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COLLEGE OF ART AND BUILT ENVIRONMENT

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DISTRIBUTION MANAGEMENT OF STATUTORY ELECTRICAL MATERIALS IN GHANA: A STUDY OF THE ECG IN KUMASI

By

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DISTRIBUTION MANAGEMENT OF STATUTORY ELECTRICAL MATERIALS IN GHANA: A STUDY OF THE ECG IN KUMASI

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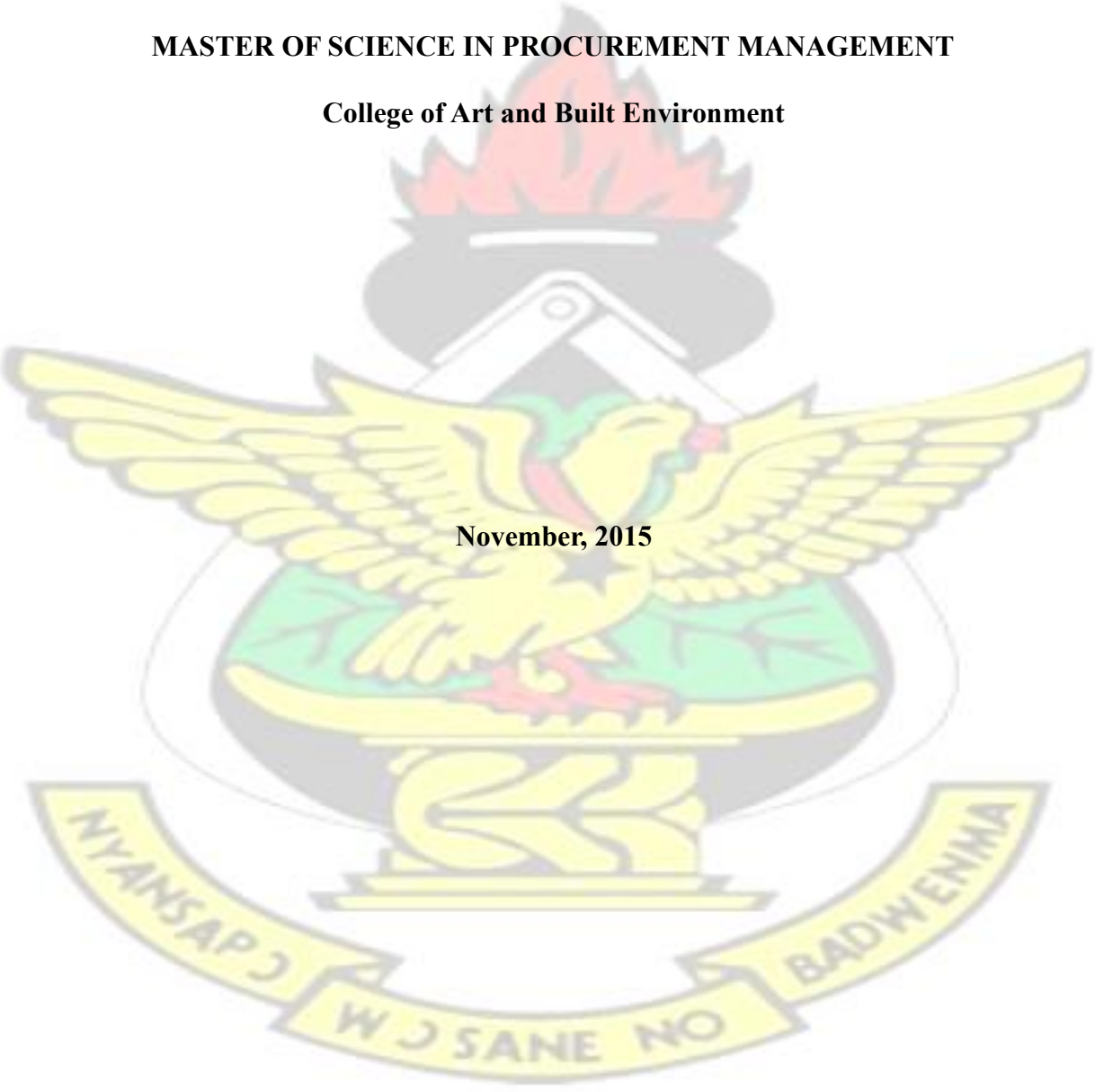

November, 2015

DECLARATION

I hereby declare that this submission is my own work towards the M.Sc Procurement Management degree and that, to the best of my knowledge, it contains no material previously published by another person nor material which has been accepted for the award of any other degree of the University, except where due acknowledgment has been made in the text.

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ABSTRACT

The basic objective of every distribution system in any organization or institution is that right goods and services are delivered to customers at the right time and at the lowest possible overall cost. This leads to not merely satisfaction of customers but delighting them. This empirical study assessed the distribution management of statutory electrical materials in Ghana using the Electricity Company of Ghana in Kumasi as a case. Specifically it assessed how stock and inventories are managed, assessed how statutory electrical materials are distributed to consumers and lastly, identified the challenges faced in the distribution of electrical materials. The design of the study was a crosssectional survey of 50 workers of the Ashanti West Project Office of the ECG in Kumasi who were sampled conveniently. Data for the study was collected through a questionnaire which was administered during the lunch break of workers. The data collected was coded, entered, cleaned and analysed descriptively using the SPSS (v20) software programme. The results of the analysis showed that the Ashanti West Project Office of the ECG in the Kumasi metropolis engaged in effective and efficient stocking and inventory management practices. Statutory electrical materials were well stocked and inventoried. Results of the study in relation to the distribution of electrical materials to consumers also revealed that stores through third party distribution and stores direct to homes/institutions were the channels of distribution adopted by the Office. Statutory electrical materials were mainly transported by road. The nature of the materials, size, as well as the size level required by customers/clients influenced the decision of the staff to resort to this mode of transportation. The most prominent challenge facing the Project Office was the shortage of statutory electrical materials which upon further investigations was due to lack of funds to procure these items. The study on the basis of this finding recommends that the government through the sector ministry for energy make funds available to assist the ECG in the procurement of its statutory electrical materials to meet the ever growing demand of consumers.

DEDICATION

This thesis is dedicated to my wife, Mrs. Juliana Opoku Boansi and my children, for their love and support throughout the programme.

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ABBREVIATIONS

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DMSEMI	Distribution Management of Statutory Electrical Materials Inventory
ECG	Electricity Company of Ghana
SEMs	Statutory Electrical Materials
SPSS	Statistical Package for Social Scientist

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CHAPTER ONE

INTRODUCTION

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1.1 Background to the Study

A very important activity of any industry/institution, be it into manufacturing or service provision, is the need to plan and control the movement and storage of all materials and processed goods. This is relevant not just for the in-plant activities of a company/institution, but also for the associated task of delivery and distribution of its goods and services to its customers, whether they are local or based in overseas (Sharma et al., 2004).

From Rushton et al (2000), the main constituents of distribution have been an imperative feature of industrial as well as economic life for countless years, however it is only in the recent past that distribution management has been known as a major on its own. The nature of distribution itself has been the main reason for this.

Distribution management is a task consisting of many sub-functions. Each of these functions is treated as a separate management process. This study takes a look at distribution management of statutory materials.

Many of the companies now are not capable to compete in separation and therefore be contingent on other companies to accomplish a multifaceted chain of interdependent activities from source-of-supply to the end-user. An active managing so be contingent on how well the joint competences of these industries can be combined to attain a modest market-place advantage.

Distribution management refers to the steps taken to move and store a product from the supplier stage to a customer stage in the logistics and supply chain (Chopra et al., 2007). Distribution occurs at every stage in the supply chain. Raw materials and components are moved from suppliers to manufacturers while finished goods are moved from the manufactures to the consumer.

According to Ballou (2007), the major objective or advantage of distribution management is to minimize the operating costs and to maximize customer service level. This simply means minimizing cost whiles at the same time optimizing customer service and satisfaction. Distribution management therefore plays an important role in the manufacturing and also to a very large extent, utility service organizations' in getting the finished goods and services produced by these organizations into the hands of the ultimate customer or consumer.

The Electricity Company of Ghana (ECG) is a business owned by government organisation founded by Decree with the core goal of increasing public welfare by providing electricity. The services provided by ECG are crucial and it permeates every sector of the economy. To ensure that the power produced by the ECG gets to users, statutory electrical materials such as electric poles, cables, meters, to mention a few are distributed to individuals and institutions. The extent to which the ECG is able to fulfill its mandate of providing power to its populace and generate revenue to continue its operation largely depends on how these products are efficiently managed and distributed.

This study looks at the distribution management of statutory electrical materials at the

Ashanti West Project office of the Electricity Company of Ghana (ECG) in the Kumasi metropolis. The ECG according to a World Bank (2012) report suffers from serious distribution losses including those recorded by lapses in the distribution of electrical materials. The report further maintained that efficient and effective distribution management can help the company earn extra $800 million every year.

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1.2 Problem Statement

The difficult of distribution management which has been in existence and for decades continues to be worldwide than an unusual difficult (Yusuf, 2003). It is not narrow to a sole administration however to all businesses. It is also not restricted to the private division with its contextual cause of profit maximization, however to public division organisations such as the ECG which is involved in service provision. In spite of its varied importance, many business organizations and institutions have not given distribution management the prominence it deserves.

Distribution management of statutory electrical materials at the Electricity Company of Ghana (ECG) is important for varied reasons: for revenue mobilization; effective and efficient service delivery; and for an effective electrification programme. The most important distribution function of any organization is to deliver goods and services to the final consumer in the right quantity, quality, price and at the right place.

Many companies in Ghana within the energy sector in performing this distribution management function do not consider the cost associated with it and the necessary measures to be put in place to make the whole distribution function more efficient, effective and profitable.

The ineffective distribution management of statutory electrical materials by the ECG in recent times has led to decrease in revenue mobilization, ineffective and inefficient service delivery, and increased consumer agitations, all of which have been noted to affect the effectiveness of the electrification programme. This phenomenon has however received less research attention in the Ghanaian context creating a gap in the extant literature on distribution management of statutory goods.

The present study therefore, sought to assess the distribution management strategy of a typical energy distribution company in Ghana, by analyzing the various processes involved in the management and distribution function.

1.3 Aim of the Study

This study primarily assessed the distribution management of statutory electrical materials at the Ashanti West Project Office of the ECG in the Kumasi Metropolis.

1.4 Research Objectives

The objective of this research work were:

1. To assess how statutory electrical materials are stocked and inventoried in the Ashanti West Project Office of the ECG in Kumasi.
2. To assess how statutory electrical materials are distributed to consumers.
3. To identify the challenges associated with the distribution management of statutory electrical materials.

1.5 Research Questions

The study on the basis of the stated problem and objectives answered the following questions:

1. How are statutory electrical materials stocked and inventoried at the Ashanti West Project Office of the ECG in Kumasi?
2. How are statutory electrical materials distributed to consumers in the Kumasi Metropolis?
3. What challenge(s) are faced by the Ashanti West Project Office in the distribution of statutory electrical materials to consumers?

1.6 Significance of the Study

The concern of distribution managing is of dynamic significance to the attainment of any organization/institution in addition is also one of the thoughtful factors of the continuousness as well as sustained productivity of the association.

Using the ECG as a case, the reading will create a stimulating influence to the thoughtful of the overall as well as exact influence of distribution of materials in other public efficacies. Likewise, the reading will advance defend the essential to reinforce warehouse managing with predicted advantage in view.

Again to facilitating the public utility division in winning thoughtful conclusions on distribution managing of stock, it will again attend the awareness of the private division business organisations and the overall public as a source of information as it will add up to the current literature on distribution managing studies.

Again, findings of the study when published will help improve the handling capacities of not only the ECG in Ghana, but also to other public utility service entities the world over.

Lastly, the researcher will benefit by gaining new ideas and methods of effective and efficient distribution of statutory materials.

1.7 Scope and Delimitation

This study explored the distribution management of statutory materials in public utilities with specific position made to the delivery of statutory electrical materials at the Electricity Company of Ghana. The study broadly covered issues related to the distribution of physical goods and services. Specifically, it dealt with how statutory electrical materials such as electric poles, meters, transformers, cables, etc are stocked, inventoried and distributed to serve the populace of Kumasi. It also dealt with an identification of the challenges encountered in the distribution of statutory electrical materials to consumers. The study was delimited to the Ashanti West Project Office of the ECG in Kumasi which is solely responsible for the management and distribution of statutory electrical materials in the metropolis.

1.8 Operational definition of Terms

Distribution Management: in this study distribution management refers to the stocking, inventorying and distribution of statutory electrical materials by the Ashanti West Project Office to consumers in the Kumasi Metropolis.

Statutory Electrical Materials: refers to electrical materials such as electric poles, meters, transformers and cables which the ECG is obliged to supply to its clients.

1.9 Structure of the Research Report

The study report broadly covers five chapters. Chapter one is the introductory chapter and deals with a presentation on the background information leading to the conduct of the study, statement of the problem, aim and research objectives, research questions, importance of the reading, scope and delimitation, operational definition of key terms of the study and the structure of the study report.

The second chapter, which is Chapter two, deals with a thematic review of the extant literature on distribution management. Some pertinent distribution management literature is reviewed in this section. The gaps indentified in the literature reviewed are also presented.

Chapter three looks at the methodological approach to the study. The issues discussed in this chapter includes the research design, population, sample size and sampling technique, data collection procedure and data analysis. The ethical issues considered by the study are also discussed in the chapter.

Chapter four is dedicated to presenting the results of the data collected and analysed. Descriptive data analysis techniques such as measures of frequency and percentages were mostly used. The data analysed was presented in tables.

The final chapter, which is chapter five, includes among others a presentation on the summary of findings, conclusions and recommendations for both practice and future research studies.

Summary

This introductory chapter sets the focus of the study on assessing the distribution management of statutory electrical materials in Ghana, using the Ashanti West Project Office of the ECG in Kumasi as a case. The chapter discussed the background information which revealed some of the importance and significant role distribution management plays in the sustenance of orgainsations and institutions, be it profit making or non-profit making. This was followed by a statement of the research problem; presentation on the main aim of the study, research objectives, and research questions. The chapter also presented the significance and scope of the study.

Last but not least was the presentation on the operational definitions of the key terms used in the study and also organisation of the study report. In sum, this exploratory study represented the first empirical investigation to assess the distribution management of statutory electrical materials in the Ghanaian context.

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CHAPTER TWO

REVIEW OF LITERATURE

2.1 Introduction

This chapter seeks to document information on the various studies conducted by researchers in relation to the present study. The chapter deals with a thematic review of the key concepts associated with the study. The themes reviewed include, distribution management, stock control function, distribution channels and customer service. The review ends with a summary which deals with a presentation on the gaps identified in the extant literature.

2.2 Distribution Management

Distribution management as a concept has been variously defined. For example, Sharma (2006) defines distribution management as that part of management concerned with the design, administrations and operation of systems to control the movement and storage of raw materials and processed goods.

According to Carter and Price (1993) distribution management is the distribution system involved in the packaging and movement of finished goods to the customer or final user. It supports the marketing objective of customer service.

The United States National Council of Physical Distribution Management (NCPDM) (2004) also defines distribution management as the efficient drive of complete product from the production line to the consumer, as well as in some cases comprises the undertaking of raw materials from the source of supply to the commencement of the production line. These undertakings comprise merchandise transport, warehousing, inventory control, plant and warehouse selection, order processing, marketing forecasting and customer service.

According to Waters (2003), distribution managing is the overall term for the undertakings that distribute completed goods to the customers comprising outward transport. It is often associated with marketing and forms an important link with downstream undertakings.

In the view of Palmer (2000) distribution management implies the processes involved in the movement of finished goods outward from the end of the manufacturer's assembly line to the customer, frequently via intermediaries.

Drawing from the various definitions above, distribution management can be explained as all the activities associated with the movement of goods and service to the end user or customer.

The distribution management system involves two key processes, stock control function or inventory and distribution. These processes are reviewed below.

2.3 Stock Control Function

Stock control is well-defined as the way by which resources of the precise amount as well as excellence are made obtainable as and when needed, with regards to low-cost in storing in addition to gathering costs, acquisition prices as well as working capitals (Yusuf, 2003).

Store control is imperative well-designed division of an organisation besides it desires additional responsiveness than it is essentially being currently assumed. It has been regarded in some accommodations as a pointless doing that really costs money although in some other stations it is observed as being important as well as refined process of control modified to defend the records (Yusuf, 2003).

Entirely all administrations have some standard, which must be concerned for, since they denote money and especially in the Electricity company of Ghana where until materials such as meters are distributed to clients' generation of revenue cannot be realized stock control remains very vital.

2.3.1 Inventory Control

In the words of Donald and Lamar lee (1971), "No matter how meticulously a store guardian accomplishes the safekeeping job, some inconsistencies among the definite as well as the steadiness of records is certain to happen." They further report that the system is functioned by people, as well as people intermittently make errors. For this cause, all inventory item should be actually calculated then check in contradiction of its book balance at least once a year.

By definition, inventory is the total stock held in companies for some reasons. Inventory management is central to every organization engaged in the manufacturing, warehousing, shipping and selling of products and commodities. The effective execution of this function has a major influence on the overall performance of the organization and further impacts on the effectiveness of virtually all aspect of the organization's daily activities. The scope of inventory management extends well beyond the traditional practices of records keeping, valuation and stock count (Mensah et al., 2011).

Every company tries to control inventory because it is expensive to hold. Various strategies therefore, are developed so that less or very little stock is held. In the distribution system, the ultimate is how goods will get to the final consumer. Therefore various channels are developed so that the manufacturer does not hold onto inventory all the time (Mensah et al., 2011).

Distributors adopt various systems to make sure products are actually moved from their point of manufacture to the point at which they are ended obtainable to the final consumer. In addition, a decision will be taken as to whether the distributor should transfer the goods straight to the consumer or whether intermediaries should be employed. The final consumer can be a retail outlet, shop, a factory, or a customer's house.

2.4 Distribution Channels

According to Allen (1993), channel of distribution is a tool that explains and clarifies the methods by which products are able to reach the final consumer or user. The final

consumers are the persons who are the ultimate consumers, users or beneficiaries of the product or service provided.

To Coyle et al (2003), a distribution channel consists of one or more companies or individuals who participate in the flow of goods, services, information, and finances from the producer to the final user or consumer. This encompasses a variety of intermediary firms, including those that we classify as wholesalers or retailers. Various types of distribution channels have been identified by authorities in this field. The subsection 2.3.1 below enumerates these types of distribution channels.

2.4.1 Types of Distribution Channels

Manufacturer direct to retail store

This distribution channels deals with the manufacturer himself/herself either holding his/hers products in his finished goods stores or warehouse distributing them to depots or retail stores.

Manufacturer to wholesaler and then to retail shop

With this distribution channel, wholesalers act as intermediaries between the manufactures and small retailers.

Manufacturer through third party distribution

With regards to the manufacturer through third party distribution, the company or organization performs all or some aspects of the distribution system like warehousing or transportation on behalf of the manufacturer.

Factory direct to homes

This distribution channel deals with the delivery of special items or products which do not need to be stocked. Here the manufacturer distribute directly to the doorsteps of the consumer.

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Factory to factory

The last distribution channel is the factory to factory distribution channel. This channel covers raw materials, components and parts of certain products.

Carter and Price (1993), go further to state that, it is becoming increasingly common for a manufacturer to use more than one channel for similar products, for example beer sales through public warehouses and supermarkets likewise Michelin tyres are distributed not only to car accessory shops and garages but as a fabricated part of new citron cars. Each channel enables the manufacturer to serve a different market.

2.4.2 Distribution Planning and Strategy

After identifying the various channels through which organizations or individuals distribute their materials, the next step involved in the distribution process is to plan and strategize on how to transport the good or services to be utilized by the final consumer. Every distribution manager strategizes by studying the comparative advantage, uncertainties of the market environment and the increased complexity of business decisions that have provided an incentive to the organization to seek ways in which corporate resources can be better allocated and contingencies provided for. Planning

enables the business to anticipate change rather than to react to it. It also assists in the identification of risk and enables the cost and benefits of alternatives strategies to be more precisely assessed. It should be noted that, without the planning orientation, the organization is simply carried along by the tide of events rather than actually influencing their shape according to Christopher and Carter (1984).

This implies that, what should be studied must focus on what makes the companies better than others. What are the internal strength and weaknesses and what are the external opportunities and threats. These elements will help in the formulating of overall strategy. The strategy should however be based on; the warehouse location and the distribution network (Yusuf, 2003). The warehouse should however, be also located very close to customers and should hold adequate stocks. Distribution network are needed to provide an effective service to customers whiles minimizing cost. Some companies build transshipment depots to act as intermediate points in the distribution operation for the transfer of goods.

In the final analysis, it is distribution network and the depot location strategies, which aim at establishing the most appropriate plan of storage and transport at a given customer service level. The next question that beckons is "What is the role of distribution in Supply Chain?"

2.4.3 Role of Distribution in Supply Chain

According to Chopra and Meindl (2007), distribution occurs between every pair of stages in the supply chain. Raw materials and components are moved from suppliers to

manufacturers, whereas finished products are moved from the manufacturer to the end user/consumer.

Distribution is a key driver of the overall profitability of the firm because it affects both the supply chain cost and customer experience directly. For instance in the U.S. economy, distribution-related costs make up about 10.5 percent and about 20 percent of the cost of manufacturing.

For commodity products, distribution forms an even higher fraction of the product cost. In India, the outbound distribution cost of cement is about 30 percent of the cost of producing and selling cement. The appropriate distribution network can be used to achieve a variety of supply chain objectives ranging from low cost to high responsiveness. As a result, companies in the same industry often select very different distribution network (Mensah et al., 2011).

2.4.4 The Role of Transportation in Distribution

According to Carter and Price (1993), Transportation is the process of transporting goods and materials either within a network of internal locations (i.e. depots) or to the customer.

Murrphy (1986) states: "Industrial society rests on trade that is the movement of materials from where they are found, to a processing point and then the finished product to the market."

Transportation plays a major role of moving goods and services from a point of origin to another point of consumption. It also extends the range of sources of supply of goods to be consumed in an area; making it possible for users to get products at a cheaper price and high quality (Mensah et al., 2011).

2.4.4.1 Modes of Transportation

According to Carter and Price (1993), there are several methods of transport that can be employed to distribute the goods and services of the organization from the producer to the consumer. In many instances the total distribution system, from production to consumption, will embrace more than one method. The main methods are listed below;

Road Transport

In road transportation, large and heavy lorries are used to transport the goods in bulk to the warehouse and smaller delivery vans are used to make the final delivery to the customer using the road network. In many cases the level of stock damages is reduced when using road transport, as the handling situations are minimized.

Rail Transport

Rail transport involves the transportation of goods to and from the main centres of a country using the rail network. It has the ability to handle bulk loads and is quite competitive in terms of cost.

Water Transport

This mode of transport is the conveyance of goods and services as well as people from one place to another by either sea or a lake. It involves the use of ships, docks, ports and infrastructure to accommodate a large volume of trade. Water transport has the advantage of being relatively inexpensive in relation to bulk loads. However, it is a slow form of delivery and goods have to be collected at the docks and delivered to the warehouse by road.

Air Transport

This method involves the use of commercial passenger aircraft carrying extra freight and also aircraft used entirely for the transport of freight, usually via agencies. Air transport is very expensive, but also the quickest method of transport over long distances. It is usually used in cases where the goods involved are small, light and expensive, so that the cost of transport is only a fraction of the total cost of the item itself.

Pipeline

The term pipeline in broader sense means a facility used to transport commodities from point of receipt to the point of delivery. Many commodities are transported through pipelines. Crude oil, petroleum products and gas are perhaps the most common commodities transported by pipelines.

Pipelines form a unique mode of transportation. They can move large quantities of certain types of commodities, mainly fluids over long distances at relatively low cost. The operations are environmentally friendly, dependable and continuous. The pipelines can be laid on a wide variety of terrains without much difficulty. Compared to normal surface mode like railways and road vehicles, transporting goods via pipelines is associated with advantages such as lower cost of transportation, lower transit losses, lower energy intensiveness, improved economies of scale, lower augmentation cost, minimal land costs and decongestion of surface transport systems.

2.4.4.2 The Choice of Transportation Modes

According to Slater (1982), the choice transport mode is a fundamental part of distribution management which should be analyzed and studied carefully because of the impact upon

a company's operational efficiency. Failure to identify the most appropriate transport mode may incur higher cost than necessary and may provide a lower customer service level which is potentially possible.

The decision upon the choice of the transport mode is extremely complex because of the vast volume of choice available together with numerous methods of evaluation of each choice. Every organization involved with physical goods will require transport services.

The nature of transport services operated by each organization varies and is considerably dependent on factors such as; the nature of the product, size of the order, size level required by the customer/consumer, alternative transport method available and method of finance and the operating techniques to be adopted.

2.4.4.3 Significance of the Choice

Transport costs include all the cost directly associated with the movement of product from one location to another. In order to identify the significance of the choice of the transport mode, it is necessary to be able to determine the impact of transport upon the overall supply chain. This could be achieved by an analysis of existing transport cost, realization of the profit average effect (i.e., any reduction in transport costs would lead to an increase in profit), assuming that the price remains constant and also, analysis of the impact of transport upon the other element of the distribution systems.

Generally, transport costs rise in line with inflation because the major components are labour (drivers and maintenance mechanics) and also measures such as increase or decrease in fuel charges do allow transport cost to increase above the rate of inflation.

2.5 Customer Service and Distribution Management

Customer service is concerned with making the product available to the customer. According to Christopher and Carter (1984), there is no value in a product or service until it is in the hands of the customer. But availability in itself is a complex concept, impacted upon by many factors which might include delivery, frequency and reliability, stock levels and order cycle time.

Ultimately, customer service is determined by the interaction at all those factors that affect the process of making products and services available to the buyer.

According to Rushton et al (2006), distribution can have a variety of different impacts on an organization's financial performance. This particularly applies when the whole of a business is considered. For many companies a key measure of success is the return on investment (ROI): the ratio between the net, profit and the capital employed in the business.

2.6 Gaps in the Literature

The literature reviewed in direct relation to the study subject and that which was the only one available upon a thorough search was foreign and focused on the distribution of electric power (see, Yusuf, 2003). Additionally most of the other cited studies mostly focused on the distribution management of finished products (see, Mensah et al., 2011) and looked only at either stock control or transportation. The studies reviewed also failed to document the challenges associated with the distribution management process. In bridging the gap in the literature, this study assessed the distribution management of statutory electrical materials which has received less research attention in the Ghanaian

context. It further looked at all the processes involved in the distribution management system (from stocking to distribution) and also identified the challenges associated with getting statutory electrical materials to final consumers.

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CHAPTER THREE

RESEARCH METHODS

3.1 Introduction

Research methodology plays a pivotal role in the overall research process and as such its importance cannot be overemphasized. The research methodology not only guides the choice of sample, but also aids in the collection of data in achieving the research objectives and finding answers to the research questions. This chapter describes the methodological approach to the study. It includes a description of the research design, population of the study, sample and the sampling technique. Also included is a presentation on the development of research instrument, data collection and analysis procedures as well as ethical issues addressed by the study.

3.2 Research Design

The research design of the study was a cross-sectional explorative study which utilized a non-probability, convenient sample and a structured questionnaire for the collection of quantitative data involving multiple variables which were analysed descriptively.

3.3 Population

The population for the study consisted of all the Ashanti West Project Office workers (both administrative and non-administrative) at the Electricity Company of Ghana (ECG) in the Kumasi Metropolis. The entire population size upon a preliminary visit to the Project office revealed that the total number of staff working in the office was ninety (90).

3.4 Sampling Technique

The purposive sampling technique was used to sample the respondents of the study. The advantage of the purposive sampling according to Bailey (1994) is that, it enables researchers to use their skills and prior knowledge of the subject to select respondents.

In the application of this sampling method, Kumekpor (2002) adviced selecting the units not through random procedures, but by intentionally picking them for the study. This is because they satisfy the selection criteria which are not randomly distributed in the population but are typical of the characteristics of interest to the study.

In this study, respondents were chosen on the basis of their knowledge and experience in the distribution management role in their organization.

3.5 Sample Size

According to Fraenkel and Wallen (2002), there is no clear-cut answer to the question on sample size selection for any research work or study. To these authors, the best answer lies in the sample which is large enough for the researchers to obtain the needed data with affordable time and energy. Fraenkel and Wallen therefore recommended as large enough

as researchers can reasonably obtain. In considering the sample size for the study, three key characteristics were used as the selection criteria. The following attributes were used to select the respondents:

a. A supervisor or manager depending on which is applicable
b. An employee/manager who had served at the Project office for more than two years
c. An employee physically present at the Project Office during the distribution of the questionnaire.

The first two selection criteria are justifiable by the fact that respondents with these two qualifications have at least vast and relevant experience and are conversant with the activities and practices within the distribution management of electrical materials in the Project Office. The third criterion ensured an easy distribution and collection of research instrument (questionnaire) to help attain a high response rate and at the same time saved the researcher and his assistance time. In all fifty (50) respondents were sampled for the study. Out of this number, 12 constituted administrative staff while 38 were non-administrative staff.

3.6 Development of Research Instrument

The study's objectives and research questions basically informed the design of the questionnaire. Before the design of the questionnaire, a thorough literature search was also made to determine and categorise concepts and variables used in other studies which related to the topic of study. Information from the literature reviewed centered on issues related to distribution management of goods and services within private and public entities globally, in Africa, and in Ghana.

3.6.1 Description of Research Instrument

The research instrument crafted for this study was titled: "Distribution Management of Statutory Electrical Material Inventory (DMSEMI)." The DMSEMI is a thirty (30) item self reporting research instrument utilizing close-ended questions and mutually exclusive and exhaustive response categories which facilitated numerical coding of data. The entire instrument was arranged into content sub-sections '**A**, **B**, **C and D**'.

Section 'A' of the DMSEMI consisted of six (6) demographic and background survey items. Question no.1 measured respondent's sex/gender and was coded 1= male and 2= female. Questions no.2 and no.3 measured respondents' age and educational attainment respectively. The study scale used in question 2 was coded (1) 18-30 years, (2) 31-40 years, (3) 41-50 years, (4) 51-60 years, while that of question 3 was coded (1) Primary, (2) Elementary/J.S.S/MSLC, (3) Secondary/Technical, (4) Polytechnic/University. The coded rating scale of 1= Administration, 2= Procurement, 3= Stores, 4= Transport, and 5= Distribution applied to the question no.4 on respondent's department of work.

Question no.5 which addressed Project office staffs present position/level was also coded as follows: 1= Senior level, 2= Intermediate level, 3= Junior level and 4= New recruit. Question 6 explored respondents years or work with the Ashanti West Project Office. The four ranges of years of work were coded as: 1= 1-5 years, 2= 6-11 years, 3= 12-17 years and 4= 18+ years. Question 7 which was the last item on respondents background characteristics measured the type of services provided by respondents in relation to the function performed in the logistics and supply chain function. The coding scheme of 1= procurement and receiving of materials, 2= materials management, 3= distribution of

electrical materials to consumers and 4= all of the above was applied. Thus, Section 'A' of the DMSEMI identified measures that distinguished between Project Office staffs either in terms of demographic variables such as gender, age, educational attainment, department of work, position in the Project Office and length of work with the Office or their role in the logistic and supply function .

Section 'B' consisted of 16 carefully developed items generated through prior research to tap appropriate conceptual domains on stock and inventory control. The items measured included the form of inventories normally handled, sources of inventories, forecasting of inventory, existence of an Inventory Control Unit, origination of inventory control activities, system of inventory operated, inventory costs encountered, tools to maintain effective inventory records and etc (see Appendix 1).

The Section 'C' of the DMSEMI also consisted of five research items developed to measure the channel of distribution adopted by the Project Office, the strategy adopted in the distribution management, mode of transporting electrical materials, factors influencing the decision to adopt this mode and the percentage of transportation cost added to the electrical materials distributed. Respondents assessed these items by choosing the answer which suited them best.

Two (2) questionnaire items in the Section D of the DMSEMI also identified the challenges faced by the Project Office in the distribution of statutory electrical materials to consumers.

Additionally, questions had standard instructions that requested respondents to select the most suitable answer with the assurance that there was no right or wrong answer in the selection of answers to the items.

Measurement of Content and Construct Validity

The content and construct validity of a measurement scale depends largely on the extent to which an empirical measurement reflects a specific domain of content (Pallant, 2011). To address content validity in this study, a thorough review of the extant literature was made and themes which were directly related to the study were considered. Construct validity of the research instrument developed was also ascertained through the pre-test exercise.

3.6.2 Pre-test of Research Instrument

It was of importance that the researcher pre-test the instrument crafted to ascertain its validity and reliability measures before using it for the actual collection of data for the study. The pre-test conducted helped to identify research items that sounded ambiguous and irrelevant and also gauge the time respondents spent on completing the survey instrument (questionnaire). The pre-test was carried out among staffs of the Ghana Water Company limited which also deals with the distribution of statutory materials such as water meters, etc. Ten (10) respondents were recruited for the pre-test exercise.

3.7 Data Collection

Data for the study was collected over a two week period in the month of September after pre-test of the research instrument had been conducted. Quantitative data was primarily sought for the study. Data was obtained through the use of a structured questionnaire appropriately and specifically designed for the study. The response categories of the various questions (variables) were mostly pre-coded. One (1) researcher assistants was

recruited and trained by the researcher to assist in the data collection. The data collected was managed by the research assistant under the supervision of the researcher.

3.8 Data Management

Research generates information that must be coded, analyzed and interpreted. In order to make meaning out of the data collected, the following data management processes were engaged in:

Data Coding

This process aimed at simplifying the data entry and analysis process. In the exercise of translating words into numbers a scheme called coding instruction was prepared to direct the process. The first step in this process was to provide a coding frame, or the coding scheme. The scheme was then used to translate the responses in the questionnaire into numbers. Coding for this study was straight forward since the close ended type of questions with mutually exhaustive responses was utilized.

Data Entry

Data once coded was entered into the Statistical Package for the Social Sciences (SPSS) Software (Version 20) by the research assistant. Variables were defined in the variable view phase of the SPSS programme while data was subsequently entered into the data view of the software programme to create a data file.

Data Cleaning

It was of importance that the researcher checked thoroughly for errors or mistakes after data had been inputted into the SPSS programme. Data cleaning at this stage involved eliminating errors in coding. Since data processing errors are inevitable, the researcher paid particular attention to the entry of data and used all possible means for checking mistakes. The validation tool in the SPSS programme which gives information about missing values with their identification numbers and wrong entries made was also utilized to further confirm that the data was clean and error-free. There were no missing values in the data.

3.9 Data Analysis

Data once cleaned was again analysed using the Statistical Package for Social Scientist (SPSS v20) software programme. The analytic strategy used in the study was primarily informed by what best fits the data, instead of a technique chosen beforehand. Based on appropriateness and the explorative nature of the study, descriptive statistics such as frequencies and percentages were mostly utilised.

3.10 Ethical Issues

Before the commencement of the study, permission was first sought from the Head of the Ashanti West Project Office of the ECG in the Kumasi Metropolis.

Individual informed consent was also obtained from all participants before administering the survey instrument. This was done after the nature, purpose and scope of the study had been explained to study participants.

In order to ensure anonymity of the study participants, they were instructed not to provide any form of personal identification. They were however made to indicate the date of completing the survey questionnaire.

To ensure that the information provided by study participants is kept confidential, the researcher and academic supervisor only had access to the data.

3.11 Limitations of the Study

As with all physical and social science research, this study has limitations and it is important to highlight its major limitations.

A primary limitation of this study concerns the use of a self-report questionnaire, which was administered to staffs of the Ashanti West Project Office of the ECG to collect primary data for the study. Given the potential anxiety related to disclosing issues specifically relating to assessing an individual's organization or group of belonging, it is anticipated that the study participants might have felt pressured to respond in ways they considered socially desirable, though the researcher assured them of anonymity and confidentiality. The implication is that the accuracy of the participants' responses may have been to some extent more subjective than objective. This notwithstanding it must be emphasized that the adoption of observation as an additional form of data collection and verification strategy makes the findings of this research valid.

An additional limitation of this study is its inability to generalize findings to the entire population of public entities (public utility companies) in Ghana which also deal with the distribution management of statutory materials such was the Ghana Water Company

Limited. Geographically, the survey area of the study was located within the Ashanti Region and may only reflect distribution management processes peculiar to the case institution, though the results may coincide or be similar to other ECG Project Offices in other parts of Ghana.

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Summary

This chapter provided a detailed description of how quantitative data for the study was collected, managed and analyzed. Overall, the field survey exercise proved to be an exciting one and provided the researcher with the practical experience of conducting a social survey. The next chapter presents the results of data analysed.

CHAPTER FOUR

DATA ANALYSIS AND DISCUSSION

4.1 Introduction

This chapter presents results of the primary data collected and analysed from the field survey. The chapter is divided into sections which correspond with the study's objectives. The first section deals with a presentation of results on respondents background characteristics. The second section deals with a presentation of results on stocking and inventorying of statutory electrical materials. The third section further presents results of the study in relation to the distribution of statutory electrical materials to consumers/clients. The final section, which is section four deals with a presentation of

study results on the challenges faced by the Ashanti West Project Office in the distribution management of statutory electrical materials.

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4.2 Background characteristics of Respondents

This section presents data results on the distribution of respondents in terms of their background characteristics. The background variables measured included, sex, age, level of educational attainment, department of work, current position/level, length of work with the Project office and the type of service provided in the logistics function. The distribution of respondents on these background variables is presented in Table 4.1.

According to the Table 4.1, a higher percentage of respondents sampled for the study were males (90%) compared to females (10%). The high percentage of males recorded for the study reflects the dominance of the male population working in male dominated fields in Ghana. As an add up to this result, the researcher during the questionnaire administration further observed that most of the females working in the Ashanti West Project office were involved in administrative and clerical duties. The distribution of the study respondents with respect to their age also revealed that respondents between the ages of 18 – 30 years constituted the highest percentage of the sample (70%). This also indicates the dominance of young adults in the labour force in Ghana.

Table 4.1: Background characteristics of Respondents (N=50)

Variables	Categories	n	%
Sex	Male	45	90.0
	Female	5	10.0
Age group (years)	18 - 30	35	70.0
	31 - 40	13	26.0

	41- 50	2	4.0
Education attained	Elementary/JSS/MSLC	8	16.0
	Secondary/Technical	28	56.0
	Polytechnic/University	14	28.0
Department of work	Administration	4	4.0
	Procurement	6	12.0
	Stores	2	4.0
	Transport	7	14.0
	Distribution	28	56
	Customer care	3	6.0
Current position	Senior level	14	28.0
	Intermediate level	28	56.0
	Junior level	7	14.0
	Supporting staff	1	2.0
Length of work (years)	1 – 4	28	56.0
	5 - 10	21	42.0
	11 - 18	1	2.0
Service provided in the logistic function	Procurement and receiving of materials	12	24.0
	Distribution of elec. Materials to consumers	35	70.0
	None	3	6.0

Source: Author's Field Survey, September, 2014

The distribution of respondents with respect to their educational attainment also revealed that majority of the respondents (28, 56%) had attained Secondary/Technical levels of education. A contingency analysis further revealed that the respondents who had attained Elementary/JSS/MSLC level of education were mostly engaged in transporting of the statutory electrical materials. The respondents who had attainted Polytechnic/University level of education were involved in administrative, procurement, stores and customer care duties. Overall it is evident that all the respondents who participated in the study had attained some level of formal education.

Considering the department of work of respondents, a higher percentage (56%) reported that they worked in the distribution department. The high number recorded for respondents working in the distribution department corresponds with the core business of the Project office, which is to distribute electrical materials to customers.

According to the Table 4.1, fifty-six percent (56.0%) of the respondents who completed the survey questionnaire had attained intermediary level of position on the organizational hierarchy. This was followed by respondents who had attained senior level position in the office.

On the number of years of work with the Ashanti West Project office, a high percentage of the respondents (56.0%) indicated that they had had between 1 to 4 years working time with the Project office. Respondents who had worked between 11 – 18 years constituted the minority (2%).

Investigation into the type of function provided by the respondents in the logistic function lastly revealed that most of the respondents were involved in the distribution of electrical materials (70%). This implies that the main purpose of the Project office is to manage and distribute statutory electrical materials.

4.3 Stocking and Inventorying of SEMs

This section of the chapter deals with a presentation of the results on the stocking and inventorying of statutory electrical materials at the Ashanti West Project Office. Stocking and inventorying which is the first in the distribution management process helps to ensure that the materials received are well documented, either electronically through the use of computer or manually through the use of record keeping books or Tally cards. Results of

this section are subdivided into two sections. The first subsection which is 4.3.1 presents the results on the inventorying process, while the second section which is 4.3.2 deals with a presentation of results on stocking.

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4.3.1 Inventorying of SEMs

The Table 4.2 on the inventorying of statutory electrical materials by the Ashanti West Project Office reveals that the inventories normally handled entailed maintenance, repairs, operating supplies and production inventories. All the 50 respondents, representing 100 percent (%) were of this opinion. In relation to this result, it can also been from the Table 4.2 that the sources of inventories were mostly from a local source and also from the control depot. This was indicated by 64% and 36% of the study participants respectively.

From the Table 4.2 it is clear that the Project office embarked on inventory forecasting. All the 50 respondents, constituting 100% of responses alluded to this fact. Forecasting was done on both short and long term basis as indicted by 20% and 80% of the staffs of the Project office.

Table 4.2: Inventory Control of SEMs (N=50)

Variables	Categories	n (%)
Inventories handled	Production inventories	10 (20.0)
	Maintenance, repairs and operating supplies	40 (80.0)
Sources of inventories	Direct imports	-
	Local source	32 (64.0)
	Control depot	18 (36.0)
Forecasting	Yes	50 (100.0)
	No	-
Type of forecasting	Short term	5 (10.0)

	Long term	45 (90.0)
Inventory Control Unit Available	Yes	50 (100.0)
	No	-
Origination of inventory actions	Accounts department	15 (30.0)
	Central warehouse	35 (70.0)
System of inventory control operated	Fixed Order System	50 (100.0)
	Cyclical Ordering System	-
Cost of carrying inventory encountered	Storage costs	10 (20.0)
	Breakages/damages and obsolescence	40 (80.0)
	Insurance and Taxes	-
Ordering costs encountered	Transportation	40 (80.0)
	Import duties	-
	Administrative costs	10 (20.0)
Tools used to maintain inventory records	Inventory records	5 (10.0)
	Inventory models	-
	Computer	45 (90.0)

Source: Author's Field Survey, September, 2014

Response on the existence of an inventory control unit also revealed that all (50, 100%) the respondents who participated in the study indicated that the Project office had an Inventory Control Unit.

Table 4.2 also shows that inventory control actions originated from the accounts department and the central warehouse. Details wise, a high percentage of the respondents (70.0%) indicated that the inventory control action or activity emanated from the central warehouse. According to the Table 4.2, all the respondents representing 100 percent reported that the Project office engaged in fixed order system of inventory control.

The costs of carrying inventory that the Ashanti West Project office encountered comprised of mostly Breakage's/damages and obsolescence cost (as indicated by 80% of respondents) and storage costs (as indicated by 20% of the respondents). The ordering

costs encountered also mostly consisted of transportation (indicated by 80% of the staffs) and administrative costs (indicated by 20% of the staffs).

From the information in Table 4.2 it can be seen that majority of the respondents sampled for the study indicated that the Project office utilized computers and inventory records in the effective maintenance of inventory records. This was indicated by 10% and 90% of the respondents respectively.

Overall, it can be inferred from these results that the Ashanti West Project Office took a keen interest in ensuring that the electrical materials in their care were effectively inventoried.

4.3.2 Stocking of SEMs

According to Yusuf (2003) since the stock detained by an association signifies money, its control has thoughtful monetary insinuations for the institution.

From the Table 4.3 it can be seen that the Ashanti West Project office recognizing the importance of stocking employed together the incessant as well as intermittent form of stock recording. Out of the 50 respondents who participated in the survey exercise, all (100%) indicated that the project office engaged in a decentralized system of store keeping.

From Table 4.3 it is again unblemished that the matter of determining on excellence, amount as well as price of the stock is common mostly by the Purchasing officer and Chief store officer of the office and not anyone else of the office. This implies that since the

Project office considers stocking as playing a key role in its operations it has to assign this function to the people with the expertise.

Information from the Table 4.3 also reveals that the Ashanti West Project Office of the ECG in the Kumasi Metropolis engaged in bulk purchase as indicated by all the respondents sampled. Taking of stock was conducted in teams and in some instances by the store-keeper.

The Table 4.3 lastly shows that the concern for operative store Control, store-holding plus valuation of goods fell in the domain of the Higher stores officer and Stores officer of the Project office.

Table 4.3: Stocking of SEMs (N=50)

Variables	Categories	n (%)
Stock taking engaged in	Perpetual/continuous	5 (10.0)
	Periodic	45 (90.0)
Nature of stores keeping practiced	Centralized	-
	Decentralized	50 (100.0)
Person responsible for stocked purchased	Purchasing officer	40 (80.0)
	Chief store officer	10 (20.0)
Purchasing policy adopted	Bulk purchase	50 (100.0)
	Piece purchase	-
Nature of stock taking	Team-work stock taking	35 (70.0)
	Stock-taking by store-keeper	15 (30.0)
Person responsible for stores control, stock holdings and assessment	Higher stores officer	30 (60.0)
	Store keeper	10 (20.0)

	Store officer	10 (20.0)

Source: Author's Field Survey, September, 2014

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4.4 Distribution of SEM

Production it is often said to be completed when the finished good gets to the final consumer. Every company be it profit making or non-profit making, ensures that frantic efforts are made to minimize not only the cost of production but also cost involved in distribution by choosing the most effective and relatively less expensive mode of distribution.

The Ashanti West Project Office may not be directly involved in distribution of finished goods but the service it provides or renders ensues that the electric energy produced by the mother company ECG and distributing organizations such as the Ghana Grid Company (GRIDCO) gets to consumers and is utilized.

The utilization of the electric power produced implies individual homes and institutions request for statutory electrical materials. The onus of providing electrical materials to consumers solely rest on the hands of the Project office; an activity which can be said to be a daunting one. In order to assess how statutory electrical materials are distributed to serve the needs of clients, workers of the Project office were among other questions asked to indicate the channel of distribution used, strategy adopted in the distribution management, reasons for adopting that strategy, mode of transporting electrical materials, factors influencing the choice of transportation mode and lastly the percentage of transport cost added to electrical materials supplied.

The responses of respondents on these measures of SEMs distribution as depicted in the Table 4.4 shows that two channels of distribution, which are stores through third party distribution and stores direct to homes and institutions were the channels of distribution adopted by the Ashanti West Project Office.

On the mode of transporting electrical materials, it can be seen from the Table 4.4 that all the Project office staff indicated that the office transported its electrical materials by road. Transporting goods, be it manufactured or service goods by road is the most common adopted mode of distributing (Mensah et al., 2011). The Project office supplies electrical materials in-country, that is, to homes and institutions within the Kumasi Metropolis and within the shores of Ghana. This therefore does not require other means of transportation which though may be necessary, not considered as expedient. In deed materials such as electrical polls can only be transported by road.

Table 4.4: Distribution of statutory electrical materials to consumers (N=50)

Variables	Categories	n (%)
Channel of distribution utilized	Stores through third party distribution	10 (20.0)
	Stores direct to homes/institutions	40 (80.0)
Mode of Transportation	Sea	-
	Road	50 (100.0)
	Air	-
Factors influencing mode of transport choice	Nature of the product Size	30 (60.0)
	of the order	8 (16.0)
	Size level required by customers	12 (24.0)
Percentage (%) of transport cost added to electrical materials	Between 1% and 2%	40 (80.0)
	Between 3% and 4%	10 (20.0)
	Between 5% and 6%	-

Source: Author's Field Survey, September, 2014

The factors indicated by respondents as influencing their decision to resort to this mode as seen in the Table 4.4 above included; the nature of the materials, the size level required by customers and the size of the order. From this result it can be inferred that in choosing a medium or mode of transportation, the Project office does not only consider the cost of transportation but also takes into consideration the nature and size of the materials requested. By choosing this mode, the Office is able to get electrical materials to consumers at a relatively less price. It must however be stated that while settling for road transport may be considered as expedient, transporting electrical materials on unmotorable roads, which is mostly a characteristic of many Ghanaian roads posses a great challenge as this sometimes results in the breakdown of the vehicles used in transporting electrical materials.

Money or funds which could have been used to procure electrical materials may be channeled to the servicing and repair of vehicles. These challenges notwithstanding, compared to the other alternatives available, that is sea and air, transporting electrical materials by road is the most preferred choice.

On the percentage of cost added to the electrical materials transported, majority of the respondents reported between 1% and 4% of the transportation cost added to the prices of the electrical materials.

In sum, it can be concluded that while adopting the most effective and efficient mode of transportation, the Ashanti West Project Office does not only bear the cost but allocates a minimal percentage for consumers/clients to also bear.

4.5 Challenges faced in the Distribution Management of SEM

The Ashanti West Project office of the ECG like any other entity faces a myriad of challenges in carrying out their mandate. In deed the continues agitations and outcry of the public in terms of the stress involved in securing electrical materials especially meters, electrical poles and cables which they pay huge sums of money for, tells of the fact that lapses exist in the distribution system of statutory electrical materials.

To identify the challenges faced by the Ashanti West Project Office in the distribution of electrical materials to consumers, respondents were first asked to indicate if the project office had all the statutory electrical materials available. The responses as indicated by the respondents revealed that not all the electrical materials needed were available, as indicated by almost all the respondents (95%). The respondents who indicated that not all the needed materials needed were available further cited shortages and lack of funds to procure these materials as the two key reasons for the unavailability. From this result it can be inferred that the lack of funds which translates to the inability to procure the right quantity of electrical materials creates shortage which results in the inability of the Office to effectively and efficiently carry out its activities.

Summary

Over all, the consistent patterns in the analyses of the results of the study tend to reflect the findings (Yusuf, 2003; Mensah et al., 2011, Chopra & Meindl, 2007) of distribution management from the extant literature. The next chapter will elaborate on the significance

of the research findings in relation to the study's objectives and address the study's implication for practice and direction for future research.

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CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter of the study focuses on presenting a review of the research objectives and conclusions drawn from results of the data collected for the study. Further discussions which relate statistical findings to previous empirical research are also made. The chapter

ends with a discussion on the study's implication for future research and recommendations.

5.2 Review of Research Objectives

The overall aim of this research was to assess the distribution management of statutory electrical materials at the Ashanti West Project office of the ECG in the Kumasi Metropolis.

There is to some extent a plethora of research that have assessed the distribution of products to consumers and clients (see, Sharma, 2006, Yusuf, 2003, Mensah et al., 2011), however little or no cross-sectional or longitudinal studies have been conducted to assess the distribution management of statutory electrical materials both in the Ghanaian and foreign context. Considering the role electric power plays in the sustenance and thriving of the Ghanaian economy the importance of this research cannot be overemphasized. Assessing how statutory electrical materials, without which the power generated by the Electricity Company of Ghana cannot be utilized by individuals and institutions, was therefore the basis of this study to assess how these electrical materials are efficiently managed and distributed in the wake of clients and customers agitations on the delays and unavailability of statutory electrical materials to serve their needs.

Evidently, distribution management which is a multifaceted process remains a key ingredient in the supply chain management. It serves as a brokery which links the goods and services produced to the final consumer or client for their utilization and also the generation of revenue for the company or institution of produce.

Apparently, the effective and efficient distribution management of materials be it finished or unfinished operates to ensure the sustenance and functioning of utility service companies such as the Electricity Company of Ghana. Appreciating the operation of the various interdependent processes (which are stocking and inventorying and distribution) in one study was considered both useful and a methodological strength which allows for a holistic approach to the study of distribution management. The present study assessed the distribution management of statutory electrical materials by the Ashanti West Project Office of the ECG in Kumasi. Three fundamental processes involved in distribution management were examined in this study to ascertain how statutory electrical materials at each point of these three processes are handled or managed. The unique contributions of these various processes to the overall maintenance of the distribution management system was the primary reason of the study to assess how electrical materials are managed at these three stages of distribution management. These stages or processes were selected based on the review of the extant literature on distribution management as a whole and were singled out to determine the meaningfulness to the logistics and supply chain.

There was sufficient evidence in the literature to conclude that the distribution management of statutory materials such as electrical materials has received relatively little empirical investigation. Most often, the discussion of issues pertaining to electricity generation and management is centered on the generation of power itself to the neglect of distribution of statutory electrical materials which also plays a key role to the existence of the ECG. Large sums of revenue which could be accrued by the ECG are lost as a result of the non-availability of electrical materials to serve clients. Obsolete and faulty meters take a relatively longer period of time to be replaced and in some instances some staff divert some of these electrical materials to sell to consumers, all of which posses as a

setback to the carrying of the mandate of the ECG. The summary of the study findings is presented in two sections. The first section of the summary pertains to the general conduct of the research while the second deals with a presentation of summary of the study results based on the research questions of the study.

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5.3 Summary of the Research

The main goal of this reading was to assess the management and distribution of statutory electric materials in a public utility company in Ghana, the Electricity Company of Ghana to be precise. The study focused on the Ashanti West Project Office of the ECG in Kumasi which solely deals with management and distribution of statutory electrical materials. Using the convenient sampling technique 50 employees/staffs of the Ashanti West Project Office were sampled and administered with a questionnaire which was designed based on the objectives of the study. An overall of thirty research questions were employed in design of the questionnaire for the study, while a total of 50 questionnaires were directed. Of this number, all were retrieved, demonstrating 100% of the response rate. Data resulting from the survey workout were moreover evaluated founded on frequency distribution of respondents' views. As an extra to questionnaires, non-participant observation was employed to draw some extra info not enclosed in the questionnaires. Associated literature was studied broadly, shell such areas as, stock and inventory control function, distribution management and the relationship between customer service and distribution management. The gaps in the literature were also identified.

From the analysis of the background characteristics of respondents, it was revealed that male workers of the Project office out-numbered female workers. It was also revealed that the workers were mostly in the prime years of their life, with majority belonging to the 18 – 30 years and 31 – 40 years age cohort. It was again revealed that all the respondents had attained some level of formal education and also performed a distinct but interrelated and interdependent role in the logistic function, all of which led to the effective and efficient distribution of electrical materials.

5.4 Summary of findings in relation to Research Questions

5.4.1 Research Question 1

The first research question this study attempted to address was: "How are statutory electrical materials stocked and inventoried at the Ashanti West Project Office of the ECG in Kumasi?"

To answer this question, the study had as one of its specific objectives to assess how statutory electrical materials are stocked and inventoried. Fifteen research items were developed to ascertain how electrical materials are stocked and inventoried. The items measured among other things bothered on the form of inventories normally handled, sources of inventories, embarking of forecasting of inventory, availability of an Inventory Control Unit, origination of inventory control actions and activities, system of inventory operated, inventory costs encountered, tools to maintain effective inventory records and etc (for full list see Appendix 1). Upon the analysis of the data collected on these questionnaire items it was revealed that on the whole, the Ashanti West Project Office of the ECG in the Kumasi metropolis engaged in effective and efficient stock taking and

inventory management practices. Details wise, it was revealed that the Office usually handled maintenance, repairs and operating supplies. The sources of inventories were mostly from local sources and the Control Depot. The Office also engaged in both short and long term forecasting, an activity which is carried out by the Inventory Control Unit. The inventory control actions originated from the central warehouse and accounts departments, with the Higher stores officer, the stores officer and the store keeper being responsible for the stores control, stock holdings and assessments of materials received. Computers as well as books were utilized in the stocking and inventory control function.

5.4.2 Research Question 2

The second research question this study attempted to answer was: "How are statutory electrical materials distributed to consumers in the Kumasi Metropolis?"

To answer this question, the study also had as its second specific objective to assess how statutory electrical materials are distributed to potential and already existing users of electric power. Five research items which related to the channel of distribution adopted by the Office, the strategy adopted in the distribution management, mode of transporting electrical materials, factors influencing the decision to adopt this mode and lastly the percentage of transport cost added to the electrical materials distributed. After analyzing the data it was also realized that the channel of distribution adopted was the stores through third party distribution and stores direct to homes/institutions. The warehouse location and distribution network were the strategies adopted by the Project office in the distribution management process. Statutory electrical materials were transported by road. The nature of the materials, size as well as the size level required by customers/clients influenced the

decision of the staff to resort to this mode of transportation. On the percentage of transport cost added to the electrical materials distributed, it was a minimal percentage of between 1-3% was added.

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5.4.3 Research Question 3

The third and last research question this study attempted to find an answer to was: "What challenges are faced by the Ashanti West Project Office in the distribution of statutory electrical materials to consumers?"

In addition to the specific objectives one and two, a third research objective was also developed to answer this question. The respondents of the study in this vein, where asked to enumerate some of the challenges they encountered with regards to the supply of electrical materials to consumers. Upon the analysis it also came to light that the predominate challenge facing the Project office was the shortages of statutory electrical materials which upon further interrogation was as a result of lack of funds to procure these items.

In sum, considering the fact that limited studies have been conducted in this area, this study sets the basis upon which further studies could be conducted. It thus becomes the first to fill in the gap of the extant literature on distribution management of statutory electrical materials in both the Ghanaian and foreign context.

5.5 Summary of Conclusion

For the logistics and the supply chain to be able to impact positively on any organization, goods produced and services rendered should be effectively and efficiently managed and distributed. Efficiency in distribution not only will ensure that customers are delighted but also very satisfied.

Broadly, this study was dedicated to assessing the distribution management of statutory electrical materials using the Ashanti West Project Office of the ECG in Kumasi as a case study.

More specifically, the study assessed how statutory electrical materials are stocked and inventoried; assessed how statutory electrical material are distributed to consumers and indentified the challenges associated with the distribution management of statutory electrical materials. The results of the study revealed that overall, statutory electrical materials handled by the Project Office were effectively stocked and inventoried.

Response on the distribution of electrical materials to clients also showed the Ashanti West Project Office of the ECG has been careful and selective in choosing the most appropriate and cost effective channel of distribution, which is transporting electrical materials by road. In the line of performing its duty, the Project office is however primarily challenged by the shortage of electrical materials which mostly is as a result of lack of funds. Efforts to curtail this challenge should therefore be considered and dealt with by the administrative machinery of the 'mother' company ECG so as to fulfill the company's mandate of providing affordable electric power for the use of individuals and industries in Ghana.

5.6 Implications for Future Research

As with all works of original research, replication of this study would serve as a check on the reliability and generalizability of the present findings. Beyond mere replication, however, the findings from this study suggest several promising directions for future research.

To start with, researchers may wish to extend this study by extending the scope of the study to include the assessment of distribution management of the electric power produced by the Electricity Company of Ghana. To date no empirical study has been conducted in this grey area of research.

In addition, unlike the cross-sectional design employed in this study, a longitudinal design would permit inferences regarding establishing effective and efficient measures to be adopted to meet the challenges faced in the distribution management of statutory electrical materials by the various Project Offices of the ECG. Insight regarding the primacy of this phenomenon would be valuable both from a theoretical standpoint and mitigation of challenges.

Lastly, going beyond the numbers which is manifested through the quantitative approach adopted by the present study, a mixed method involving both quantitative and qualitative methods could be considered. The qualitative data will additionally provide an in depth understanding into the phenomenon under study.

5.7 Recommendation for Practice

Considering the fact that the unavailability of funds to procure the needed statutory electrical materials to supply old and new users which transcends into shortages, was identified as the major challenge facing the Project office, the study recommends that the government through the sector ministry for energy make funds available to procure these electrical materials to supply the needs of consumers.

Additionally instead of the ECG solely depending on the Government to raise funds for the purchase of these electrical materials, it is again recommended that the ECG effectively mobilizes its resources by collecting the electricity tariffs owed them by individuals and institutions. This will enable the company to internally generate funds to purchase these electrical items.

Lastly, the results of the study revealed that the stocking and inventorying of available electrical materials was efficiently carried out by the staff of the Project Office with both short and long-term forecasting done, the researcher commends the staff for this effort and further recommends that the staff continue to work to improve the distribution management of electrical materials by ensuring that the materials actually get to the users and not end up in the staffs individual homes. The incidence of users having to pay huge sums of money to "connection men" who at times happen to be staff of the Project office is a dent on the image of the Office and the efforts of the hardworking staffs who do not resort to such nefarious activities.

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APPENDIX 1

QUESTIONNAIRE FOR PROJECT OFFICE STAFF

To the Respondent

This questionnaire is designed to help the researcher conduct a survey as part of the requirement for an MSc. Degree in Procurement Management. The topic for this survey is "Physical distribution management of electrical materials in Ghana: A study of the ECG in Kumasi." Your assistance is being sought to participate in this exercise by completing this questionnaire as candidly as possible.

Please be assured that information provided in this questionnaire is purely for academic purpose and therefore would be treated with utmost CONFIDENTIALITY. This questionnaire will remain an anonymous document for analysis and will be discarded thereafter. Thank you for participating.

INSTRUCTIONS

Please read each question and Tick [√] the statement or choose the number that clearly reflects your view, you can also express your views where necessary. There is no right or wrong answer.

SECTION A: BACKGROUND CHARACTERISTICS

1. Sex/ Gender: a. Male ☐ b. Female ☐

2. Age: a. 18-30 years ☐ b. 31-40 years ☐ c. 41-50 years ☐ d.51- 60 years ☐

3. Educational Background: a. Non Formal ☐ b. Elementary/J.S.S/MSLC ☐ c. Vocational ☐ d. Secondary/Technical ☐ f. Polytechnic/University ☐ g. Professional ☐

4. Department of work: a. Administration ☐ b. Procurement ☐ c. Stores ☐ d. Transport ☐ e. Distribution ☐ f. Other, specify .....

5. Please indicate the position/level in which you are presently: a. Senior level ☐ b. Intermediate level ☐ c. Junior level ☐ d. New recruit ☐

6. Length of work with ECG Project Office? a. 1- 4years ☐ b. 5 – 10years ☐ c. 11 - 18years ☐ d. 18+ years ☐

7. What type of service do you provide in the logistics function?

a. Procurement and receiving of materials ☐
b. Materials management ☐
c. Distribution of electrical materials to consumers ☐
d. All of the above mentioned ☐
e. Any other (please specify).....

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SECTION B: STOCK AND INVENTORY CONTROL

1. What form of inventories do you normally handle?

a. Production Inventories [ ]
b. Maintenance, repairs, operating supplies [ ]
c. In process inventories [ ]
d. All of the above [ ]
Other (Specify).....

2. What are your sources of inventories?

a. Director Imports [ ]
b. Local Source [ ]
c. Control Depot [ ]
d. All of the above [ ]

3. Does the Project Office embark on any form of forecasting of its inventory requirements?

a. Yes [ ]
b. No [ ]

3b. If yes in question 4 above, is it?

a. Short term [ ]
b. Long term [ ]
c. All of the above [ ] Other (Specify).....

4. Do you have an Inventory Control Unit?

a. Yes [ ]
b. No [ ]

5. Where does inventory control actions originate?

a. Accounts Department [ ]
b. Central warehouse [ ]
c. Merchandise Controllers [ ] Others (Specify).....

6. What system of inventory control do you operate?

a. Fixed Order system [ ]
b. Cyclical Ordering System [ ]
c. All of the above [ ]
d. Other (Specify) .....

7. What costs of carrying inventory do you encounter in your unit?
a. Storage costs [ ]
b. Breakage's/Damages and Obsolescence [ ]
c. Insurance and Taxes [ ]
d. Stock taking, Reordering and accounting cost [ ]
e. Cost of tied down capital in inventory [ ]
f. All of the above [ ]
Other (Specify) .....

8. What ordering Costs do you encounter?

a. Transportation [ ]
b. Import duties [ ]
c. Administrative costs [ ] Others (Specify) .....

9. What tools do you use to maintain effective inventory records?

a. Inventory records [ ]
b. Inventory models [ ]
c. Computer [ ]
d. All of the above [ ]

10. Which form of stock taking do you engage in?

a. Perpetual/Continuous [ ]
b. Periodic [ ]
c. All of the above [ ]

11. What is the nature of Stores keeping practice engaged in by the Project Office?

a. Centralized [ ]
b. Decentralized [ ]

12. Who is responsible for decision making on the issue of quality, quantity and price of the stock to be purchased?

a. Stock verifiers [ ]
b. Purchasing Officer [ ]
c. Chief Store Officer [ ]
d. All of the above [ ]

13. What purchasing policy has the Project Office adopted?

a. Bulk purchase [ ]
b. Unit purchase [ ]
c. Piece, purchase [ ]
d. All of the above [ ]
e. Don't know [ ]

14. What is the nature of stocktaking used in your Organization?

a. Team-work stock taking [ ]
b. Stock-taking by store- keeper [ ]
c. Blind Stock-taking method [ ]
d. Stock-taking by stock verifiers [ ]

15. Who is responsible for effective stores control, stock holding and assessment of goods?

a. Higher Stores Officer [ ]
b. Store Keeper [ ]
c. Chief executive [ ]
d. Purchasing Officer [ ]
e. Stores Officer [ ]

SECTION C: DISTRIBUTION MANAGEMENT

1. What channel of distribution does your organisation uses?

a. Stores through third party distribution [ ]
b. Stores to agents [ ]
c. Stores direct to homes/institutions [ ]
d. Any other (please specify).....

2. What mode of transport does the Project Office use in transporting electrical materials to consumers?
a. By Sea [ ]
b. By Road [ ]
c. By Air [ ]
d. All of the above [ ]
Any other (please specify).....

3. What factor(s) influenced your decision in adopting the above mode of transportation for distribution?

a. The nature of the product [ ]
b. The size of the order [ ]
c. The size level required by the customer [ ]
d. The alternative transport mode available [ ]
e. The method of finance and the operating techniques to be adopted [ ]
f. All of the above [ ]
Any other (please specify).....

4. In your view, what percentage (%) of transport cost is added to the electrical materials you distribute?

a. Between 1% and 2% [ ]
b. Between 3% and 4% [ ]
c. Between 5% and 6% [ ]
Any other (please specify).....

SECTION D: CHALLENGES OF PHYSICAL DISTRIBUTION

1. Does the project office have all the electrical materials you need?

a. Yes [ ] b. No [ ]
2. What are some of the challenges you encounter with regards to the supply of electrical materials to consumers?

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