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A Study of the Supply Chain Management System in Ridge Hospital, Accra

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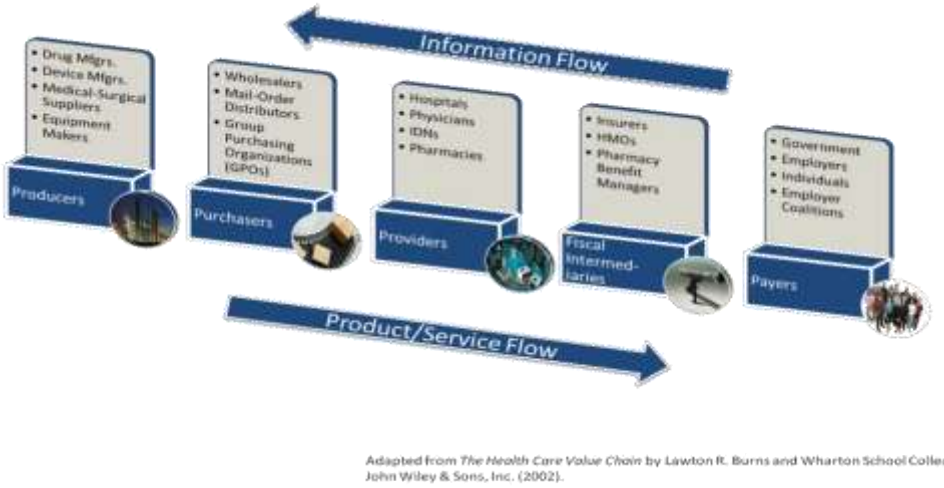
Abstract
Supply chain Management has assumed an important role in a firm's performance and has attracted serious research attention over the last few years. Companies especially those in the healthcare sector are challenged with finding ways to meet changing demand pattern of customers, to reduce operating cost and to maintain consistencies in data in order to deliver effective healthcare services. This has necessitated a study into the existing Supply Chain Management (SCM) system in the Ridge Hospital, Accra mainly because of the ongoing upgrade of the hospital into a regional hospital. The aim of this research was examine the existing Supply Chain Management System in the Hospital. In order to achieve the aim, the study sought to identify the existing supply chain management procedures and methods adopted by the Hospital, outline the challenges of the existing SCM system in the hospital and suggest measures of addressing these challenges. In the light of this, the scope of the study was focused on the Ridge Hospital, Accra only. The main research instrument used for the study was interviews. Using a convenience approach and purposive sampling technique, the target respondents were supplies managers, procurement officers, general stores and pharmacy stores officers. Using Microsoft excel, the data collected from the interviews were grouped together and were analyzed. The study revealed after the analysis that, the stages in the Hospital's SCM procedures were Procurement Planning, Sourcing, Contracting, Inspection, Storing, Distribution and Evaluation. The study further revealed that the hospital encountered challenges in its operations such as lack of finance, inadequate qualified personnel, poorly integrated information system, and non-adherence to some statutory provisions of the Public Procurement Act, Act 663. It was therefore recommended that the Hospital should adopt ICT, develop an annual training plan to build capacity of its SCM officials, employ a qualified SCM officers to coordinate rather than using national service personnel for most of their operations. Additionally, the new Regional Hospital under construction should take into consideration all the existing challenges of the Hospital such as space, drainage and proper warehouse system in order to solve these challenges.

Keywords: *Supply chain Management, Turnover Performance, Logistics Management, Inventory Information Management*

1.0 INTRODUCTION

Recently, Supply Chain Management (SCM) has gained an important status in industries and this has attracted the attention of most researchers. Industries encounter challenges such as searching for means and ways to satisfy the increasing demands and expectations of consumers at a right cost. In order to achieve this, industries need to discover which aspects of their supply chain procedures are noncompetitive, appreciate clients requests which are not being satisfied, set improvement goals, and quickly implement needed developments. Formerly, producers remained the drivers of supply chain. The rate at which products were produced and distributed was managed by these producers. Now, consumers are making the demands, and producers are struggling to meet these demands for preference and swift delivery.

Supply Chain in a Healthcare sector is the flow of several healthcare products and the participation of a number of stakeholders. The key principle of supply chain in the healthcare sector is to deliver products at the appropriate time so as to meet the needs of healthcare providers and customers, as well as reducing waste and conserving resources (Lauer, 2004). The Healthcare sector supply chain consists of manufacturers, buyers, suppliers, healthcare providers, fiscal intermediaries and payers. This is shown in Figure 1.1 below.



Adapted from *The Health Care Value Chain* by Lawton R. Burns and Wharton School Colleagues. John Wiley & Sons, Inc. (2002).

Figure 1.0.1: Healthcare Supply Chain Burns et al (2002)

In addition to the intricacy of the scheme, there is the inclusion of state owned establishments, regulatory agencies and insurance companies too (Ryan, 2005). The movement of products as shown in Figure 1.0 above commence with producers and ends with clients. A pharmaceutical product, contingent upon its sort can be conveyed by the producer to the hospital. The product, however, can be channeled through a supplier before finally delivered to the hospital. There are several issues existing in the supply of healthcare products, mainly from the wholesaler to the healthcare provider. One of these issues is the ability of manufacturers to forecast the exact demand for pharmaceutical products due to unavailability of precise information on consumption. According to Lauer (2004), the absence of a standard categorization of pharmaceutical products and the preferences of clinicians cause further uncertainties. A major way by which healthcare will become more sustainable is by concentrating on the standardization of services rendered to customers, mainly consistency from a customer's perspective. Moving forward, supply chain will guide and support thischange due to the existence of valuable data which will help ascertain best prices and outcomes. This will aid in improving wasteful and inefficient systems.

According to Schneller and Smeltzer (2006), the supply chain in healthcare sector is usually considered as extremely fragmented and comparatively inefficient. One major challenge accompanying the usual healthcare supply chain is that each phase of the supply chain functions separately. This results in conflicting goals and misaligned incentives that restrict the supply chain from functioning as a system. An integration of every segment of the supply chain where the producers, purchasers, providers, fiscal intermediaries and payers work closely will go a long way in the implementation of SCM practices. In turn, supply chain professionals will meet up often to aid in ensuring constant developments, evaluate products or results, share ideas, and come up with well-versed decisions. Furthermore, Lauer (2004) indicated that there is not much awareness of the premise of supply chain management in hospitals. Consequently, managers do not have the needed capacity to manage the supply of medication. In this situation, a couple of initiatives have commenced recently to improve customer service and reduce cost. On the other hand, there is a necessity for an improved communication and information technology (ICT) systems to sustain this, together with a computerized system of processing orders. Suppliers, mainly wholesalers should be close to the hospital to facilitate swift replenishment of stock.

1.2 Problem Statement

Globally, the healthcare sector is faced with challenges such as; inability to meet changing demand pattern (Danese, 2004), constant increase in working expenditure which is caused by ineffective centralized materials management and supply system (Kumar et al.,2008) and data inconsistency leading to ineffective healthcare services (Gibbons, 2009). Drawing from the position of the earlier researcher, in a developing country like Ghana, SCM in healthcare sector is also toppled with the challenges indicated earlier. The Ridge Hospital in Accra is a presently being upgraded by the Ministry of Health and its partners into a Regional Hospital. This has necessitated the study of their existing Supply Chain Management System to ascertain if it can support the new requirements of a Regional Hospital.

The conversion of the Ridge Hospital in Accra into a Regional hospital will result in a rise in the number of patients which will also result in high demands for healthcare products. Therefore, there will be a need for a good

supply chain management system in place to meet the increasing demands of the healthcare products. The Government Hospitals in Ghana, including the Ridge Hospital, Accra however lack adequate finances to carry out their operations (Ansah, 2004). Consequently, the hospitals are not able to procure enough logistics needed to carry out their duties more effectively.

Additionally, due to the unique nature of healthcare products the hospitals in Ghana is faced with a common problem which is stock unavailability during emergency cases. With consumer products, customers can either postpone their purchase or obtain an alternative when the product is not available, however in the healthcare sector there is no substitute treatment for the patient. Most patients lose their lives due to this problem. Quality moreover is an important measure of healthcare supply chain performance due to the specialty of healthcare service. Quality assurance is an important healthcare supply chain function which needs much attention especially in a situation where there is an increase in the number of patients due to the conversion of the hospital into a regional hospital. This will ensure that patients receive safe therapies; problems will also be contained and reduced. The above mentioned problems and issues raised have necessitated a study into the Supply Chain Management (SCM) system at the Ridge Hospital, Accra mainly because of the ongoing upgrade of the hospital into a regional hospital.

2.0 LITERATURE REVIEW

2.1 Definition and Concept of Supply Chain Management

In order to appreciate the concept of supply chain management, key terms are defined; the role of management is also discussed so as to arrive at the definition of Supply Chain Management. Supply chain can be defined as a system of organizations, activities, people, information, and resources concerned in moving a service or product from suppliers to customers. Supply chain processes entail the conversion of raw materials, natural resources and components into finished product that is finally delivered to the end user (Burns, 2002). According to Mentzer et al. (2001) the definition of "supply chain" is reinforced as the definition of supply chain management. He tried to come up with a common definition of a supply chain, based on a research study conducted by several co-authors. They came up with the following definitions in his write-up: "A supply chain is defined as a set of three or more entities (organizations or individuals) directly involved in the vertical flow of services, products, finances, and information from a source to a customer".

The supply chain may include specific departments or divisions of the company as well as external suppliers that provide input to a focal company. With supply chain one supplier can be a source to another supplier until the product or service reaches the final customer. (Handfield and Nichols, 1999). Supply chain of a company is made up of a supplier network that provides a product or service and its distribution channel. Organizations can serve as part of several supply chains. Different types of supply chains have been defined by Mentzer et al. (2001) based on the complexity of supply network. They are: A customer, a supplier and a company which he refers to as direct supply chain; Suppliers of the immediate supplier, as well as customers of the immediate customer which he refers to as comprehensive supply chain; and All the organizations involved in the provision of raw materials and or services and the distribution flow which he refers to as ultimate supply chain.

Drucker (2008) in his book "The Principles of Management" defines Management as an adaptable organ that manages the business and its managers, work as well as its workers. Longman dictionary of contemporary English defines management as the process of organizing and controlling the work that an entity does. According to Rozman (2000), most authors describe management as bringing together of divided activities or managerial practices or functions in an organization. Donnelly et al. (1995) also defines management as the steps taken by one or more people to bring together the activities of others to accomplish outcomes not possible to attain by an individual single handedly. Hellriegel and Slocum (1996) define coordination as bringing together of the activities executed by different individuals, departments and teams. An organizational process and a business are the two interwoven processes in an organization that need to be coordinated: (Rozman, 2000). Some authors do not differentiate between business and organizational processes in the same way. Therefore, management is most commonly defined as planning, organizing, leading, and control of human, material, financial and informational resources.

2.1.1 Planning: Planning is designing the desired future and efficient ways to achieve it (Ansoff, 1990). Rozman (2000) also defined planning as the process of thinking creatively about the future that ends with a plan. Rozman (2000) further describes planning mainly as a process of goals coordination, targets and strategies, as well as delegating and decision-making. The main purpose of planning is resolving and preventing problems, by evaluating different possible scenarios.

2.1.2 Organizing: Organizational processes enable the creation of a certain structure of permanent relations among employees in the company. These relationships enable the execution of the goals and plans of the company. This requires leadership, through communication and motivation of employee to execute the planned activities.

2.1.3 Controlling: Controlling is concentrated on behaviour of employees and audit of the systems put in place and achievements seen in relation to those planed and taking action to those plans in case deviations are encountered. We can conclude that management is planning, leading people and controlling. Even though for the last decade academia and industry have researched into the concept of supply chain management, there is still no consistent way of describing the concept. Consequently, there is lack of consistency in clarity and meaning across the different definitions of SCM available in the literature. According to Bolumole (2000) supply chain management proposes an integrated philosophy for running an organization's buying and distribution processes based on a marketing point of view. Persson (1997) concluded in her study that Supply chain management is a homogenous concept. Many scholars and professors have defined Supply Chain Management; however, that of Professor Emeritus of Supply Chain Management at Ohio State University and Bernard J. (Bud) LaLonde is one of the best definitions of supply-chain management offered to date.

According to LaLonde supply chain management can be defined as the delivery of economic value and enhanced customer through coordinated management of the flow of physical supplies and related information from sourcing to utilization. Accomplishing the actual prospective of supply-chain management involves incorporating these entities within the organization and the external partners. The external partners include the ultimate customers, customers, carriers, distributors and suppliers. According to Northouse (2007), all the external partners are central players in what he calls the extended supply chain. He stated that the extended enterprise has a goal of doing a better job of serving the ultimate consumer. He further on indicated that superior service leads to better market share. An increased share can result in competitive advantages such as lower transportation and warehousing costs, less waste, reduced inventory levels and reduced transaction costs. Singh (2004), vice president of integrated supply-chain management at Xerox confirmed that the consumer is the key to both measuring and communicating the supply chain's value. He stated and explained that you can attach customer values to profit & loss and to the balance sheet if you can start quantifying customer satisfaction coupled with what a supply chain can do for a customer and also link customer satisfaction in terms of earnings or revenue growth. Around the world, the best companies are realizing a potent latest source of competitive advantage. This is called supply-chain management which comprises all of those incorporated activities that bring goods to the market and create customer's satisfaction.

2.2 Healthcare Supply Chain Management

The current position of the healthcare sector relative to limitations and ways of implementing Supply Chain Management principles has been indicated in the following literature reviews. One of the major issues facing the healthcare sector is cost. Heinbuch (1995) explained a method of solving the challenge of reducing healthcare cost through the hospital's inventory management function. Alverson (2003) also explained the significance of a well-organized management of inventory for healthcare providers and outlined severe effects of usual procedures used for purchasing in hospitals. He suggested serious consequences such as; excess inventory levels, workflow interruptions, lack of inventory control, missed contract compliance, frequent stock-outs and costly emergency deliveries, increased health system labor requirements and expensive rework. Some solutions to inventory management in the healthcare sector have been provided by the literature on information technology (IT). Burns (2002) deliberated on the accumulation of suppliers and their supplies using electronic catalogues, visibility of materials and orders, as well as efficiency in procurement. Schneller and Smeltzer (2006) suggested that e-procurement schemes can assist to drastically cut down purchasing costs by consolidating supplier networks and formation of supplier partnerships. Moreover, the use of ERP systems, which make available a mechanical and paperless format for the flow of data through an organization, can also reduce administration and transaction costs.

2.2.1 Current Problems in the healthcare sector

Healthcare sector suffers from inexact and inconsistent information on products in the US. This influences the rest of supply chain negatively. Gibbons (2009) stated that, healthcare is an information intensive environment and the availability of quality information is essential for the delivery of safe and effective healthcare services. According to Pleasant (2009) there has been wastage of more than $11 billion due to unproductive processes, errors in orders and invoices and archaic information technology each year. Furthermore, supply chains in the healthcare sector exist as extremely fragmented system. This is due to that fact that providers, wholesalers, distributors and manufacturers function separately from each other. This situation set hurdles to the task of linking the thousands of associates concerned at any phase in the chain (Dobrzykowski and Vonderembse, 2009; Burns et al., 2002). Burns et al. (2002) confirmed that all parties in healthcare sector up to date lacks knowledge sharing coordinated effort and strategic alliance formation.

Additionally, inefficient inventory management contributes to discrepancy in stock levels. The Chapel Allerton Orthopaedic Centre (CHOC) in UK had an inefficient management of their inventory and this contributed to

overstock problem. The centre spent an amount which exceeds £3 million per year on inefficient inventory management (Medwell, 2009). It is therefore obvious that inefficient processes lead to avoidable cost and poor performance in the healthcare industries (Kumar et al., 2008).

Table 2.0.1: Outline of Current Problems in Healthcare Industry

Key Findings	Categories of Problems	Research
All parties in healthcare industry still lack coordinated effort, strategic alliance formation and knowledge sharing	Inconsistency in Data & Fragmented system	Burns (2002)
Inefficient incorporated information framework	Inconsistency in Data & Fragmented system	McGrath and More (2001)
The usual client managed inventory results in the failure to meet changing demand pattern and an increase in transportation costs	Ineffective business procedure	Danese (2004)
In-built inefficiencies, employment and retaining issues within the pharmacy business have influence on the healthcare service and patient security	Ineffective business procedure	McRobbie (2003)
An incoherent system in healthcare sector narrowed communication between parties	System is Fragmented	Dobrzykowski and Vonderembse (2009)
Prescription errors happened in European countries which were brought about by similar drug names, resemblance in the external appearance of medicines' packs, labeling and unclear labeling information	Inconsistency in Data	EFPIA (2008)
Rising working expenses is created by the centralized supply framework and material management	Ineffective business procedure	Kumar et al. (2008)
Judgment based on low quality data gives inefficient healthcare services which adversely influences the result of treatment for patients.	Inconsistency in Data	Gibbons (2009)
Experienced of high stock levels and system integrity by the Chapel Allerton Orthopaedic Centre (CHOC)	Ineffective business procedures & Fragmented system	Medwell (2009)
Healthcare industry in the US experiences conflicting and inaccurate product data which adversely affects the rest of supply chain	Inconsistency in Data	Pleasant (2009)
Healthcare industry in Shanghai suffers from Traceability issues in Implanted Medical Devices	Inconsistency in Data	Yan (2009)
Ineffective cold chain management during transportation influences the quality and steadiness of temperature-sensitive products	Ineffective business procedure	Sooksriwong and Bussaparoek (2009)
Due to the varied management system in the		

hospital, providing co-ordinate care was difficult	Ineffective business procedure	Nicholson (1995)

2.2.2 Performance of the healthcare sector in Developed Countries

In order to present some point of view on supply chain performance, it will be helpful to consider the standard of measurement for developed countries. The number of orders filled within a specific period of time is a common metric of supply chain performance in developed countries. The usual order fill rate from distributors to pharmacies in 24 hours of an order being placed is 95 percent in the United States. That of retailers to customers is greater than 99 percent. This is higher because the retailers also have stock (Healthcare Distribution Management Association, 2008). Also, according to Clement and Walter (2005), a study of European Union countries discovered that 96 percent of orders were filled within a period of 45 minutes of being placed. Stock levels in developed countries are measured in days by contrast with developing countries where stock levels are measured in months due to long lead times and occasional order cycle. In developed countries, supply chains for medications focuses on availability, efficiencies and quality. The United States wholesale distributors report confirmed that their overall net cost accounts for less than 2 percent of the total value delivered (Healthcare Distribution Management Association, 2008).

2.2.3 Performance of the healthcare sector in developing Countries

Assessing the performance of supply chains in developing countries is controlled by a number of factors. Some of these factors are inadequate finances which result in unavailability of medication and lack of performance data.

2.2.3.1 Financial Issues: Often, it is difficult to say whether or not performance or availability of medicine is due to insufficient financing for supplies or supply chain factors. Information on order fill rates for developing countries is not often available. Order fill rates in Cameroon for the Content Management System (CMS) over a six-month period according to Govindraj and Herbst (2006) were 69.5 percent, while in Senegal they were 65 percent in 2005 and 49 percent in 1995 for the CMS. Stock out rate is the most widely recognized metric of supply chain performance in developing countries. A stock out can have massive negative health outcomes as amenities are usually rarely resupplied and alternatives for patients are constrained. A restricted number of items are used to assess stock outs picked on account of the importance of their well-being. A standardized strategy to evaluate the accessibility of medicine based on surveys of price, affordability and availability has been developed by the WHO and Health Action International (HAI). The medicines used in the survey incorporated a standard list of core medicines selected to replicate the cure for regular acute and chronic conditions in a country that considerably add to mortality and morbidity. Surveys are done in a representative sample of public and private amenities. Cameron (2008) revealed in a secondary analysis of 45 surveys using this methodology that; mean availability for a basket of core medicines in the public sector ranged from 38.2 percent in sub Saharan Africa to 57.7 percent in Latin America and the Caribbean. The mean availability in the private sector ranged from 44.5percent in East, Southeast, and South Asia to 79.4 percent in Central Asia. The availability of the overall mean was higher in the private sector at 63.2 percent than for the public sector at 34.9 percent.

2.2.3.2 Performance Data: Those involved in supply chain in developing countries do not routinely screen and give account of their performance. This is a noteworthy sign of imperfect performance. In cases where there is monitoring, it is usually in light of intermittent survey data for an incomplete set of indicators.

2.2.4 Improving Performance and Supply Chain Integration

As indicated in the above mentioned situation, we then consider another perspective of literature review so as to discover how healthcare sector adopt the technique to lighten these issues and enhance their operational performance. Standardization is concerned in order to promote operational change and healthcare supply chain integration. According to Kreysa and Denecker (2009) implementation of supply chain standard data contributes to data synchronization so that all partners in the business can speak about the same electronic language. At Present, healthcare providers endeavor to coordinate upstream with the distributors, producers and wholesalers (Rossetti, 2008). Subsequent to the execution of procurement, enablement technologies furnish the NHS with a chance to significantly improve its ability to manage procurement information, enhance its procurement and commercial procedures and eliminate waste and replication (Gibbons, 2009). The Project Electronic Commerce and Communication for Healthcare (PeCC) in Australia is developed to bring e-commerce practices into the health industry with about 700 suppliers, mechanizing pharmaceutical and different supplies to healthcare providers. A web-based platform facilitates supply chain correspondence permitting more effective cooperation between manufacturers, wholesalers, suppliers, retail and hospital pharmacies (McGrath and More, 2001).

It is observed that healthcare providers who are acquainted with communication and information do better in their quality of care and delivery. They therefore endeavor to apply information technology in order to help their patients get access to information easier than previously. The subject of e- health service is a substantial one (Dean, 2003). One of healthcare providers in UK (NHS Direct) developed an NHS Direct website which provides 24/7 access to information and clinical advice as well as providing self-guidance. It has set up itself as Europe's leading from 1999 to date (Gann, 2003). Germany is taking the foremost step to build up and actualize a national telemetric infrastructure. The main benefits will spring typically from the incorporation of Enterprise Resource Planning (ERP) and the development of integrated data flow that supports patient-centered care (Mainz, 2003).

Business process redesign is used in healthcare industry to implement organizational changes towards more cost-effective and customer-focused care (Burns et al., 2002). Levary (1997) emphasized on the design of physical facility, communication and information management while studying a re-engineering project in hospital emergencies room. McRobbie et al. (2003) also studied the introduction of pharmacy service close to the patient ward to make the process of discharging a patient easier. The quality use of medicines, appropriate use of skill mix and Efficiency of service is the outcome of re-engineering pharmacy service.

A trust in UK (Derbyshire Royal Infirmary), commenced a business process re-engineering project. Emergency and accident was chosen as a pilot site. According to Nicholson (1995), this project focuses on varying the role of specific culture to make it more flexible and responsive to unexpected alteration in workload. A new re-engineered system was implemented by Gujarat Cancer Research Institution. The centralized organizational structure at the time was replaced with the new decentralized structure. There was an administrative officer at the same level as the deputy director, three deputy directors and three directors in the new organizational structure. These officials were given the mandate to manage each one's own division effectively and efficiently (Ramani, 2006).

3.0 METHODOLOGY

3.1 Introduction

This chapter consists of the research design, sampling techniques, population, data analysis and collection tools or procedures. Main issues of consideration are the source of the data, study approach, sampling techniques, data collection method, and data preparation and analysis. The chapter provides an overview of the methodological approach and the research design selected for the study. The methodology included the data, their sources and an outline of the analyses.

3.2 Research Design

The overall plan that one selects to incorporate the different components of a study in a logical and clear way, thus, making sure one addressed the research problem effectively is a research design (Labaree, 2009). It constitutes the plan for the gathering, measurement and analysis of data. Research design furthermore signifies how a researcher assembles a research study to answer a set of research questions. Research Design outlines the study, the researchers' techniques for aggregation, the limitations of the research and details on how the study will arrive at its logical conclusions (Wills, 2003). The research design employed made use of qualitative approach to explore the main aim thus supply chain management system in the Ridge Hospital, Accra and with respect to this, a census survey was conducted. The data collected were qualitative in nature. The main idea was to get an understanding of fundamental inspirations and reasons behind stakeholder's opinions. In order to discover the existing supply chain management system in the Ridge Hospital, the researcher carried out the following activities:

- Conducting of interviews;
- Visual observations of processes; and
- Examination of records to verify the information provided by the respondent.

3.3 Study Population

The population is the complete set of cases from which a sample is taken (Saunders et al., 2007). The population in this study consists of the hospital's pharmaceutical manufacturers, distributors, wholesalers and retailers, storage facilities, hospital pharmacy, supplies officers and patients. The Hospital's Administration indicated that there were only twelve (12) officials involved in supply chain management procedures hence the study population. The Ridge Hospital was chosen as a study area because of the ongoing transformation of the hospital into a regional hospital. Furthermore, it offers healthcare services to a large population of people living in Greater Accra Region.

3.3.1 Sample Size

It is important to determine the sample size in every research due to a number of factors such as allowable sample error, the risk of selecting a "bad "sample and the population size (DeVaus, 2001). There are number of

approaches to determine the sample size. These include applying formulas to calculate a sample size, using a census for smaller populations, imitating a sample size of similar studies and using published tables. The Hospital's Administration indicated that there were only twelve (12) officials involved in supply chain management procedures. Due to the small number of the population, census was therefore used as the sample size for the study thus considering the entire population. The research sample enabled the researcher to ascertain the existing supply chain management system in the hospital. The sample for this research comprised supplies managers, procurement officers and pharmaceutical and general stores administrators.

3.3 Sampling Technique

Sampling technique provides a range of methods that permits you to decrease the amount of data you need to gather by considering only information from a sub group (known as a sample), rather than all possible cases or elements (Saunders et al, 2007). The reason for taking a sample is to acquire an outcome that is illustrative of the entire population being sampled without experiencing the inconvenience of asking everybody. The purposive sampling technique was used to select the study area because it seeks to get all possible cases that fit particular criteria (Lind et al., 2005). The researcher targeted the hospital's officials who were directly involved in supply chain management and sought their opinions on the existing supply chain management system in the hospital.

3.4 Data Collection Tools / Procedures

The aim of this study is to identify the existing SCM system in the Ridge Hospital and develop it in order to sustain the increasing requirements of a Regional Hospital. The challenges in the supply chain management were ascertained as well as the impact on public health and safety. In line with the recommendations of Eisenhardt (1989), different methods were used to collect data including visual observations of processes, examination of records and interaction with respondents. The main primary data gathering instrument for the study was interviews.

3.5 Data Analysis

The data analysis of this study comprised translation; review, categorization, summary and interpretation of the data collected to draw empirically based conclusions. Subjective strategy was utilized to investigate the information. The initial step the researcher took was to transfer the recorded audio into writing which is known as Transcription and included close observation of the information through repeated cautious listening. Secondly, the researcher reviewed and examined the purpose of the study and what should be discovered. This implied that the researcher needed to recognize a couple of compulsory questions that would help to achieve a positive outcome of the study and noted them down. The researcher also sorted out the information by their corresponding questions in order to identify consistencies and differences in the data. The researcher moreover categorized the information gathered which was referred to as indexing or coding the data. This procedure helped the researcher to distinguish the contrasting views from the raw data gathered. The coded dated additionally helped the researcher group the respondent into limited number of categories. The researcher further on summarized the data capturing the likenesses or contrasts in the officers' responses. Finally, the information gathered was interpreted. Computer data analyses software such as the use of Microsoft Excel software was the main tool employed to analyze the data in order to help interpret outcomes. The information was presented in tabular, graphical and narrative forms. The descriptive statistical tool used in analyzing the data was pie charts which made the data analysis easier and gave precise pictorial representations of the information gathered.

4.0 DATA ANALYSIS

This chapter presents the analysis of data gathered from the field with the aid of interviews. The Interview was intended to collect data that will help the researcher to examine the existing supply chain management system in Ridge Hospital, Accra. Issues to be discussed will comprise the general information of the respondent, supply chain management procedures, issues affecting the performance of the respondent, techniques and methods for assessing the performance of the respondent, supply chain management challenges facing the Ridge Hospital and upgrade of the supply chain management system in the Ridge Hospital. Using a closed and opened-ended interview questions, the opinions of the respondents were collected and were analyzed with the aid of Microsoft Excel Software.

4.1 General Information of the Respondent

The study sought to inquire into the educational background of the respondents, years of service and their area of specialty at the hospital. The aim was to find out whether the officers who were involved in the supply chain management processes had the required experience and qualifications to carry out their duties.

4.2 Supply Chain Management Procedures

This question sought to find out the various supply chain management procedures and methods that were used by the hospital. In connection with the responses, respondents indicated the following stages in managing their supply chain;

4.2.1 Planning stage:

The Hospital's procurement unit undertakes annual procurement planning of requirements from various departments usually three months to a fiscal year. The plan indicates the contract packages, estimated cost for each package, procurement method and processing steps and times. The plan is then summited to the Entity Tender Committee for approval. The Unit then initiates the procurement process for the various requirements of the Hospital by first preparing specifications of the requirements. One respondent stated that: "The annual procurement plan was sent to the Entity tender committee for quarterly review" (respondent view). Some respondent however emphasised the need for improved procurement documentation from the planning stage. This was to allow for transparency and easier auditing procedures.

4.2.2 Sourcing:

The procurement methods used by the Hospital are Sole Sourcing (SS), National Competitive Tendering (NCT), and Price Quotation (PQ) and Restricted tendering (RT). The supply sources of the Hospital were registered suppliers and existing suppliers. Tenders received from various suppliers were evaluated by an evaluation committee. The lowest evaluated responsive tenderer was recommended for an award of contract by the evaluation committee. The procurement officers indicated that: "*The most common procurement method used is the National Competitive Tendering as it encourages competition and the attainment of value for money*" (respondent view). Some respondents however indicated that Sole Sourcing method of procurement becomes necessary when a particular pharmaceutical product can be obtained from only one distributor or supplier. Though, respondents also indicated that they sought approval from PPA before using the Single Sourcing method.

4.2.3 Contracting:

The successful supplier was then awarded the contract. All other tenderers were notified of the results. There was subsequent formation of contract agreement between the Hospital and the Supplier. One respondent stated that: "*The procurement unit sometimes did not notify tenderers who emerged as losers. Consequently, tenderers were not encouraged to tender for subsequent contracts due to lack of trust*" (respondent view).

4.2.4 Inspection and Acceptance:

Goods which were delivered to the Hospital's stores were inspected by an Inspection Team. The team comprised officers from the Internal Audit, Procurement Unit, Stores and Monitoring Departments. The team ensured that the technical specifications of the goods supplied conform to what was stated in the tender document. Acceptance of goods was based on correct quantity, technical standards and submission of documents required for payments. One respondent from the general stores indicated that: "*Due to ineffective inspection, items close to expiry were sometimes received to stores and those items became obsolete within the shortest time causing financial loss to the hospital*" (respondent view). Some respondents from the pharmacy stores however claimed that items which were close to expiry were issued out first before issuing out items with latter dates.

4.2.5 Storing:

The Hospital's General stores is in charge of storing general supplies such as stationery, tonners, gloves, beds among others. The pharmacy stores are in charge of storing pharmaceuticals. Inventory management, demand scheduling and stock planning are usually done manually with the aid of ledger books, stores received advice, and tally cards. One respondent from the pharmacy stores indicated that: "*Cold chain medicines were supposed to be stored appropriately so as to prevent them from going bad*" (respondents view). According to some respondents, the hospital had proper mechanism in place to store the cold chain medicines.

4.2.6 Distribution:

The various departments in the hospital which required any of the stock items puts in a request using the requisition and issue voucher. The vouchers were authorized and approved before items were issued out.

4.2.7 Evaluation:

To assess compliance, efficiency and effectiveness the Stores liaised with the internal Audit Department to carry out stock taking exercise. External Auditors also conducted annual procurement audits at the Hospital. The Public Procurement Authority (PPA) moreover carried out an end of year assessment exercise of all procurement processes at the hospital.

4.3 Issues Affecting Performance of Respondents

4.3.1 Basic principles or factors affecting performance

This question sought to find out the principles and factors that affected the performance of the Hospital. Varying responses were obtained from the respondents. They are:

- Lack of finances due to insufficient budget allocated to the hospital for its operations;
- Inadequate qualified personnel since most operations are carried out by national service personals;
- Poorly integrated information system;
  - Non adherence to some statutory provision of PPA Act 663;
  - The traditional customer managed inventory leads to the inability to meet changing demand pattern; and
  - Delays in delivery of items by suppliers.

From the above mentioned responses obtained from the study it can be deduced that factors affecting the performance of the Ridge Hospital correspond to what was stated in the literature review.

4.3.2 Accountability

According to the Business Dictionary, accountability is the obligation of an individual or organization to account for its activities, accept responsibility for them, and to disclose the results in a transparent manner. It also includes the responsibility for money or other entrusted property. The essence of accountability is to strengthen the perception of transparency and fairness as well as reducing the incidence of corruption. The respondents indicated that, both internal and external auditors make constant follow ups on the supply chain processes in the Hospital.

4.3.3 Internal Processes to Curtail Inefficiencies

This question sought to inquire into the internal processes used to curtail inefficiencies in managing the supply chain in the hospital. Adherence to strict procurement rules and Periodic Procurement Auditing were the common answers among the various responses. Other processes stated by the respondents were: Monitoring of deliveries; Inspection of deliveries by a team; Ensuring the usage of right specification; and Ensuring that the right quantity is always purchased at the right time and at the right price.

4.3.4 Moral Principles and Work Ethics

According to (Wee, 2000) Ethics are the moral principles or values that guide officials in all aspects of their work. Ethical behavior is important in public procurement as it involves the expenditure of public money and it is subject to public scrutiny. Responding to the question of the moral principle or values that guide officials in all aspects of their work in their entity, the most common principle that was cited by the respondents was by the Application of the Ethics of their Profession. The respondents also mentioned responses such as the Hospitals internal code of ethics and Fairness as some of the principles that guided the officials in all aspects of their operations.

4.3.5 Training and Professional Development

This question sought to enquire how often the Hospital conducted training for officers that were engaged in SCM. In response, respondents indicated that in house training was organized for some staff at the Hospital. None of the respondents had undertaken any training programme within the year. This shows that training and professional development of individuals involved in SCM was not given much prominence and attention it deserved.

4.4 Techniques and Methods for Performance Assessment

On the issue of how the performance of the Hospital was assessed in terms of its procurement and SCM practices, all the respondents stated that their entity had a periodic auditing by the Public Procurement Authority. Checks from PPA indicated that, the Ridge Hospital has not improved their performance over the years since they keep on repeating the old mistakes and not always following the due process as enshrined in the Public Procurement Act 2003 (Act 663).

4.4.1 Customer Satisfaction

Customer satisfaction is a marketing term that measures how products or services supplied by a company meet or surpass a customer's expectation. Customer satisfaction is important because it provides marketers and business owners with a metric that they can use to manage and improve their businesses. On the issue of customer satisfaction all respondents indicated that their services to customers were very good. Apparently, the scope of study did not consider customers (patients) because the focus was on professionals at the Ridge Hospital.

4.4.2 Bench Marking

This is a method by which the Hospital may compare its own operations in various aspects with comparable external Hospital known for its excellence. With regard to a question on which institution served as a yardstick for excellence which the Hospital compared its own activities in various aspects of their SCM, none of the respondents gave a concrete answer.

4.4 Supply Chain Management Challenges

This question sought to enquire into the SCM challenges faced by the Hospital. In response, all respondents indicated that one of the Hospital's major challenges was the issue with space. Other issues were: Poor drainage system which caused flood at the general stores destroying most of the stores items; There were no Pallets in the stores to support the items; There were no CCTV cameras in the stores to control theft; and Most operations were done manually which creates data inconsistencies.

4.5.1 Measures to address challenges

This question sought to know how the hospital intends to address these challenges. In response the respondents indicated that they hope the ongoing conversion of the Hospital in a regional hospital will solve all their current challenges. One respondent indicated that: "*A committee had been set up by the management of the hospital to enquire into the various challenges facing the Hospital. All these challenges have been considered before the commencement of the new project*" (respondent view). Most respondents confirmed that a team was sent to all departments to take note of the challenges in the departments. Members of staff provided inputs which will be addressed by the committee and incorporated in the upgrading exercise.

5.0 CONCLUSION

This chapter outlines the summary of the study. The findings are presented in direct response to their specific objectives. Some problems of the existing SCM system in the Ridge Hospital and recommendations have been outlined in this chapter to help improve the system.

5.1 Summary of Findings

The research sought to access the existing SCM system in the Hospital by specifically looking at the Hospital's SCM procedures. The study also sought to analyze the problems that the Hospital encounters in its operations. After a series of reviews and analysis of the raw data collected, the following findings were outlined.

Supply Chain Management Procedures: With regard to the Hospital's SCM procedures which are Procurement Planning, Sourcing, Contracting, Inspection, Storing, Distribution and Evaluation the study revealed the following: The Hospital was aware of the need for the preparation of procurement plan and the mostly used methods are National Competitive Tendering and price Quotation. Furthermore, it was realized that Sole Sourcing was mostly used for procurement purposes. On monitoring and evaluation, two main processes were used to undertake monitoring namely; Entity Tender Committee comparing the planned budget with the actual budget at the end of the financial year and using formal procurement audit; and Bodies that undertook the monitoring and evaluation of the entity were the PPA, Entity Tender Committee, Monitoring Department and Auditors. Through the observation of Assessment and Audit reports of the Hospital, the Hospital's performance was average and needed improvement.

Factors affecting Performance: Various principles that affected the performance of the procurement entity were Lack of finances, inadequate qualified personnel, Principles of thresholds, Unethical behavior and Non adherence to some sections of the Act 663, poorly integrated information system, delays in delivery of items by suppliers. Respondents also indicated that there was the need for accountability in the SCM process of the Hospital. Reasons given by respondents were the Elimination of corrupt practices, Ensuring value for money, Adherence to the Act 663, Transparency in Public Funds and the Impact of SCM on the health service. Again, all the respondents indicated that the use of ICT in their operations was very low because no specialized procurement software was available hence almost all their procurement activities were done manually. The Internal Processes used to curtail inefficiencies in their operations were; Adherence to strict procurement rules, Periodic Procurement Auditing,

Monitoring, ensuring the usage of right specification and ensuring that the right quality was always purchased at the right price. In connection to training and professional development of officials engaged in their operations, majority of the respondents stated that it was usually done in house when the need arises.

Performance Assessment Techniques and Methods: On the issue Techniques and methods for Assessing Performance of the Hospital, all the respondents stated that their entity had a periodic auditing by the Public Procurement Authority as the only form of assessment. On the issue of benchmarking, none of the respondents cited any institution.

5.2 Conclusion

From the above analysis and discussions, it can be concluded even though the Hospital has a well-planned SCM procedures, they lack the requisite logistics needed to carry out their operations more effectively. Almost all procurement activities were done manually because there was no specialized procurement software. Hence the use of Technology and ICT was almost negligible. There is difficulty in obtaining funds hence handicapped in their procurement operations. Training and Professional development officials involved in SCM at the Hospital was not given much prominence and attention it deserved. The conclusions expanded above depict that the SCM system in the Ridge Hospital needs to be improved in other to support it when converted into a regional Hospital.

5.3 Limitation of the Study

Research on healthcare supply chain management is an extensive area of study; therefore, the researcher concentrated on the hospitals supply chain systems. Due to time constraint and lack of other resources the researcher used a fairly limited sample size from the hospital. Below are some the challenges that were encountered during the study: Unavailability of targeted respondents who by their nature of work had very busy schedules; Unwillingness of the targeted professionals to provide detailed and accurate information due to conflicting interests making data collection difficult; and Targeted respondents were not available and postponed a meeting for the study which caused delays in the collection of the data. Patients of the Ridge Hospital were not considered in the study.

5.3 Recommendations

In the light of the findings, discussions and the conclusions, the following recommendations are hereby outlined: The Hospital should adopt ICT in their operations by providing specialized procurement software to offer excellent services to clients in a more effective and transparent manner; The Hospital must develop an annual training plan to build capacity of its Supply Chain Management (SCM) officials; The Hospital needs to employ qualified SCM officers to coordinate rather than using national service personnel for most of the hospital's operations; and The new regional Hospital under construction should take into consideration all the existing challenges of the Hospital such as space, drainage and proper warehouse system in order to solve these challenges

DATA PRESENTATION, ANALYSIS AND PRESENTATION OF FINDINGS

4.1 INTRODUCTION

This chapter presents analysis and discussion of findings obtained after collecting data from primary and secondary sources, the findings are coded, edited, presented in form of tables, frequencies and final discussions to give insight in answering the research questions by finding out how inventory and stores management practices affect turnover performance.

4.2.1 Departments on Central Medical Stores

Table 1: Distribution of staff in Functional areas

Departments	Frequency	Percentage (%)
Transport and logistics	9	18
Finance and accounts	12	24
Audit	2	4
Marketing and stores	22	44
Procurement	5	10
Total	50	100

Source: Primary data

Results in table 1 above indicate that 44 percent of staff were in the marketing functional area and the least staff were in the Audit function. This implies that inventory management practices and turnover information was obtained from relevant staff.

4.2.2 Duration of staff

Table 2: Duration of staff in the organization (CMS)

Period	Frequency	Percentage (%)
1-2 years	9	18
3-4 years	8	16
5-6 years	21	42
7 and above	12	24
Total	50	100

Source: Primary data

Results in Table 2 indicate that 42 percent of the staff had experience of 1 year and above in the organization implying that they had enough information regarding inventory and stores management practices and turnover performance in Central Medical Stores.

4.3 EFFECTIVENESS OF INVENTORY MONITORING

4.3.1 In order to establish the effectiveness of stock out warning mechanism in the system of Central Medical Stores. The following responses were established.

Table 3: Effectiveness of stock out warning mechanism

Response	Frequency	Percentage (%)
Large extent	22	44
Small extent	15	30
Moderately	12	24
Not at all	1	2
Total	50	100

Source: Primary data

According to Table3, there exists a good stock out warning mechanism in the system of Central Medical Stores portrayed by the results 44 percent of the respondents.

4.3.2 To establish the extent to which stock becomes obsolete in Central Medical Stores the respondents' answers were as follows.

Table 4: Extent to which stock become obsolete

Response	Frequency	Percentage (%)
Large extent	16	32
Small extent	17	34
Moderately	10	20
Not at all	7	14
Totals	50	100

Source: Primary data

The finding in Table 4 indicate that stock became obsolete at a small extent represented by 34 percent this indicates that there is an efficient system to handle inventory.

4.3.3 Extent to which physical inventory varies from the system's stock taking, the following responses were given.

Table 5: Extent to which physical inventory vary at stock taking

Response	Frequency	Percentage (%)
Large extent	11	22
Small extent	13	46
Moderately	24	48
Not at all	2	4
Total	50	100

Source: Primary data

Results in Table 5 indicate that physical inventory varied moderately at stock taking indicated by results 48 percent implying that inventory monitoring system were effective.

4.3.4. To obtain information on the extent to which economic order quantities are achieved the respondents provided the following information.

Table 6: Extent to which economic order quantities are achieved

Response	Frequency	Percentage (%)
Large extent	18	36
Small extent	9	18
Moderately	16	32
Not at all	7	14
Total	50	100

Source: Primary data

Results in table 6 above shows that Economic Order Quantities are achieved to a large extent as reflected in results above with (36%) however there were minimal difference between respondents who said moderately.

4.4 EFFECTIVENESS OF INFORMATION MANAGEMENT

4.4.1 To establish the effectiveness of information management system the respondents were asked how long it took to update the system and the responses were;

Table 7: How long it takes to update the system

Response	Frequency	Percentage (%)
Immediately	29	58
Daily	13	26
Weekly	8	16
Total	50	100

Source: Primary data

Results above indicate that the system is updated immediately with the transactions made as indicated by the respondents with (58%).

4.4.2 To obtain information on how fast the system generates the required information for corporate use respondents were asked and the following were the responses

Table 8: How fast the system generates required information

Response	Frequency	Percentage (%)
Immediately	29	58
Daily	5	10
Weekly	14	28
Monthly	2	4
Total	50	100

Source: Primary data

Results indicate that information was obtained for corporate use by the system immediately as the respondents respond immediately with (58%) this indicated that the information collected was relevant to the organization when ever it was required.

4.4.3 To establish the how often the system was backed up respondents were asked the question whether the system was backed up the following results were obtained.

Table 9: How often the system is backed up

Response	Frequency	Percentage (%)
Immediately	25	50
Daily	9	18

Weekly	9	18
Monthly	7	14
Total	50	100

Source: Primary data

Results above reflect that the system is backup immediately as shown by respondents immediately as respondents in table9 with (50%) by the respondents this meant that loss of information was not essay after the transaction was made.

4.4.4 To obtain information on how often the stock items are forecasted the respondents were asked whether the items ordered were forecasted and the following responses were obtained.

Table 10: How often items ordered are forecasted

Response	Frequency	Percentage (%)
Immediately	22	44
Daily	5	10
Weekly	17	34
Monthly	6	12
Total	50	100

Source: Primary data

Results in table 10 above show that items that are ordered and forecasted were ordered immediately as reflected in the table 10 above with (44%) indicating clear estimations in transactions.

4.4.5 To establish how often the organization carries out demand forecasting respondents asked whether demand forecasting is done often and following results were obtained.

Table 11: How often demand forecasting is done

Response	Frequency	Percentage (%)
Immediately	8	16
Daily	10	20
Weekly	18	36
Monthly	14	28
Total	50	100

Source: Primary data

Results in table 11 above show that demand forecasting is done weekly as shown in the table with 36 percent.

4.5 EFFECT OF TURNOVER PERFORMANCE ON INDEPENDENT VARIABLES

4.5.1 To establish the extent of change in turnover on inventory the respondents were asked whether the magnitude is bigger when there is change in turnover rate and the following responses were obtained.

Table 12: The extent of change in turnover on inventory

Response	Frequency	Percentage (%)
Large extent	24	48.0
Small extent	11	22
Moderately	12	24
Not at all	3	6.0
Total	50	100

Source: Primary data

The results in table 12 show that there were a greater change in inventory when the turnover rate changes, reflected in the above results by 48 percent from the respondents who say to a large extent.

CHAPTER FIVE
FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter presents findings, conclusions and recommendations of the study findings.

5.2 CONCLUSIONS

The major aim of the study was to establish the degree effectiveness of inventory monitoring and inventory information management on turnover performance to recommend interventions necessary to achieve optional turnover using Central Medical Stores as a case study.

In conclusion inventory monitoring and inventory information management indicated that they were directly influenced; turnover performance, but they were essential for demand forecasting system to achieve accurate results and timely forecasts. However, Central Medical Stores put less emphasis on information management functional gap which affected the accuracy of the demand forecasting input data.

The study further puts insight on high and steadily growing turnovers can be achieved if demand forecasts are efficient and timely Economic Order Quantities in line with customer demand cycles, therefore the decreasing demand forecasting time always yields increases in inventory turnover as long as Economic Order Quantities were accurate.
The results in this study further revealed that inventory information management and inventory monitoring affected turnover, setting of safety stock, reorder cycles and Economic Order Quantities based on demand cycles and information on demand data when monitored efficiently would help to achieve optimal turnover.

5.3 RECOMMENDATIONS

Inventory management practices are the key factor in ensuring continuous improvement in turnover growth. In this regard this recommended that distribution companies should carry out efficient inventory monitoring and operate good inventory information management system to ensure realistic inventory forecasts and high turnover.

Considering the importance of demand forecasting in achieving a good turnover, information that is required as input to demand forecasts must be consistent and based on customer needs. Therefore companies must strive to see that there is continuous monitoring of inventory, such that the decision rules that include safety stock, reorder points and EOQ on which forecasts are based are up to date and are based on historical data from past sales but also analyzed customer based information.

To minimize expertise, CMS should identify slow moving stock and damages, regular cycle counts should be carried out. This will reduce the cost of stock verification at the end of the accounting periods because it may no longer be necessary to close the company for long periods to handle stock reconciliations.
This research also recommends intervention particularly for CMS' optimization of its turnover. This include automation and instituting an automated customer relationship management (CRM) module to capture lost sales for accuracy of demand forecasting information.

Finally, the manipulation of information to find patterns is increasingly giving companies a competitive edge over the others. Therefore need to introduce decision support tools that will analyze customer relationship management information and use it to categorize products and services that will improve turnover.

5.4 SUGGESTED AREAS OF FURTHER STUDY

This research considered two inventory management practices variables namely inventory monitoring and inventory information management and their effect on turnover. The research did not quantify the effect these two variables have on turnover. Further research needs to be done to quantify this effect so that companies can easily simulate and extrapolate variances for each variable.

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