos, 2009), exacerbates the urgency for enhanced and well founded business risk management, not just for shipping business, but also for ports and other maritime businesses. One of the core established methods of strategizing for competitive growth and risk management for firms is by diversification (Lambin, 1997; Doyle, 2008; Soppe et al., 2009). While value-adding services can be deployed for immediate

and long term port business sustainability by attracting and retaining port users, offering of the services can prove a veritable means by which ports can diversify their businesses.

As key port operators continue to go global, it is imperative to recognise that skills developed by offering some VAS can form a strong basis for business expansion and competitiveness as the scramble for port business around the globe intensifies. For example, the Amsterdam Port Consultants arm (APC, 2007), have not just supported its founder (Port of Amsterdam), but also have had projects in many ports of the world, especially in developing economies. Hence, expertise developed by the Amsterdam port in consultancy is of benefit to its direct port users and also to other ports and their users.

### **Resources and Challenges of VAS in ports**

There are resources required for the offering of value-adding services in a port, which are worth thorough consideration before investing in the services. As gathered from research interviews (section 7.2 and appendix 3) and questionnaire comments, some of the resources needed include land, steady availability of cargoes; investment in logistical networks, skilled labour force and privatisation. It is pertinent that an objective evaluation of resources and challenges of offering value-adding services (VAS) be carried out.

In this regards, some questions requiring careful answers include: Are the services really tailored to port users' needs? What are the possible reactions of our competitors? To what degree do governments, pressure groups and other stakeholders influence the projects? For example, a development project of Dibden Bay by ABP ports in Southampton (UK) did not materialise as a result of legal protest by environmental friendly pressure groups (NFDC, 2001).

In a quest to understand necessary steps in developing and offering of value-adding services, port management opinions during the interviews include:

*‘...identifying and putting in place robust structures to support Research and Development (R&D); to explore the market and chart commercial policies to tap into the market’ (Port Manager, NPA Port Harcourt).*

*‘.....and sometimes the problems of these projects can be the fact that you don’t get a long enough contract from the customers to justify the skills and investments required’ (Business Development Manager, ABP, Port of Hull).*

These factual statements of port managers’ point to the crucial needs to, in the first instance, comb and explore the immediate and extended port market. This necessitates setting up organised research unit(s) whose investigations can support the port in tapping into market opportunities with regards to developing relevant value-adding services. On the other hand, the need to secure or plan for long term contracts can not be overemphasised. It implies therefore, that a viable value-adding service, with stakeholders interested in long term contract, should be given development and investment priority.

### **Driving Strategy in Landlord-Operators Port Model**

Given the results of changes in market, ports adapt their structures and strategies in order to retain competitive positions (Cetin and Cerit, 2010). As more and more private operators enter into the port business by either full port privatisation or via the landlord-operator’s model of port concession, it becomes increasingly important to understand how and who drives the port’s strategies. In the case of a fully privatised port, it is clear that strategizing for the port’s growth is the core responsibility of the port management. On the other hand, for a landlord-operator’s port model, discussions during interviews with port management increasingly reflected views that the responsibilities of strategy concerning attracting and retaining customers and businesses of a port has greatly passed on to port/terminal operators.

Nonetheless, the following port management opinion is worth consideration:

*'... as landlords would normally want to make sure that things are done right in their houses, so also as landlords in the port we also would want things to be done right in the port. The tenant is not the owner of the house; as such the responsibility will not be left just for the terminal operators. There is therefore symbiotic actions and relationship from both sides of landlords and operators' (Assistant Chief Port Strategist, Apapa Port).*

This excerpt confirmed that there are great expectations and responsibilities on terminal and/or port operators (tenants) in any particular port. However, it goes to emphasise that Port Authorities as responsible landlords should not relent on pursuing growth strides of the port. Attention to this statement becomes even more important since port/terminal operators usually operate within specified contract duration, with the possibility that such operation agreement might not be renewed. This line of thought is supported by Baird (2002), who held that although there is a significant participation of private sector in port operations and services, yet the public sector takes more than just a passive interest in the port system.

To buttress the need for port authority's proactive involvement, it is worthwhile to have the view that as long as the port landlord-operator's model continues, then there exists the likelihood of having changes in operators but port landlords will remain the same. While discussing port privatisation and competitiveness, Tongzon and Heng (2005) cited that the Port of Singapore Authority (PSA) lost two major clients, and stressed that success in the 21<sup>st</sup> century seaport is hinged on Port Authorities being customer-focused and possessing the ability to realize important market trends. Given the statutory structure of a landlord-operator port model, the growth of ports should be spurred by active joint efforts of both the landlords and operators. For instance, the consideration of value-adding services in a port's strategy can be jointly initiated and assessed by Port Authorities and operator(s), with a profound understanding of the needs of other customers (port users).

## 7.8 Port Value-adding Services (VAS) Strategy Model

In order to achieve research aim 6 (section 1.4), a new port VAS model, in addition to the other one developed in section 2.8 (figure 2.5), is hereby presented as supportive tool to enable port management to make informed decisions while considering value-adding services (VAS) in the strategy of ports. This type of model is in the form of models discussed by Lunn et al. (1986) as fundamentally modelling how things work or in other words how things can be made possible. For an objective use of the stepwise port VAS model (figure 7.2), the table 7.10 presents some of the core parameters that should form the basis for ‘practicability’ study and assessments to reach informed decision of the type of value-adding services to offer at a given time.

Table 7.10: VAS port model table

	I	II	III	IV	V
Service	Availability	Relevant Resource base	VAS Importance	VAS Usage level	Contract duration
VAS	*Available	* High	* High	* High	* Long term
‘A’, ‘B’	*Not	* Low	* Low	* Low	* Medium
or ‘C’	available	* Moderate	* Moderate	* Moderate	* Short term

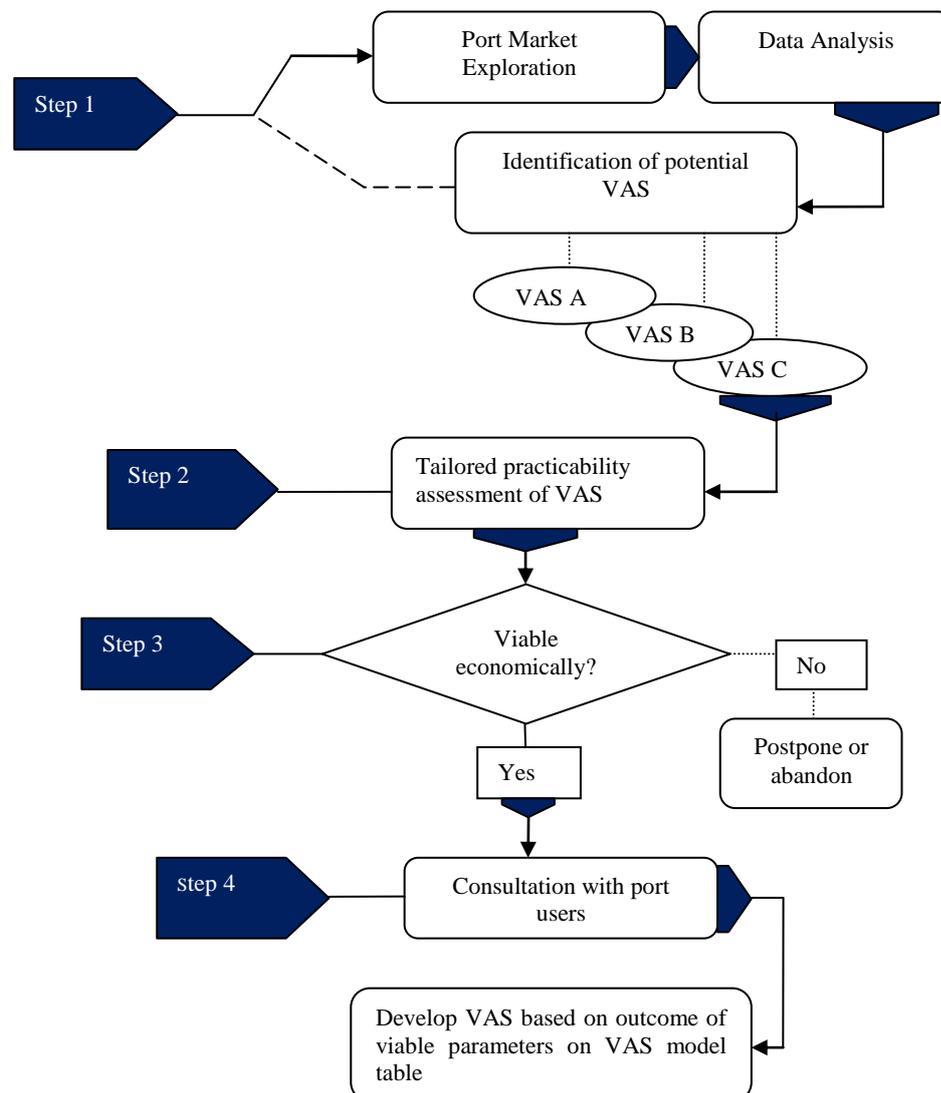


Figure 7. 2: Port VAS Strategy Model (Source: Author)

The port VAS model is based on ideas and results of this study concerning issues and steps in offering VAS, and other factors such as VAS availability, importance, usage and contracts. For example, it should be assessed whether the resource base to offer 'VAS A' is high, low or moderate. The stepwise model is further discussed below.

**Step 1- Port market exploration & analysis:** Port management should carry out an exploration and analysis of the port market with a view to understanding the potential needs of port users. For example, the availability or non-availability of various value-adding services should be investigated at this stage.

**Step 2 - Identification of value-adding services:** Identification of specific potential value-adding services (e.g advertisement support) for development follows, as enabled by step (1) above and preliminary opinion sample of port users. In some cases, potential value-adding services can be identified directly without rigorous port market exploration and analysis (as illustrated by the dashed connecting line on figure 7.2). Identification of value-adding services that are entirely new in port business would require more developmental attention.

**Step 3 - Resource base assessment:** Given the type of VAS in consideration, a thorough assessment of resources needed to offer the service(s) should be carried out. This allows for the port to take stock of both short and long term resource requirements necessary for developing and offering of the VAS in question. Direct and indirect benefits and the overall economic viability of the service(s) are assessed. Assessment of the relevant port resource portfolio will help determine whether the project should be taken to the next level, postponed or abandoned.

**Step 4 - Consultation:** Survey, followed by detailed consultation with port users about the particular value-adding service (s) is the next necessary step. Based on the outcomes of parameters on the VAS model table (7.10), at the consultation stage more deliberation of the value-adding service(s) should take place, on which basis decision to develop and offer service(s) might be reached. Note that parameters in the table 7.10 are issues of value-adding services as discussed in this study.

On both the port and port users' side, making necessary trade-offs is very important in reaching decisions to develop and offer value-adding services. However, high level of importance, consistent usage, availability of needed resource base and long term contract are often positive indications for having a competitive offering of value-adding service(s).

Some other guidelines/ tips for a worthwhile VAS strategy in ports are:

- Source of synergy for core services
- Non-competitive with core services
- Means of clear differentiation
- Could sometimes be stand alone

In addition to these characteristics, some other useful ideas gathered from port-user respondents and port management interviews include that VAS should be financially affordable and actually tailored to meeting customers' specific needs. Rather than a summative end product, the model is only part of other previously discussed outcomes of this research to evaluate and facilitate strategy formulation in ports by value-adding services.

## **7.9 Summary**

As an overall summary, this chapter provided opportunity for an in-depth examination and discussion of very important research issues, such as, port management opinions of value-adding services, evaluation of port selection criteria and value-adding services potential in port strategy. Interview results with port management largely supported the research proposition that 'value-adding services can form a strong means for competitive differentiation to attract port users'. Also it was shown that some of the areas of challenges and relevant resources necessary for the offering of value-adding services include government and stakeholders' issues, securing long term contract and land availability. Port location, cargo handling equipment, tidal variations and skilled manpower correspondingly emerged as the top ranked port selection criteria.

Based on interrelatedness, factor analysis supported the categorization of port selection criteria into four groupings: port logistics operations facilitation, administrative/management related facilitation, hinterland related attributes and port fundamentals.

Based on ideas and discussions of results in this study, a new 'Port VAS strategy model' was developed as a stepwise guide for the evaluation and facilitation of value-adding services strategy in ports. Value-adding services were found to have suitable potential in the formulation of port strategy and can also provide needed platforms for diversification of port business.

The evaluation of results from both chi-square and Fisher's tests, as supported by port management opinions from interviews, provided the platform for accepting both set propositions that 'the patronage level to a port by port-users is associated with the value-adding services obtainable from that port' and 'the capacity of a port to retain port-users is associated with the value-adding services obtainable from that port'. While the extent of offering value-adding services in Rotterdam and PD Teesport ports was found to be at considerably high levels, it was largely between moderate and considerable levels for Apapa and Damietta ports respectively.

The level of port users' value-adding services awareness was higher in Rotterdam and PD Teeport ports than that of those in Damietta and Apapa. However, there was a very adequate level of awareness necessary for consideration and development of value-adding services strategy in all the ports.

## **Chapter 8 - Conclusions**

### **8.1 Introduction**

This research project was mainly founded on the aim to contribute to existing knowledge in the maritime logistics area, primarily by examining the potential of deploying value-adding services in port strategy development. Findings from the review of literature showed there was a dearth of available empirical works that have particularly investigated the competitive capacity of value-adding services in the formulation of port strategy. Shortage of works in this topical area is believed to be connected with the fact that value-adding services in ports and logistics is a newly evolving subject, with many ports having businesses concentrated on traditional port services. Hence, the development of models, useful to understanding and assessing the capacity of value-adding services in port strategies became necessary to bridge this knowledge gap. This necessitated the developments and contributions of this study.

Because of the versatility of value-adding services, the research involved case study ports situated in different geographical locations, which include Apapa (Nigeria) and Damietta (Egypt) in developing economies, Rotterdam (The Netherlands) and PD Teesport (United Kingdom) in developed economies. The multiple case study approach adopted in this study was to support a robust understanding of value-adding services as offered in ports of different regions and economies.

In essence, findings were based on results and inferences from data gathered through a questionnaire survey of port-user companies, interviews with port management and the literature, as analysed and discussed. As many ports experience unprecedented competition, novel port value-adding services models have been developed in this study to enhance understanding and facilitate informed decision making while assessing the potential of value-adding services in competitive strategy of a port.

The aim of this chapter is to summarise all aspects of the findings in accordance with the research aims as set out in section 1.3.2. Contributions of this research to existing knowledge in the maritime logistics area are also discussed. Since the present research

is focused on the potential of value-adding services as an aggregate, as opposed to a particular value-adding service, future research areas are proposed.

## **8.2 The Research Discussions**

The goal to assess the capacity of value-adding services in a port's strategy necessitated commencement of the research by an in-depth review of the literature. Findings from the literature enabled the differentiation of 'value-adding services' from other 'value-added' inclinations (see section 2.8.1). As a way of reiteration, value-adding services in the context of this research represent additional and complementary services, which are different from the core services of a firm, as discussed by Bowersox and Closs (1996) and Christopher (2005). With regards to ports, value-adding services identified in this area are transport services, warehousing, packaging, consultancy, advertisement support, assembly of cargo, canteen/catering, cold storage and water supplies

Despite the popular view that the use of logistical value-adding services could be a means to differentiate a firm for competitive advantage, findings in the literature revealed a dearth of available documentation that have assessed this acclaimed potential in the area of port strategy. Related important publications in this area include Pettit and Beresford (2009), Ugboma et al. (2004), Bichou and Gray (2004). However their respective assessments were concerned with several port services/attributes and various port performance measurement criteria, which did not allow for a holistic examination of value-adding services' worth in port strategy. As a result of this scenario, this study was embarked upon. This study examined this evolving area by particularly assessing the potential of value-adding services in the strategy of ports.

### **8.3 Research Perspective & Methodology**

Whereas ontology has to do with what is accepted to constitute reality in a given research area, epistemology is concerned with fundamental assumptions that are to be followed consistently in the development of knowledge. The epistemological and ontological bases of this study took the critical realist approach to understanding reality. The main reason for this approach was to enable the utilisation of a robust research strategy, involving quantitative and qualitative, deductive and inductive, objective and subjective methodologies.

The use of case studies while carrying out investigations has proved to be a veritable means to achieve the set aims in research. Multiple case study ports were used in this research in order to allow for an in-depth understanding of value-adding services. The ports are Nigerian Apapa port and Egyptian Damietta port, which are both major ports situated in developing economies, while The Netherlands' Rotterdam port and United Kingdom's PD Teesport are leading ports situated in developed economies.

Surveying the opinions of a total of one hundred and eleven (111) managers and senior personnel from port-user companies in the four case study ports formed the principal source of primary data from the industry. The surveying method employed validated semi-structured questionnaire. In addition, information from literature review and interviews with port management of the case study ports supported the triangulation of research data sources, contributing to elucidation of various issues on value-adding services in port strategy.

### **8.4 Achievement of Research Aims and Objectives**

On the basis of findings from the literature and the decision to use a case study ports approach, as discussed, the research aims and objectives set out in chapter one (section 1.32) gave directions for the study. The achievement of these research aims and objectives are hereby summarised under headings and subheadings that follows.

## **8.5 Exploration and understanding of value-adding services concept**

Exploration of the knowledge and perspectives of value-adding services concept is the research aim number one. In achieving this aim, the study made a contribution to knowledge by supporting understanding of the meaning of ‘service’, while distinguishing some fundamental features of ‘value-added’ and ‘value-adding services’ concepts based on findings from the literature (see section 2.8).

Whereas it was found in the literature that ‘service’ is the offer of an industrial sector that does things as opposed to the making of things, it was further expounded in this study (section 2.7) that there can be simple or multiple-constituent services based on the processes involved in meeting customer requirements. On the other hand, while the ‘value-added’ terminology or concept was found to have been used to represent varied issues such as incremental processes, cost to benefit outcomes and management styles, ‘value-adding services’ as used in this study, were distinguished to represent supplementary or additional services, which complement the core offers or services.

## **8.6 Deployment of value-adding services in ports of developing and developed economies**

Another important aspect of investigation in this study is concerned with examining the manner and extent of deploying value-adding services in the different ports situated in developing and developed economies. Findings as summarised in this section mainly fulfil the research aim number 2 and partly number 1, and are presented under the following headings:

### **8.6.1 Availability of value-adding services**

Value-adding services were found to be available in all the case study ports. It is expedient to observe that according to port users’ opinions, value-adding services’ availability was much more pronounced in the ports of the developed economies, than was obtainable in the ports of the developing economies.

In the developing economies' ports, the services indicated to be available by most port users in Damietta port and Apapa port are warehousing and water supplies services respectively. For ports situated in the developed economies' ports of Rotterdam and PD Teesport, transport service emerged as the most available, according to majority of port users.

Third party logistics (3PL) companies were found to be actively involved in the provision of value-adding services. Findings showed that in some circumstances, ports offer the services directly; and in others, ports outsource or provide the necessary facilities for other companies to offer value-adding services. An excerpt from an interview with port management, held that:

*'We will get involved in cargo handling activities where it makes sense, but it is unlikely that ABP itself will get involved in the bolt-on activities, but we can make it possible by providing land for some other companies to do that on the port' (Business Development Manager, ABP, Port of Hull).*

Value-adding services, referred to in the statement as 'bolt-on activities' are much more likely to be offered by other companies in the port. This statement stands true for many ports proactively involved in making value-adding services available to port users by the use of third party logistics (3PL). Consequent upon the surging increase in the operations of many ports as a result of gains in economy of scale by the use of larger ships and gigantic superstructures, there has been a rise in 3PLs' hunt for involvement in port value-adding services. Third party logistics companies' involvement in ports is expected to continue increasing as more ports choose to use value-adding services in port's strategy.

### **8.6.2 The extent of deploying value-adding services in ports**

Deployment of value-adding services was generally found to be higher in ports of the developed economies than was the case for ports of the developing economies. In effect therefore, the services are offered more readily in the case study ports of the developed economies. For the ports of the developing economies, while value-adding services emerged to be considerably offered in the Damietta Egyptian port, the services are moderately offered in the Nigerian Apapa port. By implication, findings

thus showed there exists potential business opportunities in considering offering of value-adding services in ports' strategies, particularly in the developing economies.

### **8.6.3 Awareness of value-adding services**

Contrary to being decisive objection, high inertia by ports management and port-user companies to respond to some innovations, for example in relation to value-adding services, could be as a result of their level of awareness. In the Rotterdam port and PD Teesport, it was found that the level of port users' awareness of value-adding services was higher in comparison to those of the port users in the two developing economies' ports.

An input from port management that is worth recalling held that:

*“...life itself is competitive. VAS is offered for competitiveness, to do better than others, people tend to change to respond to different challenges” (Assistant Chief Port Strategist, Apapa Port).*

This statement reinforced the need for port management and port users to be willing to make necessary changes, learn and embrace new trends as necessary. In this light therefore, the originality of study is again seen in the area of raising the profile of knowledge among port managers and port users about value-adding services in port strategy. However, it was deemed important to emphasise that the level of port practitioners' awareness of the services, as found in this study, was adequate for the development of value-adding services in ports.

### **8.7 Evaluation of port users' port selection criteria**

Nineteen (19) port selection criteria as identified in this study were ranked by port users according to their importance in deciding on which port to patronize. This is particularly to fulfil research aim number 3 as outlined in section 1.3.2, which is concerned with carrying out an investigative evaluation of rationales for port users' selection of ports. Among the selection criteria that emerged as most important for port users' decision include port location, cargo handling equipment, tidal variations and service quality.

Findings, through the process of factor analysis, showed that there are four principal groupings of factors for consideration in port users' selection of ports. These are namely port logistics operations facilitation, administrative/management related facilitation, hinterland features and port fundamentals. Value-adding services emerged in the middle of the ranking, showing that the services are of moderate importance in port-users' port selection criteria.

Although value-adding services were not ranked in the very top amongst criteria for selection of ports, the services were found to be integral parts of both 'port logistics operations facilitation' and 'administrative/management related facilitation' factors. This, therefore, indicated that value-adding services have versatile underlying potentials. While these outcomes are supported by UNESCAP (2003), Bichou and Gray (2004) suggestion that value-adding services have beneficial direction for the port business, it contradicted Ugboma et al.'s (2004) indications that the services ranked low in port-service attributes.

### **8.8 Assessment of value-adding services' competitiveness in port**

The competitiveness of a particular service or group of services would greatly depend on their usefulness as assessed by the customers, in this case port users who will ultimately be the consumers of the services. Hence, the following subheadings present port users' opinions of the services, channelled towards meeting research aim number 4, to assess the suitability of value-adding services as a means for ports competitiveness.

### **8.9 Potential usage of value-adding services**

Port users in the case study ports of the developing economies were predominantly more enthusiastic about using most of the examined value-adding services than their counterparts in the developed economies, if the services were provided by the ports. An important observation in regards to this outcome was that value-adding services have existed in ports of the developed economies for a relatively long period of time,

while the services are generally in early stages in the ports of the developing economies.

In general, transport and warehousing services were rated as the most desired among port users in ports of the developed economies. While technical support and transport services emerged as most desired for the Egyptian port users; transport, technical support and warehousing were correspondingly graded as the most desired services for the Nigerian port users.

### **8.10 Importance of value-adding services**

For the purpose of strategy, understanding the intrinsic importance of value-adding services to port users' businesses is considered to be crucial. Findings showed that at varying degrees, each of the ten identified key value-adding services received substantial ranking of importance. Overall however, the most important value-adding services according to results of data from port users are correspondingly transport service, warehousing, water supplies and technical support. The least important services to port users are advertising support and canteen/catering services.

Whereas assembly of cargo emerged to be the most important value-adding service for port users in the Egyptian Damietta port, for their counterparts in the Nigerian Apapa port, water supplies service was considered to be the most important. On the other hand, port users in The Netherland's Rotterdam and United Kingdom's PD Teesport ports identified transport service as the most important of all the value-adding services.

A possible explanation for these results is the understanding that markets in the developed economies have attained stages where speedy response to customers demand for goods and services has become a crucial aspect for business success. Hence, efficient transport services to the market have become very important for port users. The QR (Quick Response) logistics concept, which advocates readily and proactively meeting customers' needs as quickly as possible (Fernie and Sparks, 2004) further substantiates this view.

It might be pertinent to observe that hitherto, there has been neglect in ranking value-adding services in ports, with a near non-existence of publications that have graded these services according to importance. Hence, it is expected that findings from this study concerning the importance of the different value-adding services in ports would furnish both the academia and industry with invaluable insights on the importance port users attach to these value-adding services.

### **8.11 Influences on port management in strategy formulation**

In the contemporary port system, the pressures of short and long term business development issues have made strategy formulation more and more complex. In an attempt to fulfil research aim number 6, assessing and understanding the influences on port management in strategy formulation was considered to be very important. As gathered mainly from managers of case study ports in developing and developed economies, among these influencing issues include legislation, availability of traffic (cargo and vessel) for short and long term contracts, economic viability of projects, competitors' influence, personnel, adequate land and space availability.

For many ports, the trend towards having a hub port or portcentric logistics status, has led to an ever increasing pressure on the availability and management of land. Hence, the formulation of port strategies is significantly affected by land resources, and this is particularly considered as a challenge in the development and offering of value-adding services in ports. In a related manner, the issue of land availability and usage is interlinked with port location which in turn largely determines the hinterland of a port.

Although other means are worth consideration in offering value-adding services in ports, the constraints posed by limited land resource within a port's vicinity can be solved by the use of dedicated areas offsite of the port, as in cases where dry-ports have been developed. However, effective mechanisms should be put in place to ensure there is a responsive integration between the port and value-adding services' areas, so as to facilitate smooth flow of materials and related information.

### **8.12 Employability of value-adding services in port's strategy**

Value-adding services have been shown in section 7.7 to possess significant prospects as a competitive means of attracting and retaining port users to a port. This conclusion was based on the opinions of customers (port users), who naturally are the predominant stakeholders to be considered in the formulation of strategy. However, at the moment there exist greater possibilities that value-adding services would be more competitively productive in ports of the developing economies, than is the case for those in the developed economies where the services have existed for some time.

Even in situations where value-adding services cannot be used for strong competitive differentiation of ports, they were found to have the capacity to provide necessary foundations for diversification of business for port authorities and port operators. It is predicted that in the future there would be more and more ports leaving their shores to acquire and manage ports in other nations, and as competition get more intensified, diversification of services would increasingly be a necessary option for consideration. However, it is crucial to state that apart from having certain prerequisite resources for the development and deployment of value-adding services in ports, there were various challenges discovered concerning offering of the services. These include the impact of external influences (section 7.2), the ability to adequately tailor services to customers' needs and reaction or copying by competitors.

There is dynamism in the deployment of value-adding services as a strategy. Trends in findings showed that over time, a diminishing effect tends to set in, whereby value-adding services would be regarded as basic offers or services. Thus, port management should always devise a means to sustain the desirability of value-adding services as being unique and special to port users.

### **8.13 Research Propositions: Association of VAS to attraction & retention of port users**

Concerning the potential of value-adding services to attract and retain port users to a port, the opinion of port users (in both developed and developing economies) showed a significant yearning to use ports that, in addition to the core services, also offer

value-adding services. In this regards, the two propositions tested by data from port users' opinions yielded results that formed the basis for the acceptance of the propositions (refer to section 7.4). The first accepted is *'the patronage level to a port by port-users is associated with the value-adding services obtainable from that port'*. The second accepted is *'the capacity of a port to retain port-users is associated with the value-adding services obtainable from that port'*.

Similarly, the majority of port managers and senior personnel (6 out of the 8) indicated that value-adding services are both capable of attracting and retaining port users in ports (see section 7.2). In recognition of value-adding services' capacity, statements were made to the fact that the services are likened to an 'idea- based' way of business transaction. In this perspective, the implication is that ports must be prepared to think outside the box of merely being traditional custodians of transit cargoes, to becoming proactive generators of additional services that would impact not just the cargoes, but also other areas of port users' businesses. Given these outcomes, it was established that value-adding services have the capacity to attract port users to a port and also to retain port users to continually use a port.

#### **8.14 Port VAS Strategy Model**

The first value-adding service model (section 2.9) provided a theoretical framework to enable a clear understanding of a typical port's core traditional services and value-adding services. The model will be useful in academia, as well as industry in getting acquainted and understanding of port value-adding services. The second model 'port value-adding services model' (section 7.8) presented a stepwise guidance in making informed decisions on the viability of offering value-adding services as means for competitive strategy. While this is not merely a quantitative model, but allows for reasonable experience based subjective input, some of the parameters worth assessing are the importance of value-adding services to port users, availability of required resources, usage frequency and duration of contract. These parameters could be low, moderate or high, as presented in table 7.10. It is to be noted that this study examined these parameters. If the parameters tend to be high in a given assessment, then there is a positive indication to the offering of that particular value-adding service in question.

### **8.15 Evaluation of Research**

- A critical realist approach to understanding reality was adopted, involving both quantitative and qualitative research strategies.
- Data by which models were built and the models themselves were validated by computational techniques and experts in both the port industry and academia. It is however important to note that the models should be used with a level of flexibility that will allow for the input of experience.
- Findings were based on successful engagement of ports, particularly the four (4) case study ports as discussed in the research. Whilst these ports represent a wide range of global ports and findings can be applicable to other ports, if more case study ports were used, it is expected that only a negligible change will be obtained. Processes leading to changes should be subjected to evaluation.
- Outcomes based on these case study ports can also be adopted by other ports in strategy formulation. This is because findings from this study are consistent with Bowersox and Closs (1996) and Christopher (2005) views on the potential of value-adding services in a firm and also supported by few other studies (e.g. UNCTAD,1992; Anderson et al., 2008; Bichou and Gray, 2004, UNESCAP, 2003) that have acknowledged value-adding services and other wide-ranging issues in ports.

### **8.16 Research Contributions to knowledge**

- Theoretical port value-adding services model developed in this study presented a platform for easy comprehension of typical port's core services and value-adding services. The model serves to enhance learning in maritime logistics area both in the academia and industry. It also provided a foundation upon which future customised value-adding services can be built.
- The 'Port VAS Model' is a stepwise practical model, useful as a guide for both port authorities and port users in facilitating objective assessment and consideration of value-adding services in port's competitive strategy.

- Focused empirical examination has been given to understanding the potential of logistics' value-adding services concept in making and keeping ports strategically competitive.
- Key value-adding services in port logistics have been identified and ranked according to importance by service users. Thus, outcomes provided veritable insights, useful in determining services to deploy in strategy per time.

### **8.17 Study Limitation and Further Research Opportunities**

One limitation of the study is that though there are other means of gaining competitive strategy, it focused only on the use of value-adding services. Also the investigation covered examination of the potential of value-adding services as an aggregate. As a result, foreseeable areas of further research include:

- I. To carry out discrete (i.e. per service) further investigations for particular value-adding service (s) of interest, with the view of implementing the same in ports and other business areas of the maritime sector.
- II. To examine the impacts of the presence or absence of value-adding services in a port on the operations of various supply chain segments (e.g. the sea leg transportation, destination ports, DCs, 3PL's business, customers and consumers).
- III. To investigate – 'The Role of value-adding services in a port's capture and development of Hinterlands for traffic sustainability'.
- IV. In relation to maritime port industry, investigation can be carried out to compare how value-adding services can contribute to the strategies of different other modes of transport (rail, land and air). It is known that these other modes have greatly competed for maritime transport bound cargoes and traffic.

Thus it is particularly important to continually carry out research in this area because of:

- The dynamism in strategy requirements.
- There are no definite list of value-adding services, but are based on innovation

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Transport & Logistics Division,  
Huddersfield, HD1 3DH  
United Kingdom

Dear Sir/Madam,

**A Questionnaire On ‘Value-Adding Services as Competitive Strategy: A Multiple Case-Study Analysis of Ports in Developing and Developed Economies’**

This questionnaire is a major part of my PhD research project to understand the views of port users about the use of value-adding services as a competitive strategy.

Your responses are crucial to reaching a full understanding of the research topic. Names and addresses of respondents are not required as you will notice; hence you can be assured you are free to give your opinion and all information provided will be treated with strict confidence. It will take about 10 minutes to complete and am sure you will find it interesting.

Please, the completed questionnaires will be collected on the (Date.....). Alternatively, you can return it if completed before the date using the enclosed pre-paid envelop or by email for the electronic version.

If you have any queries or would like to contact me for further information, please feel free to use my email address: [c.okorie@hud.ac.uk](mailto:c.okorie@hud.ac.uk) or Tel:+44(0)1484471854

Thank you in anticipation of your assistance.

Chukwuneke Okorie

**QUESTIONNAIRE**

Section A: Pre-Information

1. Select your company's service(s) in the port?

- (a) Stevedoring  (b) Importing of goods  (c) Freight forwarding   
 (d) Exporting of goods  (e) Shipping services (Lines)   
 (f) Others (Specify). .....

2. What is your job title?.....

3. How many years experience do you have in port business/service(s)?  
 .....

4. In which category is your highest qualification? (please tick)

- (a) Lower than high school  (b) High School  (c) Bachelor degree   
 (d) Post graduate degree (e.g. MA, MSc, MBA, PhD)   
 (e) If you have a certificate or professional qualification, please specify.....

Section B: Features of port services

Note: Value-adding services (VAS) represent services which are special and tailored to customers' (port users) specific needs; they are complementary services different from general services obtainable in any port, like loading, unloading, documentation, piloting etc.

5. Are value adding services (VAS) available in this port?

- (a) Yes  (b) No

5b. If Yes, please list;

.....  
 .....  
 .....

Section B1: Key value-adding services identified in the literature

6. How likely are you to use the following services if they were to be provided by the port? (Please select).

	Very low	Low	Moderate	High	Very High
Transport delivery service	1	2	3	4	5
Warehousing	1	2	3	4	5
Packaging	1	2	3	4	5
Technical expertise support	1	2	3	4	5
Advertisement support Service	1	2	3	4	5
Assembly of products/cargo	1	2	3	4	5
Consultancy service	1	2	3	4	5
Canteen/Catering Service	1	2	3	4	5
Water supplies	1	2	3	4	5
Cold Store Services	1	2	3	4	5

Give your comments .....

.....

.....

7. Are the following value-adding services available in the port? (Select as appropriate).

	Available	Not Available	Not sure		
Transport Delivery/Haulage Services	1	2	3		
Warehousing Services	1	2	3		
Packaging Services	1	2	3		
Technical Expertise Support Services	1	2	3		
Advertisement Support Service	1	2	3		
Assembly of Products/Cargo	1	2	3		
Consultancy Services	1	2	3		
Canteen/Catering Services	1	2	3		
Water Supplies	1	2	3		
Cold Store Services	1	2	3		
Others (specify)	1	2	3		
	1	2	3		
	1	2	3		

\* Give comments based on your choice here

.....

.....

.....

Section C: Features of port users' patronage (select one answer to show your reaction to the statements below).

8. 'Port users would prefer a port that renders value-adding services (VAS)':

Strongly Disagree	Disagree	It makes no difference	Agree	Strongly Agree
1	2	3	4	5

9. Providing value-adding services to port users would make the port:

- 1. More Attractive
- 2. Less Attractive
- 3. Makes No Difference

Give reason(s) for your opinion.....  
 .....  
 .....

10. The provision of value-adding services would result in the port being used:

- (a) More Frequently
- (b) Less Frequently
- (c) Makes No Difference

Give reason (s) your opinion.....  
 .....  
 .....

Section D: Awareness of Value-adding Services (VAS)

11. How would you rate your awareness of value-adding services (VAS)?

No awareness of VAS	Slightly aware of VAS	Moderately aware	Considerably aware of VAS	Very much aware of VAS
1	2	3	4	5

Section E: RATING OF VAS

12. Rank each of the following value-adding services according to their importance to port users.

	Very low	Low	Moderate	High	Very High
Transport Deliver service	1	2	3	4	5
Warehousing Services	1	2	3	4	5
Packaging Services	1	2	3	4	5
Technical expertise support Services	1	2	3	4	5
Advertisement Support Services	1	2	3	4	5
Assembly of Products/Cargo	1	2	3	4	5
Consultancy services	1	2	3	4	5
Canteen/Catering Services	1	2	3	4	5
Water Supplies	1	2	3	4	5
Cold Store Services	1	2	3	4	5
Others (specify)	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5
	1	2	3	4	5

13. Rate the extent of offering value-adding services (VAS) by the port.

	VAS are not in existence	VAS are Scarcely offered	Moderately Offered	Offered Considerably	Offering of VAS is Very High
	1	2	3	4	5

Comments (if any).....  
 .....  
 .....

14. If you would like additional value-adding services to be offered this by port, please list them:.....  
 .....  
 .....

Section F: Criteria for choice of port by port users

15. In your experience, what steps are needed in developing value-adding services?

.....

.....

.....

16. For each of the following port selection criteria, indicate their relative importance in the choice of port by port users:

	Very Low	Low	Moderate	High	Very High
Ports service reliability	1	2	3	4	5
Port Location	1	2	3	4	5
Port charges	1	2	3	4	5
Infrastructure	1	2	3	4	5
Cargo handling equipment	1	2	3	4	5
Value-adding Services (VAS)	1	2	3	4	5
Capital to start transaction with a port	1	2	3	4	5
Stable Legislations	1	2	3	4	5
Management structure of the port (e.g. Landlord – Operator)	1	2	3	4	5
Security	1	2	3	4	5
Number of berths	1	2	3	4	5
Simplified documentation processes	1	2	3	4	5
Skilled manpower	1	2	3	4	5
Service quality	1	2	3	4	5
Inter-modal transport facilitation	1	2	3	4	5
Tide Variations	1	2	3	4	5
Quick response	1	2	3	4	5
Computerised/IT aided operations	1	2	3	4	5
Port Safety	1	2	3	4	5
Others (specify) .....	1	2	3	4	5

17. Do you know about the offering of advertisement support services by ports? (i.e. ports render services to advertise (publicise) the port user's products/services)?

(a) Never heard of such services  (b) Not sure  (c) Very aware of such services

If you have knowledge of advertisement support service offered by ports as in (17) above, please give details:.....

.....  
.....

18. For any other comments.....

.....  
.....

Thank you for finding time to respond to these important questions. Please, do send the questionnaire to me using one of the most appropriate medium (i.e. the enclosed pre-paid envelop or email) or you can keep it to be collected on (Date.....).

Please, feel free to contact me via Email: [c.okorie@hud.ac.uk](mailto:c.okorie@hud.ac.uk) or Tel: +441484471854 for any queries. Once again, thank you.

## Appendix 2 - Interview Schedule



Interview Schedule for the Research Topic:

**‘Value-Adding Services as Competitive Strategy: A Multiple Case-Study Analysis of Ports in Developing and Developed Economies’**

**Researcher (Interviewer)**

Chukwuneke Okorie

**Date:** .....

**Introduction:** Your opinion is very important on the above research topic. This interview is part of my research project to draw relevant data from port management and experienced professionals in the port industry.

All information obtained is confidential and for research purposes only.

If you have any queries or would like to contact me for further information, please feel free to contact me.

Thank you.

Chukwuneke Okorie  
Tel: +441484471854  
Email: [c.okorie@hud.ac.uk](mailto:c.okorie@hud.ac.uk).



**Pre-Information**

- 1. What is your job title?.....
- 2. How many years experience do you have in port business/service(s)?  
.....

**Features of Port Service**

**Note: Value-adding services (VAS) represent services which are special and tailored to customers' (port users) specific needs eg warehousing, consultancy; they are complementary services different from the core/traditional services obtainable in any port, like loading, unloading, documentation, piloting etc.**

- (1) Are there any value-adding services (VAS) in your port or port of interest?  
.....  
.....

(Please specify

.....  
.....  
.....

- (3) What are some of the specific resources needed to enable the offering of value-adding services?  
.....  
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.....  
.....  
.....

**(3a)** For the formulation of strategy in the port, which of the following matches your opinion?

- (A) Value-adding services can form a strong means of differentiation for competitive advantage.
- (B) Value-adding services can be used, but are not a very strong means of gaining competitive advantage.
- (C) Value-adding services cannot be used to differentiate a port for competitive advantage.

**(3b)**For the retention of port users in a port, which one of the following is your opinion?

(A) The offering of value adding services is able to increase the retention of port users in a port

(B) Offering of value adding services is not strong enough to retain port users in the port

(C) Value-adding services cannot be used to retain port users in a port

**(4)** If there are value adding services in your port, why then does your port offer value-adding services?

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.....

**(5)** Would your port or port of interest expect to expand on its value-adding services?

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.....  
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.....  
.....

**(6)** What are the major problems or challenges encountered in offering value-adding services in the port?

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**(7)** What in your opinion would be the key steps in developing value adding services?

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**(8)** What other reasons encourage port users too select a port instead of another?

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(9) What are the recent strategies to keep the port competitive?  
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(10) If your port has a Landlord & Port Operators structure, who drives competitive strategies of the port?  
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FOR ANY OTHER COMMENTS (PLEASE USE THE SPACE):  
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Thank you very much for finding time to give attention to this research interview.  
Please, feel free to contact me via email: [c.okorie@hud.ac.uk](mailto:c.okorie@hud.ac.uk) ; Tel: +441484471854  
for any further information. Once again, thank you.

### Appendix 3- Interview Excerpts

#### Excerpts

‘We also as ABP, about 10 years ago, we bought a cold store and we operate that and I will say that is value added. Another is in our relationship as a Landlord to the port operators;....., they also offer their customers haulage, so they can also deliver the cargoes as well. ABP, we do not necessarily wish get involved in adding value like haulage or packaging or such like. We will get involved in cargo handling activities where it makes sense, but it is unlikely that ABP itself will get involved in the bolton activities, but we can make it possible by providing land for some other companies to do that on the port.’ (Business Development Manager, ABP, Port of Hull)

‘So for VAS, like the Federal government we want to see a situation where customers patronise the ports. They (port operators) have VAS, they compete among themselves to woo customers (port users), and they reduce their tariff, improve facilities & offer warehousing. So they now design what they bring to customers, moreover the cargoes they handle are not the same.’ (‘Anonymous’, NPA Port Harcourt)

#### Attraction

‘Highly depends on the port activities/ positioning of the port. Pure transshipments port does not care about VAS’. (Advisor corporate Strategy, Port of Rotterdam)

‘I will agree with the first that VAS can perform strongly to differentiate ports, because if a port has a lot of land available and another port do not have land available and a customer want to have a large distribution centre built in the port, then the port with large land will have better competitive advantage. Location is important. Yes I will agree with that VAS can give a competitive advantage.’ (Business Development Manager, ABP, Port of Hull)

There is a saying that ‘services that prospered traded in cargo and physical items’. In the future, institutions/firms must be prepared to trade in ideas. ‘Ideas rule the world-the same is true for the port sector’. (Port Manager, NPA Port Harcourt)

## **Retention**

‘If the port management decide that the VAS is important to retain certain cargo/trade flows, they can give incentives to start up VAS companies, and they can take this into account for land lease strategy’ (Advisor corporate Strategy, Port of Rotterdam).

‘This is on a case to case basis, .....because VAS is able to increase retention, but sometimes it is not enough to retain port users in a port. Sometimes port users do not want any VAS, so if they want to go, they will go whether you offer any VAS or not’ (Business Development Manager, ABP, Port of Hull)

‘When the port was wholly run by NPA, it offered haulage services to port users at a lower price rate and saved business time as a result. So the port users, considering the condition of our environment and level of reliability in business, can decide to continue to patronise the port because of availability of such service’

(Assistant Chief Port Strategist, Apapa Port)

## **Why does your port offer VAS?**

‘.....because we are here for business and the more the customers, the better for the system; is better for the company. So if there is anything we can do to add-value to our services & that will attract customers, we will not look back, we will do it. So the reason for offering VAS is to attract more customers which translate to more revenue for us. The more the customers, the more the revenue, better for us, better for the national economy because we are working for the government.’ (‘Anonymous, NPA Port Harcourt)

‘...it is one for profitability. There is no point offering VAS if it can be profitable so you have to view the money element. It may help to tie the business of customers to the port by offering them facilities in the port for VAS. (Business Development Manager, ABP, Port of Hull)

‘“life itself is competitive”’. VAS is offered for competitiveness, to do better than others. People tend to change to respond to different challenges. (Assistant Chief Port Strategist, Apapa Port)

### **Possible Expansion of VAS**

‘Yes. **No doubt we will. We are finding that we are getting more and more involved in activities that do more than just handle a cargo**’. (Business Development Manager, ABP, Port of Hull)

‘Yes,...**this shall come to implementation after research of relevant market**’ (Head of Damietta port operation)

‘It is known that ‘**necessity is the mother of invention. We would want to look at how to do things better to attract more customers**’. (Assistant Chief Port Strategist, Apapa Port)

### **Resources for VAS**

‘now we are regulators & along the line we have to acquire new skills to be able to regulate **because you cannot regulate effectively if you do not know more than or your knowledge base does not exceed that of the people you want to regulate**’. (Port Manager, NPA Port Harcourt)

### **Challenges of VAS**

We find that the port gets quite congested if we dedicate a lot of the land for something that won’t bring a lot of business on the quay side, it may not be the best use of the land. (Business Development Manager, ABP, Port of Hull)

‘.....and sometimes the problems of these projects can be **the fact that you don’t get a long enough contract from the customers to justify the skills and investments required**. (Business Development Manager, ABP, Port of Hull)

As a public corporation, the port might not enjoy the Quick Response flexibility that **private firm enjoys**. Any service we render must be within the statutory provision. (Port Manager, NPA Port Harcourt)

Identifying and putting in place robust structures to support Research and Development (R & D); to explore the market and chart commercial policies to tap into the market (Port Manager, NPA Port Harcourt)

### **Other issues of consideration to offering VAS**

Sometimes the only thing that is quite frustrating is the length of time required to get planning permission to build; that is a general UK policy issue. You want to be able to get it quick; getting planning permission sometimes that can be lengthy. It can take about 1 or 2 years to get land permission, so that is pretty too long. (Business Development Manager, ABP, Port of Hull)

‘..we are in a recession at the moment, a lot of people will move quite quickly if the find it cheap to go to somewhere else’ (Business Development Manager, ABP, Port of Hull)

‘If the tariff (price or amount paid to clear cargoes) are less in the nearby port of Cotonou, then it is likely that people would use the port of lesser charge’.  
(Port Manager, NPA Port Harcourt)

### **Landlord-operator –driver of port**

‘The tenant is not the owner of the house’, as such the responsibility will not be left just for the terminal operators. There is therefore symbiotic actions and relationship from both sides (landlords & port operators).’ (Assistant Chief Port Strategist, Apapa Port)

### **Comments on value-adding services**

I forgot to say that another type of VAS is about NPA security, this is not just about the basic security within and around the port, but going further inland to clear the roads, making them free for port users to transport their freight and gain quick access to the port (Assistant Chief Port Strategist Apapa Port)

### Appendix 4- Results of Statistical Data Exploration from Ports in Developed Economies

**Port Service Area**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Stevedoring	5	13.5	13.5	13.5
Importing	4	10.8	10.8	24.3
Freight Forwarding	4	10.8	10.8	35.1
Exporting	6	16.2	16.2	51.4
Shipping Services	5	13.5	13.5	64.9
Others	13	35.1	35.1	100.0
Total	37	100.0	100.0	

**Highest Qualification Category**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Lower than High School	2	5.4	5.4	5.4
High School	4	10.8	10.8	16.2
Bachelor Degree	17	45.9	45.9	62.2
Post Graduate Degree	11	29.7	29.7	91.9
Others	3	8.1	8.1	100.0
Total	37	100.0	100.0	

**Availability of Value-Adding Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid YES	31	83.8	83.8	83.8
NO	6	16.2	16.2	100.0
Total	37	100.0	100.0	

**Likely Usage Rate- Packaging Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	17	45.9	45.9	45.9
Low	8	21.6	21.6	67.6
Moderate	3	8.1	8.1	75.7
High	3	8.1	8.1	83.8
Very High	6	16.2	16.2	100.0
Total	37	100.0	100.0	

**Likely Usage Rate- Assembly of Cargo/Product Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	16	43.2	43.2	43.2
Low	2	5.4	5.4	48.6
Moderate	7	18.9	18.9	67.6
High	7	18.9	18.9	86.5
Very High	5	13.5	13.5	100.0
Total	37	100.0	100.0	

**Likely Usage Rate- Transport Delivery Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	12	32.4	32.4	32.4
Moderate	7	18.9	18.9	51.4
High	9	24.3	24.3	75.7
Very High	9	24.3	24.3	100.0
Total	37	100.0	100.0	

**Likely Usage Rate- Technical Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	11	29.7	29.7	29.7
Low	5	13.5	13.5	43.2
Moderate	11	29.7	29.7	73.0
High	8	21.6	21.6	94.6
Very High	2	5.4	5.4	100.0
Total	37	100.0	100.0	

**Likely Usage Rate- Consultancy Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	15	40.5	40.5	40.5
Low	7	18.9	18.9	59.5
Moderate	12	32.4	32.4	91.9
High	1	2.7	2.7	94.6
Very High	2	5.4	5.4	100.0
Total	37	100.0	100.0	

**Likely Usage Rate- Warehousing Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	11	29.7	29.7	29.7
Low	2	5.4	5.4	35.1
Moderate	8	21.6	21.6	56.8
High	5	13.5	13.5	70.3
Very High	11	29.7	29.7	100.0
Total	37	100.0	100.0	

**Likely Usage Rate- Canteen/Catering Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	23	62.2	62.2	62.2
Low	8	21.6	21.6	83.8
Moderate	4	10.8	10.8	94.6
Very High	2	5.4	5.4	100.0
Total	37	100.0	100.0	

**Likely Usage Rate- Advertisement Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	12	32.4	32.4	32.4
Low	6	16.2	16.2	48.6
Moderate	12	32.4	32.4	81.1
High	5	13.5	13.5	94.6
Very High	2	5.4	5.4	100.0
Total	37	100.0	100.0	

**Likely Usage Rate- Cold Store Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	16	43.2	43.2	43.2
Low	4	10.8	10.8	54.1
Moderate	13	35.1	35.1	89.2
Very High	4	10.8	10.8	100.0
Total	37	100.0	100.0	

**Likely Usage Rate- Water Supplies Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	18	48.6	48.6	48.6
Low	2	5.4	5.4	54.1
Moderate	7	18.9	18.9	73.0
High	3	8.1	8.1	81.1
Very High	7	18.9	18.9	100.0
Total	37	100.0	100.0	

**Availability Status- Packaging Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	24	64.9	64.9	64.9
Not Available	8	21.6	21.6	86.5
Not Sure	5	13.5	13.5	100.0
Total	37	100.0	100.0	

**Availability Status- Transport Delivery Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	33	89.2	89.2	89.2
Not Available	4	10.8	10.8	100.0
Total	37	100.0	100.0	

**Availability Status- Warehousing Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	31	83.8	83.8	83.8
Not Available	6	16.2	16.2	100.0
Total	37	100.0	100.0	

**Availability Status- Technical Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	26	70.3	70.3	70.3
Not Available	8	21.6	21.6	91.9
Not Sure	3	8.1	8.1	100.0
Total	37	100.0	100.0	

**Availability Status- Advertisement Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	20	54.1	54.1	54.1
Not Available	10	27.0	27.0	81.1
Not Sure	7	18.9	18.9	100.0
Total	37	100.0	100.0	

**Availability Status- Assembly of Cargo/Product Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	28	75.7	75.7	75.7
Not Available	5	13.5	13.5	89.2
Not Sure	4	10.8	10.8	100.0
Total	37	100.0	100.0	

**Availability Status- Assembly of Cargo/Product Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	28	75.7	75.7	75.7
Not Available	5	13.5	13.5	89.2
Not Sure	4	10.8	10.8	100.0
Total	37	100.0	100.0	

**Availability Status- Consultancy Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	23	62.2	62.2	62.2
Not Available	6	16.2	16.2	78.4
Not Sure	8	21.6	21.6	100.0
Total	37	100.0	100.0	

**Availability Status- Cold Store Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	17	45.9	45.9	45.9
Not Available	11	29.7	29.7	75.7
Not Sure	9	24.3	24.3	100.0
Total	37	100.0	100.0	

**Availability Status- Canteen/Catering Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	13	35.1	35.1	35.1
Not Available	21	56.8	56.8	91.9
Not Sure	3	8.1	8.1	100.0
Total	37	100.0	100.0	

**Availability Status- Water Supplies Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	29	78.4	78.4	78.4
Not Available	4	10.8	10.8	89.2
Not Sure	4	10.8	10.8	100.0
Total	37	100.0	100.0	

**Port Users Prefer Value-Adding Service Port**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	1	2.7	2.7	2.7
Disagree	6	16.2	16.2	18.9
Makes no Difference	6	16.2	16.2	35.1
Agree	12	32.4	32.4	67.6
Strongly Agree	12	32.4	32.4	100.0
Total	37	100.0	100.0	

**Impact of Value-Adding Services on Attracting Port Users**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid More Attractive	22	59.5	59.5	59.5
Less Attractive	9	24.3	24.3	83.8
Makes no Difference	6	16.2	16.2	100.0
Total	37	100.0	100.0	

**Port Users' Awareness of Value-Adding Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Slightly Aware of Value-Adding Services	3	8.1	8.1	8.1
Moderately Aware of Value-Adding Services	7	18.9	18.9	27.0
Considerably Aware of Value-Adding Services	15	40.5	40.5	67.6
Very Much Aware of Value-Adding Services	12	32.4	32.4	100.0
Total	37	100.0	100.0	

**Impact of Value-Adding Services on Port Usage Frequency (Retention)**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid More Frequently	21	56.8	56.8	56.8
Less Frequently	9	24.3	24.3	81.1
Makes no Difference	7	18.9	18.9	100.0
Total	37	100.0	100.0	

**Importance to Port Users: Transport Delivery Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	1	2.7	2.7	2.7
Moderate	3	8.1	8.1	10.8
High	12	32.4	32.4	43.2
Very High	21	56.8	56.8	100.0
Total	37	100.0	100.0	

**Importance to Port Users: Warehousing Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	1	2.7	2.7	2.7
Moderate	9	24.3	24.3	27.0
High	17	45.9	45.9	73.0
Very High	10	27.0	27.0	100.0
Total	37	100.0	100.0	

**Importance to Port Users: Packaging Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	2	5.4	5.4	5.4
Low	5	13.5	13.5	18.9
Moderate	17	45.9	45.9	64.9
High	12	32.4	32.4	97.3
Very High	1	2.7	2.7	100.0
Total	37	100.0	100.0	

**Importance to Port Users: Assembly of Cargo/Product Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	3	8.1	8.1	8.1
Low	7	18.9	18.9	27.0
Moderate	17	45.9	45.9	73.0
High	8	21.6	21.6	94.6
Very High	2	5.4	5.4	100.0
Total	37	100.0	100.0	

**Importance to Port Users: Technical Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	2	5.4	5.4	5.4
Low	9	24.3	24.3	29.7
Moderate	13	35.1	35.1	64.9
High	11	29.7	29.7	94.6
Very High	2	5.4	5.4	100.0
Total	37	100.0	100.0	

**Importance to Port Users: Advertisement Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	5	13.5	13.5	13.5
Low	12	32.4	32.4	45.9
Moderate	15	40.5	40.5	86.5
High	5	13.5	13.5	100.0
Total	37	100.0	100.0	

**Importance to Port Users: Consultancy Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	6	16.2	16.2	16.2
Low	11	29.7	29.7	45.9
Moderate	10	27.0	27.0	73.0
High	9	24.3	24.3	97.3
Very High	1	2.7	2.7	100.0
Total	37	100.0	100.0	

**Importance to Port Users: Canteen/Catering Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	11	29.7	29.7	29.7
Low	2	5.4	5.4	35.1
Moderate	8	21.6	21.6	56.8
High	5	13.5	13.5	70.3
Very High	11	29.7	29.7	100.0
Total	37	100.0	100.0	

**Importance to Port Users: Water Supplies Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	3	8.1	8.1	8.1
Low	4	10.8	10.8	18.9
Moderate	7	18.9	18.9	37.8
High	15	40.5	40.5	78.4
Very High	8	21.6	21.6	100.0
Total	37	100.0	100.0	

**Importance to Port Users: Cold Store Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	2	5.4	5.4	5.4
Low	6	16.2	16.2	21.6
Moderate	20	54.1	54.1	75.7
High	6	16.2	16.2	91.9
Very High	3	8.1	8.1	100.0
Total	37	100.0	100.0	

**Extent of Offering Value-Adding Services in the Port**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Value-Adding Services are Scarcely Offered	6	16.2	16.2	16.2
Value-Adding Services are Moderately Offered	7	18.9	18.9	35.1
Value-Adding Services are Offered Considerably	15	40.5	40.5	75.7
Offering of Value-Adding Services is Very High	9	24.3	24.3	100.0
Total	37	100.0	100.0	

**Extent of considering other port selection criteria by port users**

**Port Service Reliability**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	1	2.7	2.7	2.7
Moderate	5	13.5	13.5	16.2
High	16	43.2	43.2	59.5
Very High	15	40.5	40.5	100.0
Total	37	100.0	100.0	

**Port Location**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.7	2.7	2.7
Low	3	8.1	8.1	10.8
Moderate	3	8.1	8.1	18.9
High	10	27.0	27.0	45.9
Very High	20	54.1	54.1	100.0
Total	37	100.0	100.0	

**Infrastructure**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.7	2.7	2.7
Low	2	5.4	5.4	8.1
Moderate	5	13.5	13.5	21.6
High	11	29.7	29.7	51.4
Very High	18	48.6	48.6	100.0
Total	37	100.0	100.0	

**Port Charges**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Moderate	6	16.2	16.2	16.2
High	18	48.6	48.6	64.9
Very High	13	35.1	35.1	100.0
Total	37	100.0	100.0	

**Cargo Handling Equipment**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.7	2.7	2.7
Moderate	4	10.8	10.8	13.5
High	16	43.2	43.2	56.8
Very High	16	43.2	43.2	100.0
Total	37	100.0	100.0	

**Value-Adding Services (VAS)**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	6	16.2	16.2	16.2
Moderate	9	24.3	24.3	40.5
High	13	35.1	35.1	75.7
Very High	9	24.3	24.3	100.0
Total	37	100.0	100.0	

**Capital to Start Business with a Port**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	2	5.4	5.4	5.4
Low	2	5.4	5.4	10.8
Moderate	17	45.9	45.9	56.8
High	14	37.8	37.8	94.6
Very High	2	5.4	5.4	100.0
Total	37	100.0	100.0	

**Security**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Moderate	5	13.5	13.5	13.5
High	19	51.4	51.4	64.9
Very High	13	35.1	35.1	100.0
Total	37	100.0	100.0	

**Stable Legislations**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	2	5.4	5.4	5.4
Moderate	9	24.3	24.3	29.7
High	18	48.6	48.6	78.4
Very High	8	21.6	21.6	100.0
Total	37	100.0	100.0	

**Management Structure of the Port (eg. Landlord-Operator)**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	2	5.4	5.4	5.4
Low	5	13.5	13.5	18.9
Moderate	17	45.9	45.9	64.9
High	7	18.9	18.9	83.8
Very High	6	16.2	16.2	100.0
Total	37	100.0	100.0	

**Number of Births**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	2	5.4	5.4	5.4
Moderate	12	32.4	32.4	37.8
High	16	43.2	43.2	81.1
Very High	7	18.9	18.9	100.0
Total	37	100.0	100.0	

**Simplified Documentation Process**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	1	2.7	2.7	2.7
Moderate	8	21.6	21.6	24.3
High	18	48.6	48.6	73.0
Very High	10	27.0	27.0	100.0
Total	37	100.0	100.0	

**Service Quality**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Moderate	3	8.1	8.1	8.1
High	19	51.4	51.4	59.5
Very High	15	40.5	40.5	100.0
Total	37	100.0	100.0	

**Inter-modal Transport Facilitation**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	1	2.7	2.7	2.7
Moderate	10	27.0	27.0	29.7
High	19	51.4	51.4	81.1
Very High	7	18.9	18.9	100.0
Total	37	100.0	100.0	

**Skilled Manpower**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	1	2.7	2.7	2.7
Moderate	4	10.8	10.8	13.5
High	25	67.6	67.6	81.1
Very High	7	18.9	18.9	100.0
Total	37	100.0	100.0	

**Quick Response**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.7	2.7	2.7
Moderate	4	10.8	10.8	13.5
High	21	56.8	56.8	70.3
Very High	11	29.7	29.7	100.0
Total	37	100.0	100.0	

**Tide Variations**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.7	2.7	2.7
Low	8	21.6	21.6	24.3
Moderate	17	45.9	45.9	70.3
High	8	21.6	21.6	91.9
Very High	3	8.1	8.1	100.0
Total	37	100.0	100.0	

**Port Safety**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Moderate	1	2.7	2.7	2.7
High	14	37.8	37.8	40.5
Very High	22	59.5	59.5	100.0
Total	37	100.0	100.0	

**Computerised/IT aided Operations**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	2	5.4	5.4	5.4
Moderate	2	5.4	5.4	10.8
High	15	40.5	40.5	51.4
Very High	18	48.6	48.6	100.0
Total	37	100.0	100.0	

**Knowledge of Port Advertisement Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Never heard of such Services	9	24.3	24.3	24.3
Not Sure	11	29.7	29.7	54.1
Very Aware of such Services	17	45.9	45.9	100.0
Total	37	100.0	100.0	

**Appendix 5- Results of Data Exploration of Ports in Developing Economies (Egypt)**

Developing Economies (EGYPT)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Developing Economies	35	100.0	100.0	100.0

Port Service Area

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Stevedoring	4	11.4	11.4	11.4
Importing	5	14.3	14.3	25.7
Freight Forwarding	10	28.6	28.6	54.3
Exporting	1	2.9	2.9	57.1
Shipping Services	15	42.9	42.9	100.0
Total	35	100.0	100.0	

Years of Port Business Experience

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 1	3	8.6	11.1	11.1
2	2	5.7	7.4	18.5
3	3	8.6	11.1	29.6
4	4	11.4	14.8	44.4
5	4	11.4	14.8	59.3
7	1	2.9	3.7	63.0
10	3	8.6	11.1	74.1
12	1	2.9	3.7	77.8
15	6	17.1	22.2	100.0
Total	27	77.1	100.0	
Missing System	8	22.9		
Total	35	100.0		

**Availability of Value-Adding Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid YES	23	65.7	65.7	65.7
NO	12	34.3	34.3	100.0
Total	35	100.0	100.0	

**Highest Qualification Category**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid High School	1	2.9	2.9	2.9
Bachelor Degree	23	65.7	65.7	68.6
Post Graduate Degree	11	31.4	31.4	100.0
Total	35	100.0	100.0	

**Likely Usage Rate- Warehousing Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	4	11.4	11.4	11.4
Low	3	8.6	8.6	20.0
Moderate	9	25.7	25.7	45.7
High	19	54.3	54.3	100.0
Total	35	100.0	100.0	

**Likely Usage Rate- Transport Delivery Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	5	14.3	14.3	14.3
Low	3	8.6	8.6	22.9
Moderate	9	25.7	25.7	48.6
High	18	51.4	51.4	100.0
Total	35	100.0	100.0	

**Likely Usage Rate- Packaging Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	4	11.4	11.4	11.4
Low	4	11.4	11.4	22.9
Moderate	9	25.7	25.7	48.6
High	18	51.4	51.4	100.0
Total	35	100.0	100.0	

**Likely Usage Rate- Technical Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	4	11.4	11.4	11.4
Low	3	8.6	8.6	20.0
Moderate	8	22.9	22.9	42.9
High	20	57.1	57.1	100.0
Total	35	100.0	100.0	

**Likely Usage Rate- Assembly of Cargo/Product Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	5	14.3	14.3	14.3
Low	6	17.1	17.1	31.4
Moderate	10	28.6	28.6	60.0
High	13	37.1	37.1	97.1
Very High	1	2.9	2.9	100.0
Total	35	100.0	100.0	

**Likely Usage Rate- Consultancy Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	6	17.1	17.1	17.1
Low	8	22.9	22.9	40.0
Moderate	8	22.9	22.9	62.9
High	12	34.3	34.3	97.1
Very High	1	2.9	2.9	100.0
Total	35	100.0	100.0	

**Likely Usage Rate- Cold Store Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	6	17.1	17.1	17.1
Low	8	22.9	22.9	40.0
Moderate	8	22.9	22.9	62.9
High	13	37.1	37.1	100.0
Total	35	100.0	100.0	

**Likely Usage Rate- Advertisement Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	5	14.3	14.3	14.3
Low	6	17.1	17.1	31.4
Moderate	9	25.7	25.7	57.1
High	14	40.0	40.0	97.1
Very High	1	2.9	2.9	100.0
Total	35	100.0	100.0	

**Likely Usage Rate- Canteen/Catering Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	5	14.3	14.3	14.3
Low	8	22.9	22.9	37.1
Moderate	8	22.9	22.9	60.0
High	13	37.1	37.1	97.1
Very High	1	2.9	2.9	100.0
Total	35	100.0	100.0	

**Likely Usage Rate- Water Supplies Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	6	17.1	17.1	17.1
Low	9	25.7	25.7	42.9
Moderate	7	20.0	20.0	62.9
High	12	34.3	34.3	97.1
Very High	1	2.9	2.9	100.0
Total	35	100.0	100.0	

**Availability Status- Transport Delivery Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	29	82.9	82.9	82.9
Not Available	3	8.6	8.6	91.4
Not Sure	3	8.6	8.6	100.0
Total	35	100.0	100.0	

<b>Availability Status- Packaging Services</b>					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Available	28	80.0	80.0	80.0
	Not Available	4	11.4	11.4	91.4
	Not Sure	3	8.6	8.6	100.0
	Total	35	100.0	100.0	

**Availability Status- Warehousing Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	30	85.7	85.7	85.7
Not Available	2	5.7	5.7	91.4
Not Sure	3	8.6	8.6	100.0
Total	35	100.0	100.0	

**Availability Status- Technical Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	27	77.1	77.1	77.1
Not Available	4	11.4	11.4	88.6
Not Sure	4	11.4	11.4	100.0
Total	35	100.0	100.0	

**Availability Status- Consultancy Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	18	51.4	51.4	51.4
Not Available	6	17.1	17.1	68.6
Not Sure	11	31.4	31.4	100.0
Total	35	100.0	100.0	

**Availability Status- Cold Store Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	15	42.9	42.9	42.9
Not Available	6	17.1	17.1	60.0
Not Sure	14	40.0	40.0	100.0
Total	35	100.0	100.0	

**Availability Status- Canteen/Catering Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	18	51.4	51.4	51.4
Not Available	6	17.1	17.1	68.6
Not Sure	11	31.4	31.4	100.0
Total	35	100.0	100.0	

**Availability Status- Assembly of Cargo/Product Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	17	48.6	48.6	48.6
Not Available	5	14.3	14.3	62.9
Not Sure	13	37.1	37.1	100.0
Total	35	100.0	100.0	

**Availability Status- Advertisement Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	24	68.6	68.6	68.6
Not Available	5	14.3	14.3	82.9
Not Sure	6	17.1	17.1	100.0
Total	35	100.0	100.0	

**Availability Status- Water Supplies Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	16	45.7	45.7	45.7
Not Available	7	20.0	20.0	65.7
Not Sure	12	34.3	34.3	100.0
Total	35	100.0	100.0	

**Importance to Port Users: Transport Delivery Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	2	5.7	5.7	5.7
Moderate	1	2.9	2.9	8.6
High	14	40.0	40.0	48.6
Very High	18	51.4	51.4	100.0
Total	35	100.0	100.0	

**Importance to Port Users: Warehousing Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	2	5.7	5.7	5.7
Moderate	1	2.9	2.9	8.6
High	14	40.0	40.0	48.6
Very High	18	51.4	51.4	100.0
Total	35	100.0	100.0	

**Importance to Port Users: Assembly of Cargo/Product Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.9	2.9	2.9
Low	2	5.7	5.7	8.6
High	11	31.4	31.4	40.0
Very High	21	60.0	60.0	100.0
Total	35	100.0	100.0	

**Importance to Port Users: Technical Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	3	8.6	8.6	8.6
High	16	45.7	45.7	54.3
Very High	16	45.7	45.7	100.0
Total	35	100.0	100.0	

**Importance to Port Users: Packaging Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	2	5.7	5.7	5.7
Moderate	1	2.9	2.9	8.6
High	16	45.7	45.7	54.3
Very High	16	45.7	45.7	100.0
Total	35	100.0	100.0	

**Importance to Port Users: Advertisement Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.9	2.9	2.9
Low	1	2.9	2.9	5.7
Moderate	2	5.7	5.7	11.4
High	15	42.9	42.9	54.3
Very High	16	45.7	45.7	100.0
Total	35	100.0	100.0	

**Importance to Port Users: Consultancy Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.9	2.9	2.9
Low	2	5.7	5.7	8.6
Moderate	3	8.6	8.6	17.1
High	9	25.7	25.7	42.9
Very High	20	57.1	57.1	100.0
Total	35	100.0	100.0	

**Importance to Port Users: Cold Store Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	2	5.7	5.7	5.7
Low	2	5.7	5.7	11.4
Moderate	3	8.6	8.6	20.0
High	11	31.4	31.4	51.4
Very High	17	48.6	48.6	100.0
Total	35	100.0	100.0	

**Importance to Port Users: Canteen/Catering Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.9	2.9	2.9
Low	2	5.7	5.7	8.6
Moderate	4	11.4	11.4	20.0
High	8	22.9	22.9	42.9
Very High	20	57.1	57.1	100.0
Total	35	100.0	100.0	

**Importance to Port Users: Water Supplies Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.9	2.9	2.9
Low	2	5.7	5.7	8.6
Moderate	4	11.4	11.4	20.0
High	10	28.6	28.6	48.6
Very High	18	51.4	51.4	100.0
Total	35	100.0	100.0	

**Port Users Prefer Value-Adding Service Port**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Disagree	1	2.9	2.9	2.9
Makes no Difference	7	20.0	20.0	22.9
Agree	11	31.4	31.4	54.3
Strongly Agree	16	45.7	45.7	100.0
Total	35	100.0	100.0	

**Impact of Value-Adding Services on Port Usage Frequency (Retention)**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid More Frequently	28	80.0	80.0	80.0
Less Frequently	6	17.1	17.1	97.1
Makes no Difference	1	2.9	2.9	100.0
Total	35	100.0	100.0	

**Impact of Value-Adding Services on Attracting Port Users**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid More Attractive	29	82.9	82.9	82.9
Less Attractive	5	14.3	14.3	97.1
Makes no Difference	1	2.9	2.9	100.0
Total	35	100.0	100.0	

**Port Users' Awareness of Value-Adding Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Slightly Aware of Value-Adding Services	2	5.7	5.7	5.7
Moderately Aware of Value-Adding Services	10	28.6	28.6	34.3
Considerably Aware of Value-Adding Services	13	37.1	37.1	71.4
Very Much Aware of Value-Adding Services	10	28.6	28.6	100.0
Total	35	100.0	100.0	

**Extent of considering other port selection criteria port users**

**Port Location**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid High	11	31.4	31.4	31.4
Very High	24	68.6	68.6	100.0
Total	35	100.0	100.0	

**Port Service Reliability**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid High	11	31.4	31.4	31.4
Very High	24	68.6	68.6	100.0
Total	35	100.0	100.0	

**Extent of Offering Value-Adding Services in the Port**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Value-Adding Services are not in Existence	3	8.6	8.6	8.6
Value-Adding Services are Scarcely Offered	2	5.7	5.7	14.3
Value-Adding Services are Moderately Offered	14	40.0	40.0	54.3
Value-Adding Services are Offered Considerably	14	40.0	40.0	94.3
Offering of Value-Adding Services is Very High	2	5.7	5.7	100.0
Total	35	100.0	100.0	

**Cargo Handling Equipment**

	Frequency	Percent	Valid Percent	Cumulative Percent
Moderate	1	2.9	2.9	2.9
Valid High	8	22.9	22.9	25.7
Very High	26	74.3	74.3	100.0
Total	35	100.0	100.0	

**Port Charges**

	Frequency	Percent	Valid Percent	Cumulative Percent
Moderate	1	2.9	2.9	2.9
Valid High	10	28.6	28.6	31.4
Very High	24	68.6	68.6	100.0
Total	35	100.0	100.0	

**Infrastructure**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid High	12	34.3	34.3	34.3
Very High	23	65.7	65.7	100.0
Total	35	100.0	100.0	

**Value-Adding Services (VAS)**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Moderate	3	8.6	8.6	8.6
High	6	17.1	17.1	25.7
Very High	26	74.3	74.3	100.0
Total	35	100.0	100.0	

**Management Structure of the Port (eg. Landlord-Operator)**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	2	5.7	5.7	5.7
Moderate	1	2.9	2.9	8.6
High	10	28.6	28.6	37.1
Very High	22	62.9	62.9	100.0
Total	35	100.0	100.0	

**Capital to Start Business with a Port**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	1	2.9	2.9	2.9
High	7	20.0	20.0	22.9
Very High	27	77.1	77.1	100.0
Total	35	100.0	100.0	

**Security**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	1	2.9	2.9	2.9
Moderate	2	5.7	5.7	8.6
High	12	34.3	34.3	42.9
Very High	20	57.1	57.1	100.0
Total	35	100.0	100.0	

**Stable Legislations**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	1	2.9	2.9	2.9
Moderate	1	2.9	2.9	5.7
High	8	22.9	22.9	28.6
Very High	25	71.4	71.4	100.0
Total	35	100.0	100.0	

**Simplified Documentation Process**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Moderate	4	11.4	11.4	11.4
High	7	20.0	20.0	31.4
Very High	24	68.6	68.6	100.0
Total	35	100.0	100.0	

**Number of Births**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	4	11.4	11.4	11.4
Moderate	5	14.3	14.3	25.7
High	7	20.0	20.0	45.7
Very High	19	54.3	54.3	100.0
Total	35	100.0	100.0	

**Service Quality**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Moderate	1	2.9	2.9	2.9
High	8	22.9	22.9	25.7
Very High	26	74.3	74.3	100.0
Total	35	100.0	100.0	

**Skilled Manpower**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Moderate	2	5.7	5.7	5.7
High	10	28.6	28.6	34.3
Very High	23	65.7	65.7	100.0
Total	35	100.0	100.0	

**Quick Response**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Moderate	1	2.9	2.9	2.9
High	9	25.7	25.7	28.6
Very High	25	71.4	71.4	100.0
Total	35	100.0	100.0	

**Inter-modal Transport Facilitation**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Moderate	2	5.7	5.7	5.7
High	8	22.9	22.9	28.6
Very High	25	71.4	71.4	100.0
Total	35	100.0	100.0	

**Tide Variations**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	1	2.9	2.9	2.9
Moderate	6	17.1	17.1	20.0
High	7	20.0	20.0	40.0
Very High	21	60.0	60.0	100.0
Total	35	100.0	100.0	

**Computerised/IT aided Operations**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Moderate	4	11.4	11.4	11.4
High	11	31.4	31.4	42.9
Very High	20	57.1	57.1	100.0
Total	35	100.0	100.0	

**Port Safety**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid High	11	31.4	31.4	31.4
Very High	24	68.6	68.6	100.0
Total	35	100.0	100.0	

**Knowledge of Port Advertisement Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Never heard of such Services	6	17.1	17.1	17.1
Not Sure	9	25.7	25.7	42.9
Very Aware of such Services	20	57.1	57.1	100.0
Total	35	100.0	100.0	

	Transport Delivery	Warehousing	Packaging	Technical Support	Advertisement Support	Assembly of Cargo/Product	Consultancy	Canteen/Catering	Water Supplies	Cold Storage
Very Low					2.9	2.9	2.9	2.9	2.9	5.7
Low	5.7	5.7	5.7	8.6	2.9	5.7	5.7	5.7	5.7	5.7
Moderate	2.9	2.9	2.9		5.7		8.6	11.4	11.4	8.6
High	40	40	45.7	45.7	42.9	31.4	25.7	22.9	28.6	31.4
Very High	51.4	51.4	45.7	45.7	45.7	60	57.1	57.1	51.4	48.6

**Extent of Offering Value-Adding Services in the Port based on Economies**

			Economies			Total
			Developing Economies (Egypt)	Developed Economies	Developing Economies (Nigeria)	
Extent of offering Value-Adding Services in the Port	Value-Adding Services are not in Existence	Count & % within Economies	3 8.6%	0 .0%	0 .0%	3 2.7%
	Value-Adding Services are Scarcely Offered		2 5.7%	6 16.2%	9 <b>23.1%</b>	17 15.3%
	Value-Adding Services are Moderately Offered		14 <b>40.0%</b>	7 18.9%	20 <b>51.3%</b>	41 <b>36.9%</b>
	Value-Adding Services are Offered Considerably		14 <b>40.0%</b>	15 <b>40.5%</b>	6 15.4%	35 <b>31.5%</b>
	Offering of Value-Adding Services is Very High		2 5.7%	9 <b>24.3%</b>	4 10.3%	15 13.5%
Total	Count	35	37	39	111	
	%	100.0%	100.0%	100.0%	100.0%	
within Economies						

**Appendix 6 - Results of Statistical Data Exploration from Ports in Developing Economies (Nigeria)**

**Port Service Area**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Stevedoring	11	28.2	28.2	28.2
Importing	4	10.3	10.3	38.5
Freight Forwarding	3	7.7	7.7	46.2
Exporting	3	7.7	7.7	53.8
Shipping Services	7	17.9	17.9	71.8
Others	11	28.2	28.2	100.0
Total	39	100.0	100.0	

**Highest Qualification Category**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Lower than High School	1	2.6	2.6	2.6
High School	13	33.3	33.3	35.9
Bachelor Degree	15	38.5	38.5	74.4
Post Graduate Degree	10	25.6	25.6	100.0
Total	39	100.0	100.0	

**Availability of Value-Adding Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid YES	31	79.5	79.5	79.5
NO	8	20.5	20.5	100.0
Total	39	100.0	100.0	

**Likely Usage Rate- Transport Delivery Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	2	5.1	5.1	5.1
Low	3	7.7	7.7	12.8
Moderate	6	15.4	15.4	28.2
High	10	25.6	25.6	53.8
Very High	18	46.2	46.2	100.0
Total	39	100.0	100.0	

**Likely Usage Rate- Warehousing Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	5	12.8	12.8	12.8
Low	3	7.7	7.7	20.5
Moderate	6	15.4	15.4	35.9
High	14	35.9	35.9	71.8
Very High	11	28.2	28.2	100.0
Total	39	100.0	100.0	

**Likely Usage Rate- Packaging Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	9	23.1	23.1	23.1
Low	8	20.5	20.5	43.6
Moderate	9	23.1	23.1	66.7
High	10	25.6	25.6	92.3
Very High	3	7.7	7.7	100.0
Total	39	100.0	100.0	

**Likely Usage Rate- Technical Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	2	5.1	5.1	5.1
Low	4	10.3	10.3	15.4
Moderate	7	17.9	17.9	33.3
High	15	38.5	38.5	71.8
Very High	11	28.2	28.2	100.0
Total	39	100.0	100.0	

**Likely Usage Rate- Consultancy Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	9	23.1	23.1	23.1
Low	8	20.5	20.5	43.6
Moderate	10	25.6	25.6	69.2
High	5	12.8	12.8	82.1
Very High	7	17.9	17.9	100.0
Total	39	100.0	100.0	

**Likely Usage Rate- Advertisement Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	7	17.9	17.9	17.9
Low	10	25.6	25.6	43.6
Moderate	4	10.3	10.3	53.8
High	14	35.9	35.9	89.7
Very High	4	10.3	10.3	100.0
Total	39	100.0	100.0	

**Likely Usage Rate- Canteen/Catering Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	4	10.3	10.3	10.3
Low	6	15.4	15.4	25.6
Moderate	11	28.2	28.2	53.8
High	10	25.6	25.6	79.5
Very High	8	20.5	20.5	100.0
Total	39	100.0	100.0	

**Likely Usage Rate- Assembly of Cargo/Product Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	8	20.5	20.5	20.5
Low	5	12.8	12.8	33.3
Moderate	11	28.2	28.2	61.5
High	7	17.9	17.9	79.5
Very High	8	20.5	20.5	100.0
Total	39	100.0	100.0	

**Likely Usage Rate- Water Supplies Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	5	12.8	12.8	12.8
Low	4	10.3	10.3	23.1
Moderate	12	30.8	30.8	53.8
High	7	17.9	17.9	71.8
Very High	11	28.2	28.2	100.0
Total	39	100.0	100.0	

**Likely Usage Rate- Cold Store Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	12	30.8	30.8	30.8
Low	5	12.8	12.8	43.6
Moderate	10	25.6	25.6	69.2
High	6	15.4	15.4	84.6
Very High	6	15.4	15.4	100.0
Total	39	100.0	100.0	

**Availability Status- Transport Delivery Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	27	69.2	69.2	69.2
Not Available	11	28.2	28.2	97.4
Not Sure	1	2.6	2.6	100.0
Total	39	100.0	100.0	

**Availability Status- Warehousing Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	27	69.2	69.2	69.2
Not Available	9	23.1	23.1	92.3
Not Sure	3	7.7	7.7	100.0
Total	39	100.0	100.0	

**Availability Status- Packaging Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	16	41.0	41.0	41.0
Not Available	13	33.3	33.3	74.4
Not Sure	10	25.6	25.6	100.0
Total	39	100.0	100.0	

**Availability Status- Technical Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	15	38.5	38.5	38.5
Not Available	13	33.3	33.3	71.8
Not Sure	11	28.2	28.2	100.0
Total	39	100.0	100.0	

**Availability Status- Advertisement Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	12	30.8	30.8	30.8
Not Available	16	41.0	41.0	71.8
Not Sure	11	28.2	28.2	100.0
Total	39	100.0	100.0	

**Availability Status- Consultancy Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	14	35.9	35.9	35.9
Not Available	13	33.3	33.3	69.2
Not Sure	12	30.8	30.8	100.0
Total	39	100.0	100.0	

**Availability Status- Assembly of Cargo/Product Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	16	41.0	41.0	41.0
Not Available	13	33.3	33.3	74.4
Not Sure	10	25.6	25.6	100.0
Total	39	100.0	100.0	

**Availability Status- Canteen/Catering Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	29	74.4	74.4	74.4
Not Available	7	17.9	17.9	92.3
Not Sure	3	7.7	7.7	100.0
Total	39	100.0	100.0	

**Availability Status- Water Supplies Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	32	82.1	82.1	82.1
Not Available	3	7.7	7.7	89.7
Not Sure	4	10.3	10.3	100.0
Total	39	100.0	100.0	

**Availability Status- Cold Store Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Available	21	53.8	53.8	53.8
Not Available	7	17.9	17.9	71.8
Not Sure	11	28.2	28.2	100.0
Total	39	100.0	100.0	

**Port Users' Awareness of Value-Adding Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid No Awareness of Value-Adding Services	2	5.1	5.1	5.1
Slightly Aware of Value-Adding Services	2	5.1	5.1	10.3
Moderately Aware of Value-Adding Services	23	59.0	59.0	69.2
Considerably Aware of Value-Adding Services	7	17.9	17.9	87.2
Very Much Aware of Value-Adding Services	5	12.8	12.8	100.0
Total	39	100.0	100.0	

**Port Users Prefer Value-Adding Service Port**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Strongly Disagree	2	5.1	5.1	5.1
Disagree	1	2.6	2.6	7.7
Makes no Difference	8	20.5	20.5	28.2
Agree	14	35.9	35.9	64.1
Strongly Agree	14	35.9	35.9	100.0
Total	39	100.0	100.0	

**Impact of Value-Adding Services on Port Usage Frequency (Retention)**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid More Frequently	28	71.8	71.8	71.8
Less Frequently	6	15.4	15.4	87.2
Makes no Difference	5	12.8	12.8	100.0
Total	39	100.0	100.0	

**Impact of Value-Adding Services on Attracting Port Users**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid More Attractive	32	82.1	82.1	82.1
Less Attractive	3	7.7	7.7	89.7
Makes no Difference	4	10.3	10.3	100.0
Total	39	100.0	100.0	

**Importance to Port Users: Transport Delivery Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.6	2.6	2.6
Moderate	7	17.9	17.9	20.5
High	11	28.2	28.2	48.7
Very High	20	51.3	51.3	100.0
Total	39	100.0	100.0	

**Importance to Port Users: Warehousing Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	3	7.7	7.7	7.7
Low	4	10.3	10.3	17.9
Moderate	9	23.1	23.1	41.0
High	9	23.1	23.1	64.1
Very High	14	35.9	35.9	100.0
Total	39	100.0	100.0	

**Importance to Port Users: Packaging Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	3	7.7	7.7	7.7
Low	9	23.1	23.1	30.8
Moderate	10	25.6	25.6	56.4
High	11	28.2	28.2	84.6
Very High	6	15.4	15.4	100.0
Total	39	100.0	100.0	

**Importance to Port Users: Consultancy Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.6	2.6	2.6
Low	10	25.6	25.6	28.2
Moderate	14	35.9	35.9	64.1
High	11	28.2	28.2	92.3
Very High	3	7.7	7.7	100.0
Total	39	100.0	100.0	

**Importance to Port Users: Advertisement Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	4	10.3	10.3	10.3
Low	11	28.2	28.2	38.5
Moderate	7	17.9	17.9	56.4
High	13	33.3	33.3	89.7
Very High	4	10.3	10.3	100.0
Total	39	100.0	100.0	

**Importance to Port Users: Technical Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.6	2.6	2.6
Low	4	10.3	10.3	12.8
Moderate	11	28.2	28.2	41.0
High	12	30.8	30.8	71.8
Very High	11	28.2	28.2	100.0
Total	39	100.0	100.0	

**Importance to Port Users: Assembly of Cargo/Product Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	4	10.3	10.3	10.3
Low	11	28.2	28.2	38.5
Moderate	9	23.1	23.1	61.5
High	7	17.9	17.9	79.5
Very High	8	20.5	20.5	100.0
Total	39	100.0	100.0	

**Importance to Port Users: Canteen/Catering Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.6	2.6	2.6
Low	7	17.9	17.9	20.5
Moderate	12	30.8	30.8	51.3
High	12	30.8	30.8	82.1
Very High	7	17.9	17.9	100.0
Total	39	100.0	100.0	

**Importance to Port Users: Water Supplies Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.6	2.6	2.6
Low	3	7.7	7.7	10.3
Moderate	10	25.6	25.6	35.9
High	14	35.9	35.9	71.8
Very High	11	28.2	28.2	100.0
Total	39	100.0	100.0	

**Extent of Offering Value-Adding Services in the Port**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Value-Adding Services are Scarcely Offered	9	23.1	23.1	23.1
Value-Adding Services are Moderately Offered	20	51.3	51.3	74.4
Value-Adding Services are Offered Considerably	6	15.4	15.4	89.7
Offering of Value-Adding Services is Very High	4	10.3	10.3	100.0
Total	39	100.0	100.0	

**Importance to Port Users: Cold Store Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	5	12.8	12.8	12.8
Low	7	17.9	17.9	30.8
Moderate	10	25.6	25.6	56.4
High	11	28.2	28.2	84.6
Very High	6	15.4	15.4	100.0
Total	39	100.0	100.0	

## Extent of considering other port selection criteria by port users

**Port Service Reliability**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	5	12.8	12.8	12.8
Moderate	9	23.1	23.1	35.9
High	13	33.3	33.3	69.2
Very High	12	30.8	30.8	100.0
Total	39	100.0	100.0	

**Port Location**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	1	2.6	2.6	2.6
Moderate	7	17.9	17.9	20.5
High	18	46.2	46.2	66.7
Very High	13	33.3	33.3	100.0
Total	39	100.0	100.0	

**Port Charges**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	2	5.1	5.1	5.1
Moderate	6	15.4	15.4	20.5
High	13	33.3	33.3	53.8
Very High	18	46.2	46.2	100.0
Total	39	100.0	100.0	

**Cargo Handling Equipment**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	4	10.3	10.3	10.3
Moderate	8	20.5	20.5	30.8
High	11	28.2	28.2	59.0
Very High	16	41.0	41.0	100.0
Total	39	100.0	100.0	

**Infrastructure**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	3	7.7	7.7	7.7
Low	4	10.3	10.3	17.9
Moderate	6	15.4	15.4	33.3
High	14	35.9	35.9	69.2
Very High	12	30.8	30.8	100.0
Total	39	100.0	100.0	

**Capital to Start Business with a Port**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	3	7.7	7.7	7.7
Low	8	20.5	20.5	28.2
Moderate	14	35.9	35.9	64.1
High	9	23.1	23.1	87.2
Very High	5	12.8	12.8	100.0
Total	39	100.0	100.0	

**Stable Legislations**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	5	12.8	12.8	12.8
Low	5	12.8	12.8	25.6
Moderate	12	30.8	30.8	56.4
High	10	25.6	25.6	82.1
Very High	7	17.9	17.9	100.0
Total	39	100.0	100.0	

**Security**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	3	7.7	7.7	7.7
Low	1	2.6	2.6	10.3
Moderate	8	20.5	20.5	30.8
High	14	35.9	35.9	66.7
Very High	13	33.3	33.3	100.0
Total	39	100.0	100.0	

**Value-Adding Services (VAS)**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	4	10.3	10.3	10.3
Low	6	15.4	15.4	25.6
Moderate	8	20.5	20.5	46.2
High	14	35.9	35.9	82.1
Very High	7	17.9	17.9	100.0
Total	39	100.0	100.0	

**Simplified Documentation Process**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	6	15.4	15.4	15.4
Moderate	5	12.8	12.8	28.2
High	20	51.3	51.3	79.5
Very High	8	20.5	20.5	100.0
Total	39	100.0	100.0	

**Management Structure of the Port (eg. Landlord-Operator)**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	2	5.1	5.1	5.1
Low	3	7.7	7.7	12.8
Moderate	9	23.1	23.1	35.9
High	16	41.0	41.0	76.9
Very High	9	23.1	23.1	100.0
Total	39	100.0	100.0	

**Number of Births**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	5	12.8	12.8	12.8
Moderate	5	12.8	12.8	25.6
High	11	28.2	28.2	53.8
Very High	18	46.2	46.2	100.0
Total	39	100.0	100.0	

**Service Quality**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	2	5.1	5.1	5.1
Low	7	17.9	17.9	23.1
Moderate	9	23.1	23.1	46.2
High	10	25.6	25.6	71.8
Very High	11	28.2	28.2	100.0
Total	39	100.0	100.0	

**Skilled Manpower**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	2	5.1	5.1	5.1
Low	1	2.6	2.6	7.7
Moderate	10	25.6	25.6	33.3
High	14	35.9	35.9	69.2
Very High	12	30.8	30.8	100.0
Total	39	100.0	100.0	

**Inter-modal Transport Facilitation**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	4	10.3	10.3	10.3
Low	6	15.4	15.4	25.6
Moderate	12	30.8	30.8	56.4
High	7	17.9	17.9	74.4
Very High	10	25.6	25.6	100.0
Total	39	100.0	100.0	

**Tide Variations**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	3	7.7	7.7	7.7
Low	7	17.9	17.9	25.6
Moderate	16	41.0	41.0	66.7
High	7	17.9	17.9	84.6
Very High	6	15.4	15.4	100.0
Total	39	100.0	100.0	

**Computerised/IT aided Operations**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	1	2.6	2.6	2.6
Low	8	20.5	20.5	23.1
Moderate	11	28.2	28.2	51.3
High	8	20.5	20.5	71.8
Very High	11	28.2	28.2	100.0
Total	39	100.0	100.0	

**Port Safety**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Low	5	12.8	12.8	12.8
Moderate	8	20.5	20.5	33.3
High	12	30.8	30.8	64.1
Very High	14	35.9	35.9	100.0
Total	39	100.0	100.0	

**Quick Response**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Very Low	2	5.1	5.1	5.1
Low	8	20.5	20.5	25.6
Moderate	7	17.9	17.9	43.6
High	13	33.3	33.3	76.9
Very High	9	23.1	23.1	100.0
Total	39	100.0	100.0	

**Knowledge of Port Advertisement Support Services**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Never heard of such Services	14	35.9	35.9	35.9
Not Sure	10	25.6	25.6	61.5
Very Aware of such Services	15	38.5	38.5	100.0
Total	39	100.0	100.0	

## Appendix 7- Port Service Area, Qualifications and Years in Port Business

Table A: Port Service Area * Highest Qualification Category Crosstabulation								
			Highest Qualification Category					Total
			Lower than High School	High School	Bachelor Degree	Post Graduate Degree	Others	
Port Service Area	Stevedoring	Count	0	5	12	3	0	20
		% of Total	.0%	4.5%	10.8%	2.7%	.0%	18.0%
	Importing	Count	0	4	4	4	1	13
		% of Total	.0%	3.6%	3.6%	3.6%	.9%	11.7%
	Freight Forwarding	Count	0	1	12	4	0	17
		% of Total	.0%	.9%	10.8%	3.6%	.0%	15.3%
	Exporting	Count	1	2	2	3	2	10
% of Total		.9%	1.8%	1.8%	2.7%	1.8%	9.0%	
Shipping Services	Count	1	1	15	10	0	27	
	% of Total	.9%	.9%	<b>13.5%</b>	9.0%	.0%	24.3%	
Others	Count	1	5	10	8	0	24	
	% of Total	.9%	4.5%	9.0%	7.2%	.0%	21.6%	
Total		Count	3	18	55	32	3	111
		% of Total	2.7%	16.2%	<b>49.5%</b>	28.8%	2.7%	100.0%

### Port Service Areas and Port Qualification

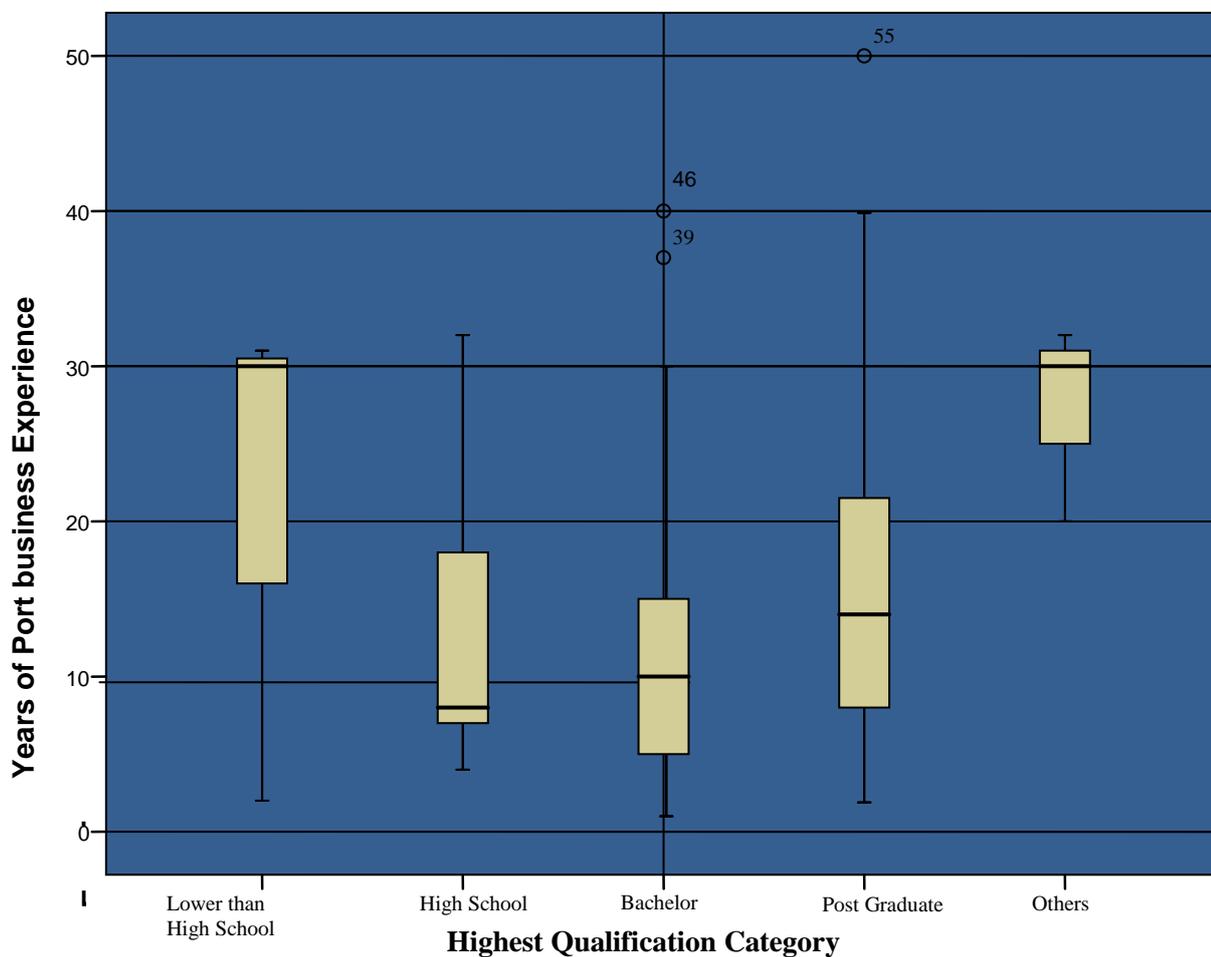
Details of a cross-tabulation of port service areas and port users' qualification levels carried out are found in the table A. The figure A (below) depicted the results of this analysis, showing that many of the port users (49.5% in total) were qualified at bachelor degree level.

In a breakdown of this analysis, except in the area of exporting service where with 2.7% there emerged more post graduate degree holders, port users with bachelor

degrees topped in the areas of stevedoring, freight forwarding, shipping and other services by 10.8%, 10.8%, 13.5% and 9.0% respectively. There were fewer port users with ‘lower than high school’ qualification (2.7%), mainly in the areas of exporting, shipping and ‘others’.

The trend herein indicated that in regards to qualification, there were more port users qualified to bachelor degree level, followed by those who have post graduate degrees, and high school qualification, while is a tie in the proportion of port users with ‘lower than high school’ and ‘others’ qualification

### Summary- Port Users’ Qualifications and Years in Port Business



**Figure A: Boxplot data exploration**

## Mean Analysis for years in port Business

**Table B**

		<b>Highest Qualification Categories</b>				
<b>Years of experience in Port business</b>		Lower than High School	High School	Bachelor Degree	Post-graduate Degree	Others
	<b>Mean</b>	21.00	12.53	11.62	16.39	27.33
	<b>Median</b>	30.00	8.00	10.00	14.00	30.00
	<b>Std. Dev</b>	16.462	8.110	8.790	11.692	6.429

Mean values are models that stand as representatives of a given set of data under investigation. Given the years of experience mean values of 12.53 and 11.62, respectively for port users qualified at high school and bachelor degree levels, as shown in table B, it thus translates that on average terms, port users in these categories have so far spent about 13 and 12 years in port business. Indicating that there was no great difference in terms of years spent in port business between port users qualified at high school or bachelor degree levels.

The small difference in the two groups could suggest that furthering of education pays good dividends in industrial career pursuit and job retention. For example, for those seeking career paths in the port industry/maritime sector, it could be the case that some of those qualified at high school level would search for job for a long time, only to gain entrance into the industry along with their colleagues who opted to further their educations to bachelor degree levels.

Other noteworthy trend is that the years of experience mean values for those in the ‘lower than high school’ and ‘post graduate degree’ were 21.00 and 16.39 respectively.

Essentially, the indication is that these categories of port users have spent more years in the port industry than those in other qualification groups. While in an overall sense, port users qualified at the 'lower than high school level' have the highest years of industrial experience, it would be noted that there exists a gap in career experience in the aspect of attending a higher institution.

Incidentally, all the outliers seen in figure A, (above) occurred within port users' categories qualified to bachelors and post graduate degree levels. Of the outliers, there were port users with up to 40 and 50 years of port industry experience. Statistically, outliers are values or points that lie far from the majority of the observations and have the capacity of exerting strong influence on models (Hutcheson and Sofroniou, 1999).

Another point of interest is that despite the duration spent in formal education, few of the port users who had the outstanding outliers values for years of experience hold qualifications in the categories of bachelor and post graduate degrees. Given trends of outcome, it implies that some of the few port-users who have spent the most number of years in the port business (industry) have got at least a bachelors degree.

While port users with qualifications in the category of 'others' have the highest mean value of 27.33, it is expedient to point out that one of the main reasons for including 'others' qualification category was to have an indication of the extent port users undertake other or additional qualifications.

## Appendix 8 - Chi-Square Test Crosstabulation Distribution of Data

### VAS ATTRACTION-

Table C- Value-adding services port preference vs. port users' attraction

		Impact of Value-Adding Services on Attracting Port Users			
			More Attractive	Less Attractive	Total
Port Users Prefer Value-Adding Service	Strongly Disagree	Count & % within Economies	1	2	3
	Disagree		1.0%	2.0%	3.0%
	Makes no Difference		1	6	7
	Agree		1.0%	6.0%	7.0%
	Strongly Agree		9	7	16
			9.0%	7.0%	16.0%
			31	2	33
			<b>31.0%</b>	2.0%	<b>33.0%</b>
	41	0	<b>41</b>		
	<b>41.0%</b>	.0%	<b>41.0%</b>		
Total		Count	<b>83</b>	17	100
		% of Total	<b>83.0%</b>	17.0%	100.0%

The distribution of data used in generating the chi-square test for the attraction of port users to a port is shown in table C above. It is seen that 83.0% of the respondents indicated that value-adding services has the potentials to attract more port users, which far outweighs the 17.0% with a contrary view that the services would make a port less attractive to port users. In a similar trend, 74.0% of respondents (i.e. who indicated agree and strongly agree), confirmed the assertion 'port users prefer value-adding service port', as opposed to the 10.0% of respondents who jointly opted for the 'disagree' and 'strongly disagree' options in opposition to the statement.

## VAS RETENTION

Table D is presented to show the distribution of data used for the chi-square crosstabulation test for retention of port users.

			Impact of Value-Adding Services on Port Usage Frequency (Retention)		Total
			More Frequently	Less Frequently	
Port Users Prefer Value-Adding Service	Strongly Disagree	Count & % within Economies	0	2	2
			.0%	2.0%	2.0%
	Disagree		1	4	5
			1.0%	4.1%	5.1%
	Makes no Difference		10	7	17
			10.2%	7.1%	17.3%
	Agree		26	7	33
	26.5%	7.1%	33.7%		
Strongly Agree	40	1	41		
	40.8%	1.0%	41.8%		
Total		Count	77	21	98
		% of Total	78.6%	21.4%	100.0%

Observation showed that 78.6% of the respondents were of the opinion that value-adding services have the impact of retaining port users, which opinion was only opposed by 21.4% of respondents with contrary view. These are related to data on using the ports 'more frequently' or 'less frequently'. On a related consideration, a total of 75.5% respondents jointly indicated the 'agree' and 'strongly agree' opinions in affirmation to the statement 'port users prefer value-adding service port'. In total, barely 7.1% of the respondents opted for the 'disagree' and 'strongly disagree' opinions to the same statement 'port users prefer value-adding service port'. These were clear pointers that port users both prefer and would be retained in a port that offers value-adding services.