THE INFLUENCE OF STOCK CONTROL SYSTEMS ON ORGANIZATIONAL PERFORMANCE: A CASE OF TANZANIA PORTLAND CEMENT COMPANY

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A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION OF THE OPEN UNIVERSITY OF TANZANIA

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CERTIFICATION

The undersigned certifies that she has read and hereby recommends for acceptance by the Open University of Tanzania a dissertation titled "The Influence of Stock Control Systems on Organizational Performance: A Case of Tanzania Portland Cement Company" in partial fulfilment of the requirements for the degree of Master of Business Administration (MBA) of the Open University of Tanzania.

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DECLARATION

I, Farida Mzanva, do hereby declare that this dissertation titled; "The Influence of Stock Control Systems on Organizational Performance: A Case of Tanzania Portland Cement Company" is my original work and that it has not been presented and will not be presented to any other university for a similar or any other degree award.

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Farida Mzanva

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Date

DEDICATION

This dissertation is dedicated to my Lovely spouse Ibrahim Kwangaya, my beloved father and mother (Mr and Mrs Mnzava), my relatives Faraja Mnzava and Penina Mnzava for their endless support towards my success.

ACKNOWLEDGEMENT

The achievement of this study was a product of many individuals and institutions. I am highly indebted to the management of the Tanzania Portland Cement Company (TPCC) and their employees for allowing me to collect both secondary and primary data from their organization and also for their cooperation and support during data collection period.

Special appreciation goes to my supervisor, Dr. Hawa Uiso of the Open University of Tanzania for her technical guidance and tireless support during the entire period of writing this dissertation. Her inputs were and will remain valuable in developing scholarly works and other related documents. Lastly, I would like to express gratitude to my relatives and colleagues for their positive contribution in the accomplishment of this dissertation.

ABSTRACT

This study was carried out at Tanzania Portland Cement Company (TPCC) and the aim was to determine the influence of stock control systems on organizational performance. Specifically the study aimed at establishing the relationship between organizational performance on one hand and materials requirement planning, stock replenishment, distribution resource planning and vendor managed inventory on the other hand. Primary and secondary data were collected through questionnaires and desk research respectively and a sample of 132 respondents was used in filling the questionnaire. Data analysis was done using descriptive statistics and correlation and the findings of the study revealed that material requirements planning, continuous replenishment, distribution resource planning and vendor managed inventory had a positive significant effect on the performance of the company. The study recommends future studies to be conducted in other cement factories in the country.

Key words: stock control systems, organizational performance, stock and inventory.

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LIST OF ABBREVIATIONS AND ACRONYMS

CRS	Continuous Replenishment System
DRP	Distribution Resource Planning
ERP	Enterprise Resource Planning
JIT	Just-In-Time
MBA	Master of Business Administration
MRP	Materials Requirements Planning Systems
OUT	Open University of Tanzania
SPSS	Statistical Package for Social Sciences
TPCC	Tanzania Portland Cement Company
TOC	Theory of Constraints
VMI	Vendor Managed Inventory

CHAPTER ONE

1.0 INTRODUCTION

1.1 Overview

This chapter contains the background information, statement of the problem, objectives of the study, research questions, limitation and delimitation, the significance of the study and the organization of the proposal.

1.2 Background to the Research Problem

Stock management systems are of a great importance to business organizations. Mogere *et al.,* (2013) indicated that inventory control systems have an important role in improving inventory management of organisations. Business firms have been constantly searching for the basis of efficiency and effectiveness of their stock management systems so as to develop their competence (Rajeev, 2008). In an ideal world resources move easily and constantly throughout the supply chain. Practically, impediments are inevitable and when resources cease to move they form inventory. This is to say all organizations hold stocks of some kind (Waters, 2003).

Stock control is essential for a successful organization. It is also very important in the management of materials and commodities that have to be stored for future use in the production processes or for future exchange by service providers. The main objective of inventory control involves balancing situation between holding too much or too little stock. The problem of having too large or too little stock quantities is the source of unsuccessful organization (Kumar and Bahl, 2014). According to Koumanakos (2008), the scholastic literatures on stock focus on manufacturing and procurement as the key determinants of company's stock policy and control.

In developing countries particularly Tanzania inventory management has been a great challenge to the extent that poor inventory control in 1990 led Urafiki Textile Mills Company Limited to fail in its operations, consequently privatizing the company to the Chinese supervision through joint venture (Mwansele, 2011). Kagashe and Massawe (2012) explained that drug shortages and stock control problems in Tanzanian public hospital has been associated with poor levels of logistic skills and lack of funds to procure medicines required. Medard (2013) found that inventory management in Parastatal organizations improved as the government struggled to make sure that qualified and competent professionals knowledgeable in computerized inventory system were employed and were well remunerated.

TPCC annual report (2013) explained inventory control as a process that involved costs incurred in bringing each product to its present location and condition. This included purchase cost on " first in first out" basis for raw materials. In the case of finished goods and work in progress the cost of direct materials and labor and the proportion of manufacturing overheads was based on normal capacity. Despite of the company's expansion the stock management was of good quality so as to satisfy customers by providing them with high quality products and services at an affordable price. TPCC has worked hard to increase its operational excellence, reduce production cost, while maintaining a leadership position in the Tanzanian market.

Efiok *et al.,* (2015) found that with the exception of the huge manufacturing firms, the majority of the medium-sized flour manufacturing firms in Nigeria base their stock control plans and policies on issues such as varying levels of buyer demand,

current manufacturing practices, predicted approximation and assumptions, and the available manufacturing ability of the production facilities. Most of the manufacturing firms were either not aware of the current inventory systems or were not prepared to implement them as a guide to their stock control practices.

Lwiki *et al.*, (2013) indicated that the functioning of sugar manufacturing companies in Kenya was highly influenced by their inventory control practices. The precise performance indicators were based on the level of inventory control practices. Stock is the most significant element of any organization particularly for manufacturing firms. Inventory control increases customer satisfaction through short lead times hence manufacturing firms must set up the most favourable stock control methods or develop as much as possible their asset turnover (Shardeo, 2015).

Successful stock management is capable of making a considerable input to company's revenue as well as enhancing its earnings on total assets (Kumar and Bahl, 2014). To some extent, literatures have depicted the effectiveness of optimizing inadequate company resources and reducing costs linked to them (Rajeev, 2010). To the researcher's knowledge, few studies if any have been conducted on the extent to which the stock control systems affect the efficient performance of manufacturing organizations in Tanzania. For that reason, this study examined the influence of stock control systems on organizational performance.

1.3 Statement of the Research Problem

Inventory control becomes more difficult with the increase in stock items, sales volume and expansion of product varieties. The cost of handling inventory, extensive creation of manufactured goods and the threat of obsolescence make the expense of

holding huge stocks very high (Graman, 2006). In addition, items that are highly demanded have safety stock allocated to them but in majority of firms there are a lot of lowly demanded items that maintaining any stock of these items is irrationally costly. Therefore companies ought to provide high-quality service at the same time upholding minimal stock (ibid, 2006). Effective inventory control in organizations is one of the essential success features. The challenge in controlling stock for many organizations is balancing between inventory supply and demand (Rajeev, 2008). Therefore, inventory control systems are essential aspects of any organization.

Organizations including public and private suffer a great challenge in controlling their inventories. Uncontrolled inventory results in inadequate stock, huge stock than is necessary and large stock expenses (Medard, 2013). Stock control systems facilitate firms to find out and sustain an optimal intensity of savings in inventory so as to attain the required organizational performance. In order for the organizations to control stock efficiently they need to make use of proper stock control techniques that help to eliminate excess inventories as well as ensuring the right amount of inventory is available when needed.

Kumar and Bahl (2014) claimed that a lot of attention needs to be paid to inventory management because stock is the largest item that appears on the balance sheet. Mathuva (2013) uttered that for a long period of time the trend of the association between stock control systems and firms' organizational performance has not been understandable. Gill *et al*., (2010) as cited by Mogere *et al.,* (2013) expressed that preceding studies on the association between inventory management systems and organizations' functioning had depicted diverse results. Above all only few studies

concerning stock control have been conducted in Tanzania. Hence the focus of the current study on the influence of stock control systems on the organizational performance of Tanzania Portland Cement Company was timely.

1.4 Objectives of the Study

1.4.1 General Objective

The main objective was to determine the influence of stock control systems on organizational performance, with particular focus on Tanzania Portland Cement Company.

1.4.2 Specific Objectives

The specific objectives of the study were;

i. To establish the relationship between material requirements planning and organizational performance.

ii. To determine the relationship between continuous replenishment and the company's performance.

iii. To determine the relationship between distribution resource planning and organizational performance.

iv. To determine the association between vendors' managed inventory and organizational performance.

1.5 Research Questions

From the above specific objectives, the following research questions were established;

i. What is relationship between material requirements planning and organizational performance?

ii. What is the relationship between continuous replenishment and the company's performance?

iii. What is the relationship between distribution resource planning and organizational performance?

iv. What is the association between vendors' managed inventory and organizational performance?

1.6 Significance of the Study

This study is a prerequisite for the accomplishment of the Degree of Master of Business Administration (MBA) of the Open University of Tanzania (OUT). The findings of the study will be of use to various stakeholders who are affected by the stock control of Tanzania Portland Cement Company in one way or another. The recommendations provided can be used by Tanzania Portland Cement Company for managing its stock. Academically the study will serve as avenue for future studies by contributing knowledge on stock control in business organizations.

1.7 Limitation of the Study and Delimitation

Given the nature of the information required most of the organizations were reluctant to provide the data required. But fortunately the Tanzania Portland Cement Company came into rescue by accepting the research clearance letter from the Open University of Tanzania.

1.8 Organization of the Research

The dissertation is organised into five chapters. Chapter one provides introduction to the study. It covers background information, statement of the problem, objectives,

research questions and significance of the study. Limitation of the study and delimitation and finally organization of the research are also found in the first chapter. Theoretical and empirical literature reviews are addressed in chapter two together with the definition of basic concepts, research gap and conceptual framework.

The third chapter expresses the methodology used by the study including the research philosophy, design, study area, population and sampling techniques. Similarly, data analysis and interpretation, variables and measurements, data validity and reliability and finally ethical issues are all covered in this chapter. The fourth Chapter provides research findings and discussion on the findings followed by chapter five which covers conclusions, recommendations and avenues for future studies.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Overview

This chapter includes definition of basic terms used in the study; theories supporting the study, empirical literature review and research gap, finally the conceptual and theoretical framework are depicted.

2.2 Definition of Basic Terms

Two basic concepts will be used throughout the study including Stock control systems and organizational performance. A stock control system is a system that covers all features of controlling company's stock which includes buying, transporting, receiving, trailing, storing, earnings, and reordering (Encyclopaedia, 2016). For the purpose of this study, stock control systems are techniques involved in managing and optimizing the amount of stock in the organization. Organizational performance is the degree to which an organization is successful in achieving its objectives (effectiveness) using the lowest amount of resources (efficiency) (Gavrea *et al.,* 2011). Performance in this study means the output or results attained by the organization in relation to the use of proper stock control systems. The indicators of performance were profitability level, production level, sales volume, competitive gain, cost reduction and operational improvement.

2.3 Theoretical Literature Review

Theory of constraints (Goldratt 1984): The theory of constraints (TOC) is a management viewpoint that seeks out to enhance manufacturing output effectiveness or system functioning evaluated by sales through the recognition of those activities

that are limiting the manufacturing system. Moore and Scheinkopf (1998) claimed that the theory of constraint visualizes organizations as systems comprising of resources, which are connected by the processes they execute. The objective of the firm serves as the principal evaluator of success. Inside that system, a limit/constraint is described as anything that restricts the system from attaining a superior performance in relation to its purpose. Umble *et al.*, (2006) as cited by Mogere *et al.,* (2013) claimed that performance dimensions are focused on the philosophy of input items, number of days goods stay as inventory and operation costs.

The complications in the TOC includes: extended lead times, huge amount of discontented orders or execution of orders with an additional effort. Additional difficulties include: large number of unnecessary stocks or deficiency of relevant stocks, incorrect resource orders, huge number of urgent orders, high levels of decentralization, deficiency of key customers commitment, regular changes or lack of control in relation to prioritized orders, which entails schedule divergence of the materials (Goldratt, 2004).

The theory of constraints offers an explicit methodology for recognizing and eradicating the constraints, known as the Five Focusing Steps. This includes; identification of the constraints, exploiting the constraints, subordination and synchronization of the constraint, elevation of the performance of the constraint and finally repeating the process (Vorne, 2011). The theory of constraints is encountered with some criticisms. These include; the thought that Goldratt himself considers the theory as an item for sale, thus acts as a salesman. In addition, some people utter that

the theory borrows concepts and ideas from earlier theories and studies; however Goldratt has not acknowledged these inputs to his theory (Wilkinson, 2013).

Lean manufacturing philosophy and the theory of constraints: Lean is a technique that advances processes all the way through continuous improvement (kaizen) and elimination of waste (Lean manufacturing junction, 2008). The main consideration of lean manufacturing is in fact eradicating waste from the manufacturing process. Waste is described as any activity that does not add worth from the customer's viewpoint. A study carried out by the Lean Enterprise Research Centre (LERC), revealed that entirely 60% of production processes in a typical manufacturing operation are waste (Vorne, 2011).

Lean philosophy directs its practitioners to develop their companies by aiming at the removal of all waste. Both philosophies (TOC and Lean manufacturing) focus on enhancement and promote methods to manage the flow of material. Both have established remarkable results of functioning. Some of the benefits are; rapid increase in profitability, slashing of lead times and inventories and also, simplified operations (Moore and Scheinkopf, 1998). In addition, Moore and Scheinkopf (1998) claimed that both actions identify that in order to attain and maintain such benefits, the change perspectives ought to go beyond the limits of manufacturing to incorporate the entire organization.

In reality, the mechanisms of TOC and Lean manufacturing are mostly in agreement therefore both of them can survive in an organisation. Moreover, the Theory of constraint and Lean manufacturing enlarged their scope to cover practices and

principles of the whole system to facilitate continuous improvement (Moore and Scheinkopf, 1998).

2.4 Empirical Literature Review

Mogere *et al.,* (2013), claimed that tea processors in Kenya encountered difficulties of varying stocks, incorrect predictions and low consumption of inventories caused by deficient synchronization of operations. The literature that exists signifies that not all stock control systems were essentially excellent for employing in given firms. The outcome of the study revealed that there is a significant relationship between the utilization of inventory control systems and the tea processing firm's operational performance. Kumar and Bahl (2014) found out that Amtek Auto Limited was holding large inventories because it did not apply EOQ.

Efiok *et al.,* (2015) studied the inventory management practises of flour manufacturing firms in Nigeria by examining the consequences of the recognized inventory management techniques on operational performance. It was concluded that there exists a significant association between inventory management practices and operational efficiency. Lwiki *et al.,* (2013) examined on the connection between the inventory management practices and firm's financial performance of sugar manufacturers in Kenya, by examining the degree to which lean inventory system, strategic supplier partnership and technology are being practised in these firms.

The findings indicated that there is a positive relationship between inventory management and return on sales and also return on equity. Musara (2012) as cited by Medard (2013) carried out a study and revealed that the majority of organizations are

not using Just in Time (JIT) inventory management principles, and that there exists difficulties that obstruct the functioning of Just in Time (JIT) philosophy in organizations. Some of the difficulties include; lack of reliable supplier connections, inadequate capital and insufficient knowledge of instant financial benefit. The results of the study indicated that there was a significant positive relationship between the use of JIT inventory system and cost efficiency, quality and flexibility.

Table 2.1: A Summary of Empirical Literature Review

Author	Title	Methodology	Findings
Mogere *et al.,* (2013)	Effect of inventory control systems on operational performance (Kenya).	Descriptive statistics, inferential statistics and regression analysis	significant positive relationship between the application of inventory control systems and the firm's operational performance
Efiok *et al.,* (2015)	Inventory management practices and operational performance of flour milling firms in Lagos (Nigeria).	Correlation and regression analysis	Positive correlation between inventory management practices and operational performance
Lwiki *et al.*, (2013)	The impact of management practises on financial performance of sugar manufacturing firms in Kenya.	Descriptive statistics and correlation analysis	Positive relationship between inventory management and return on sales, also with return on equity
Musara (2012)	Impact of just in time (JIT) inventory system on efficiency, quality and flexibility among manufacturing sector, small and medium enterprises in South Africa.	Descriptive statistic and correlation analysis	Positive relationship between the use of JIT inventory system and cost efficiency, quality and flexibility
Kumar and Bahl (2014)	The effect of inventory management on organizational performance (India).	Variance analysis, Economic Order Quantity(EOQ) Model and Chi-square method	For the company to reduce its inventory and inventory cost it has to apply the EOQ model.

Source: Empirical literature review

Mwansele *et al.,* (2011) based on their study on determining Inventory Control Policies employed at Urafiki Textile Mills, concluded that the company require a suitable inventory system to reduce running costs. If the EOQ model was objectively utilized, with the help of some opinions by the management, the total storage costs and ordering costs would be minimized. Kagashe *et al.,* (2012) examined the shortage of medicines and inventory management problems in Tanzanian public hospitals. The study concluded that the employees involved in supplying of medicine had poor level of logistic skills. In addition, insufficient funds to procure the drugs were one of the main reasons that resulted to drugs stock outs.

2.5 Research gap

From the literature review it was realized that few studies have been done in Tanzania as far as stock control is concerned. In addition, many researchers who studied on inventory took their case studies on food manufacturing sector while this study focused on cement manufacturing company. Therefore the study was conducted so as to gain a clear picture on the current stock control situation along with the contribution of stock control systems to the performance of an organization.

2.6 Conceptual Framework

| Stock Control Systems
Material requirements planning
Continuous replenishment
Distribution resource planning
Vendor managed inventory | → | Organizational Performance
Increased profitability
Productivity
Competitive gain
Increased sales
Cost reduction
Operational improvement |
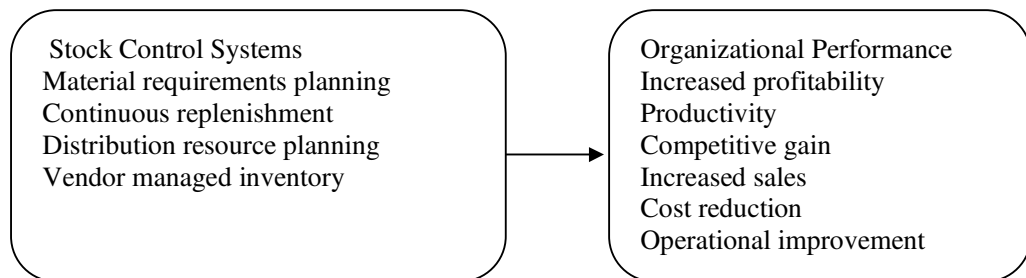
Figure 2.1: Conceptual Framework

Source: Authors' literature review

2.7 Theoretical Framework

Measurements in the Theory of Constraints (TOC) are focused on a straightforward relationship that gives emphasis to the influence of stock control systems on upgrading the organizational performance. The proof of efficiency for any stock control system is the extent to which it develops performance of the companies. For business firms to guarantee that the limitations on their activities run smoothly they have to embrace the utilization of stock control systems that can facilitate operational competence. In addition, for the firms to progress performance especially through minimizing excess stock, Lean manufacturing techniques should be adhered.

2.7.1 Dependent Variable

This study involved organizational performance as the dependent variable. This variable had the following indicators: profitability level, production level, operational improvement, competitive gain, sales volume and cost reduction.

2.7.2 Independent Variable

In this study the independent variable was stock control systems used in the company which included: material requirements planning, distribution resource planning, vendor managed inventory and continuous replenishment. Furthermore each measure of the independent variable had its specific indicators. Material requirements' planning was measured by supply reliability, decreasing of idle time and smooth flow of information. The measurements for continuous replenishment were reduced level of stock, timely stock replenishment and reduced rate of ordering. Distribution resource planning was specified by the shortening of order processing time, efficiency in forecasting and superior customer service delivery.

Vendor managed inventory was measured by flexibility to respond, timely delivery of items and monitoring the minimum level of stock.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Overview

This chapter covers the methods for conducting the research. It covers research philosophy; research design; research area; target population, sample size and sampling techniques; types of data collected, research instruments; data analysis; validity and reliability of the research instrument and ethical considerations.

3.2 Research Philosophy

Research philosophy is simply a belief in relation to the means to which information on an observable fact should be collected, analysed and utilized. According to Saunders *et al.,* (2009) research philosophy is a term that relates to the development of knowledge and the nature of that knowledge. This study was based on the positivism philosophy .Positivism involves working with an observable social reality and that the end product of such research can be law-like generalizations similar to those produced by the physical and natural scientists (Saunders *et al.,* 2009).

This study involved the use of an existing theory to develop research questions and testing them in an objective way using statistics. Positivism is mostly adopted by quantitative studies whereby questionnaires are used as a tool to obtain data. With this philosophy it was easy to validate results through statistics. Another important component of the positivist approach to this study is that the research was undertaken, as far as possible, in a value-free way. This approach aims to exclude a researcher's own values when conducting research. Hence, the researcher becomes

independent of and neither affects nor is affected by the subject of the study.

3.3 Research Design

Research design can be described as an arrangement of circumstances for gathering and analysing of data in a way that aims to merge significance to the research purpose (Kothari, 2004). In general, the study adopted a cross sectional descriptive research design which involved a quantitative approach in gathering and analysing data. The study adopted a case study research design in order to gain detailed information on the variables hence understand more the relationship between them.

3.4 Research Area

The study was conducted at Tanzania Portland Cement Company to represent companies operating in Tanzania. The company is located at Dar es Salaam and it is one of the companies operated by the Heidelberg cement group. It manufactures cement and clinker. The company maintains it leadership position in the market (TPCC annual report, 2013). According to TPCC annual report (2011) the company is the most aged cement company as it has been operating since independence till to date .Therefore the performance of the company attracted me to pick it as my case study. The estimated population at this area was 200 employees working at the plant.

3.5 Sampling Design and Procedures

According to Kothari (2004) sampling design is simply planning on how to acquire a sample size from a certain population. The sample size of 132 employees from the population of 200 employees was established from sample size table (Appendix II).

Table 3.1: Sample Size

Departments	Sample Size
Administration	22
Procurement and stores	20
Operations	30
Maintenance	30
Packaging	5
Other departments	25
Total	132

Source: Researcher (2016).

3.5.1 Sampling Procedure

Purposive or judgmental sampling enables a researcher to make use of judgement in selecting cases that will be best in answering the research enquiry(s) and to meeting the intended purposes (Saunders *et al.,* 2009). In addition, Neuman (2005) claimed that this type of sampling is frequently utilized when dealing with extremely small samples, for example in a case study research or when the researcher wishes to choose cases that are mostly informative. Therefore the sample was selected using purposive sampling so as to ensure that information was obtained from the precise people who facilitated in bringing up valuable data which were suitable and dependable when tested in similar conditions.

3.6 Variables and Measurement Procedures

The conceptual framework of this study consisted of stock control systems as the independent variable whereas organizational performance was the dependent variable. The indicators for Stock control systems were material requirements planning, continuous replenishment, distribution resource planning and vendor managed inventory while organizational performance was measured by profitability level, production level, operational improvement, competitive gain, sales volume and

cost reduction. In addition each indicator of the independent variable had its specific measurements as it is seen in table 3.2.

Table 3.2: Stock Control Systems and Their Indicators

Material Requirements' Planning	• Supply reliability • Decreasing of idle time • Smooth flow of information
Continuous Replenishment	• Reduced level of stock • Timely stock replenishment • Reduced rate of ordering
Distribution Resource Planning	• Shortening order processing time • Efficiency in forecasting • Superior customer service delivery
Vendor Managed Inventory	• Flexibility to respond • Timely delivery of items • Monitoring the minimum level of stock.

Source: Researcher (2016).

3.7 Methods of Data Collection

Data was gathered from the field basically through the following methods: a structured questionnaire and observation for primary data collection. As for secondary data the researcher reviewed various documents relating to the topic understudy such as journals, articles, books, TPCC reports, organizational documents and information downloaded from the internet.

3.7.1 Questionnaire

A questionnaire can generally be defined as an instrument with which everyone is inquired to respond to the similar batch of questions in a specific way. For the case

of this research a structured questionnaire was utilized to gather data from TPCC employees.

3.7.2 Observation

Through the observation technique, the information is gathered by means of investigator's own straight observation without questioning the respondent. The major benefit of this technique is that personal bias is eradicated, if watching is done precisely (Kothari, 2004). Observation included nature of stock items, activities done by procurement and stores departments, the application of stock control systems, production and packaging processes. This process was done so as to compensate information not obtained through the questionnaire.

3.7.3 Documentary Review

Documentary review was done for secondary data collection. Secondary data simply mean data that are already existing meaning that data which have previously been gathered and analyzed by other people (Kothari, 2004). Documents reviewed included journals, internet sources, company's annual report, books and articles. Various websites were accessed including Emerald, Google scholar, ScienceDirect.com and Taylor and Francis. The search key words used alone or in combination included inventory control, inventory management, stock control, EOQ, TPCC, stock out, and organizational performance.

3.8 Reliability and Validity of the Research Instrument

Reliability: Reliability refers to the capability of an instrument to generate reliable and stable measures. A dependable measurement will constantly allocate similar

score to the similar phenomena (Mathiasa and Owuor, 2015). Reliability was measured using Cronbach's alpha that approximates the internal uniformity based on the average inter - item correlation. Table 3.3 elaborates more on the interpretation of the cronbach's alpha whereby the closer the result is to one the more reliable it becomes.

Table 3.3: Cronbach's Alpha Description

S/N	Cronbach's alpha	Internal consistency
1	$\alpha \geq 0.9$	Excellent
2	$0.7 \leq \alpha < 0.9$	Good
3	$0.6 \leq \alpha < 0.7$	Acceptable
4	$0.5 \leq \alpha < 0.6$	Poor
5	$\alpha < 0.5$	Unacceptable

Source: George and Mallery (2003).

Validity: Validity refers to the capability of an instrument to evaluate what it is supposed to evaluate. For the case of this study the researcher discussed the research instrument with experts in the field (content validity) thereafter a pilot test was conducted. This was done to check whether the questions constructed would provide the required information.

3.8 Data Analysis

Kothari (2004) claimed that collected data has to be processed and analyzed at the time of planning the research, according to the guideline proposed. He added by saying that, the processing entails editing, coding, categorization and tabulation of gathered information so that they are agreeable to analysis. Data was analyzed using descriptive statistics (mean and standard deviation) and correlation analysis (Karl

Pearson's coefficient of correlation) with the aid of statistical package for social sciences (version 23). Descriptive statistics was used for initial data analysis thereafter correlation analysis was applied so as to determine the relationship between the dependent and independent variables. In addition reliability analysis (cronbach's alpha) was done to check the relationship between measurements of each recognized variable.

3.9 Ethical Consideration

The ethical issues considered when conducting this study were: informed consent of the participants, voluntarily participation and privacy of possible and actual participants. Moreover, the respondents were well-informed that data gathered was only intended for academic purposes, and that maintenance of the confidentiality and anonymity of the provided data will be observed. Last but not least, information sources and materials were accredited and a letter of research clearance was obtained from the Directorate of Postgraduate Studies.

CHAPTER FOUR

4.0 FINDINGS AND DISCUSSION

4.1 Chapter Overview

This chapter reports on the basic profile of respondents and summarised the findings of the study and discussion in relation to the study objectives.

4.2 Response Rate

A response rate is an association between the people who have taken part in the research and the people in the sample size expressed in percentage. The study targeted 132 employees from different departments. Out of 132 questionnaires distributed for data gathering from the respondents 102 (77.3%) were returned. Mugenda and Mugenda (1999) expressed that a response rate above 50% is sufficient for analysis whereas 70% and above is regarded as very good. The study obtained a 77.3% response rate.

4.3 Basic Profile of Respondents

4.3.1 Respondents' Gender

Table 4.1 on addressing basic profile of respondents' shows that a quarter of the sample is constituted by women and the rest are men. The smaller number of women in the population on the other hand is a feature common to most manufacturing firms due to the nature of work done. This is because most of manufacturing firms require twenty four hours and seven days a week of operations.

4.3.2 Departments of the Respondents

The researcher required departments which were more concerned and knowledgeable with the stock and operations of the company. Table 4.1 indicates

that three departments were more concerned with inventory and operations of the company and reported valid percentages above 20. The figures show that larger percent of the respondents had knowledge on stock control and operations of the company. In addition, it was observed that the stores and procurement personnel were few, they were twenty all together. This made the researcher to take more respondents from other departments, but who seemed to be aware of stock control issues and organizational performance.

Table 4.1: Basic Profile of Respondents

Variable	Variable category	Frequency	Percentage
Sex			
	Male	75	74.3
	Female	26	25.7
Department			
	Administration	12	12.1
	Procurement and stores	20	20.2
	Operations	27	27.3
	Maintenance	27	27.3
	Packaging	1	1.0
	Any other	12	12.1
Length of service			
	Less than 1 year	26	25.7
	1-5 years	29	28.7
	More than five years	46	45.5

Source: Researcher (2016).

4.3.3 Respondents Length of Service

Findings revealed that a quarter of the respondents had a working experience of less than one year while the rest had worked for more than one year with the organization. This implies that a larger percent of the respondents had an exposure to operations of the company. For that case they were in a position to reveal about the influence of stock control systems on organizational performance.

4.4 Nature of Inventory Items

The items to which stock control systems were applied in the company are depicted in table 4.1. Where by the results shows that stock control systems were most applicable to raw materials and stores items. In addition, the researcher observed that the levels of final product (cement) were not controlled by the stores and procurement department instead they were under operations department. Table 4.2 depicts that 93.9% of the respondents were aware of the fact that final products (cement) were not considered as inventory due to their nature. The study also revealed that for the final product (cement) to maintain its quality it was not kept as a stock item in the warehouse.

In addition the researcher also observed that there was a large main store well equipped with quality stock items, and other large storage areas. The amount, layout, quality and management of stock observed were indeed a competitive advantage to the organization. But due to the expansion of the company in 2008 (TPCC annual report, 2008), demand for stock items has also increased. As a result the main store had inadequate storage space leading to some items being kept outside the store.

Table 4.2: Nature of Inventory Items

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	raw materials	40	39.2	40.8	40.8
	final products	6	5.9	6.1	46.9
	stores	52	51.0	53.1	100.0
	Total	98	96.1	100.0	
Missing	99	4	3.9		
Total		102	100.0		

Source: Researcher (2016).

4.5 Results of Reliability and Validity Measures of the Research Instrument

Validity of the study: Validity of the study was measured through a pilot test and content validity. The researcher consulted with experts in the field to refine the measures and to ensure that every aspect was covered. Thereafter the questionnaires were pretested to eight employees to establish their validity. The response revealed that all questions were clear and understandable.

Reliability of the Study: The Cronbach's Alpha scale reliability test revealed an outcome of 0.822 for the 18 research questions in the questionnaire as in Table 4.3. This was a good reliability since the higher the figure the higher the internal consistency of items to be analysed. Therefore the research instrument was very much reliable and acceptable for analysis since the Cronbach's Alpha coefficient was closer to 1as it was described in Table 3.3.

Table 4.3: Reliability Statistics

Cronbach's Alpha	N of Items/Questions
.822	18

Source: Researcher (2016).

4.6 Findings, Analysis and Discussion for Each Research Specific Objective

The study mainly intended to determine the influence of stock control systems on organizational performance. The findings based on each specific objective are analysed and discussed as follows:

4.6.1.1 Findings and Analyses of Data from First Specific Objective

To establish the relationship of material requirement planning and organizational performance. Material requirement planning was described using three

measurements (Table 4.4). These included; supply reliability, decreasing of idle production time and smooth flow of information. The mean score for the three items were above average as shown in table 4.4. It should be noted the mean values ranged from one which equalled to strongly disagree to five which equalled to strongly agree. Standard deviation ranged from 0.75 to 1.04 this implied that there was less dispersion among respondents since they almost gave similar views on supply reliability, decreasing of idle time and smooth flow of information.

Table 4.4: Descriptive Statistics on Material Requirements Planning

	N	Minimum	Maximum	Mean	Std. Deviation
Supply Reliability	100	1	5	4.04	1.044
Decreasing of Idle Time	101	1	5	4.23	.904
Smooth Flow of Information	101	1	5	4.41	.751
Valid N (Listwise)	100				

Source: Researcher (2016).

From the results it is obvious that material requirements planning through its measurements had a great influence on operational activities of the company, since the mean and standard deviation figures obtained depict that most of the people agreed with the statements. Above all efficiency in information flow had greater influence on operations of the company than the other indicators.

According to Saunders *et al.,* (2009) correlation analysis facilitates the process of quantifying the intensity of the linear relationship between two variables. The value obtained (usually symbolized by the letter r) ranged between negative one and positive one. A value of positive one signified a perfect positive correlation meaning both variables were exactly associated. Distinctively, a value of negative one

denoted a perfect negative correlation meaning that both variables are accurately connected.

Correlation values between positive one and negative one represented strong and weaker positive and negative correlations. The findings from table 4.5 revealed that material requirements' planning was significantly related to the company's performance. The findings depict that there was a positive significant relationship between the two variables (r=0.398, p<0.01) though it was not strong.

Table 4.5: Pearson Correlations Between MRP and Organizational Performance

		Material Requirements Planning	Organizational Performance
Material Requirements Planning	Pearson Correlation	1	.398[**]
	Sig. (2-Tailed)		.000
	N	100	97
Organizational Performance	Pearson Correlation	.398[**]	1
	Sig. (2-Tailed)	.000	
	N	97	98

**. Correlation is significant at the 0.01 Level (2-Tailed).
Source: Researcher (2016)

4.6.1.2 Discussion of Findings from the First Specific Objective

The findings revealed that there was a relationship between material requirements planning and organizational performance. It was evident that supply reliability, decreasing of idle time and smooth flow of information affects the company's operations. According to Waters (2003), Material requirements planning make use of the master schedule, alongside other significant information, to plan the supply of resources. MRP avoids inventory costs by matching the supply of resources directly to demand. For this reason MRP develops the greater performance of the firm

measured through equipment consumption, production, customer service, replying to market situations, and the like.

4.6.1.2 Findings and Analyses of Data from Second Specific Objective

The second objective was to determine the relationship between continuous replenishment and organizational performance. Table 4.6 depicts the average and standard deviation of this variable. The mean ranged from 3.62 to 3.92 which indicated that the relationship was relatively lower than it was in material requirements planning. The findings indicate that continuous replenishment was related to organizational performance although the relationship was not so large. Reduced level of stock have the highest Standard deviation score of 1.214 which indicated that it was an issue of concern. However, the mean and standard deviation showed that there was a significant association among the variables. Table 4.6 also depicts that timely stock replenishment had a greater influence on the company's operations.

Table 4.6: Descriptive Statistics on Continuous Replenishment

	N	Minimum	Maximum	Mean	Std. Deviation
Reduced Level Of Stock	98	1	5	3.62	1.214
Timely Stock Replenishment	100	1	5	3.92	.939
Reduced Rate Of Ordering	99	1	5	3.84	1.017
Valid N (listwise)	93				

Source: Field survey (2016).

The relation that continuous replenishment had on organizational performance was further analysed through the correlation between both variables. In table 4.7 the findings depicts (r = 0.353, p<0.01), that meant a positive significant relationship between the two although the relationship was not strong. Hence it was evident that

continuous replenishment was related to organizational performance.

Table 4.7: Pearson Correlation between CRS and Organizational Performance

		Continuous Replenishment	Organizational Performance
Continuous Replenishment	Pearson Correlation	1	.353[**]
	Sig. (2-tailed)		.001
	N	93	91
Organizational Performance	Pearson Correlation	.353[**]	1
	Sig. (2-tailed)	.001	
	N	91	98

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Researcher (2016)

4.6.1.3 Discussion of Findings from the Second Specific Objective

The findings revealed that continuous replenishment had an impact on organizational performance. It was evident that in manufacturing companies reduced level of stock, timely stock replenishment and reduced rate of ordering influenced the operational activities. The intention of continuous replenishment was to build up free flowing order execution and delivery systems, so that the stock level could be considerably minimized (Baily *et al.*, 2008) as cited by (Mogere *et al.*, 2013).These findings concur with the findings of Efiok *et al.*, (2015) about the influence of inventory control practices on operational performance of flour manufacturing firms. Their results revealed that automatic replenishment practice among other inventory management practices had a correlation coefficient of 0.432, significant at the 0.01 level in relation to organizational performance.

4.6.3.1 Findings and Analysis of Data from Third Specific Objective

The third objective was to determine the relationship between distribution resource planning and organizational performance. Table 4.8 shows that the mean score was above average meaning that most of the respondents agreed with the fact that distribution resource planning had an influence on organizational performance. Above all superior customer service delivery had more impact on operations of the company since it had a higher mean. The statistics depicted that the smallest standard deviation was associated with superior customer service delivery whereas the highest standard deviation was associated with shortening the order processing time efficiency in forecasting. This indicated that there was a lower dispersion among the respondents, and that they had similar opinions concerning the dimensions on distribution resource planning.

Table 4.8: Descriptive Statistics on Distribution Resource Planning

	N	Minimum	Maximum	Mean	Std. Deviation
Shortening The Order Processing Time	98	1	5	3.78	1.070
Efficiency in Forecasting	102	1	5	4.17	.868
Superior Customer Service Delivery	101	2	5	4.34	.725
Valid N (listwise)	98				

Source: Field survey (2016).

The relationship between distribution resource planning and organizational performance was further analysed through correlation analysis. Table 4.9 indicated a correlation coefficient above 0.5 significant at the 0.01 level. This meant a positive

significant relationship between both variables. According to Kothari (2003), Positive figures of r signify a positive correlation between the two variables. Also, the closer the value of 'r' is to positive one or negative one the stronger the relationship between both variables.

Table 4.9: Correlation Between DRP And Organizational Performance

		Distribution Resource Planning	Organizational Performance
Distribution Resource Planning	Pearson Correlation	1	.644**
	Sig. (2-tailed)		.000
	N	98	95
Organizational Performance	Pearson Correlation	.644**	1
	Sig. (2-tailed)	.000	
	N	95	98

**. Correlation is significant at the 0.01 level (2-tailed).
Source: Researcher (2016).

4.6.3.2 Discussion of Findings from the Third Specific Objective

These findings showed that there was a significant connection between distribution resource planning and the company's performance. Farrington and Lysons (2006) described Distribution Resource Planning as a system for anticipating or forecasting requirements for final products at the time of demand. Moreover Quesada *et al.,* (2012) expressed that precise demand and sales estimates aids a business firm to avoid stock-out circumstances and facilitates the firm to offer great customer service.

The main objective of this stock control system was to smooth the progress of accurate forecasting of consumer demand and thus appropriate response to their wants. Farrington and Lysons (2006) add that DRP gives the starting point to

incorporate the production planning and control system from the business firm to the field. Similarly, shortening the order processing time, efficiency in forecasting and superior customer service delivery were important factors to be considered so as to manage well the company's inventory.

4.6.4.1 Findings and Analyses of Data Specific Objective Four

The final objective was to determine the association between vendors' managed inventory and organizational performance. Table 4.10 shows the measurement of vendor managed inventory with mean above average which depicts that the mean scores were closer to 5. On the other hand, standard deviation ranged from 0.68 to 0.94 which indicated that there was no much variation in terms of standard deviation. These results proved that most of the people agreed with the statements. Above all timely delivery of items to the company had a greater effect on operations of the company.

Table 4.10: Descriptive Statistics on Vendor Managed Inventory

	N	Minimum	Maximum	Mean	Std. Deviation
Flexibility To Respond	99	2	5	4.08	.680
Timely Delivery	99	1	5	4.20	.782
Monitoring The Minimum Level Of Stock	100	1	5	4.06	.941
Valid N (listwise)	94				

Source: Field survey (2016).

The association between vendor managed inventory and organizational performance

was further analysed through correlation analysis. From table 4.11 a correlation coefficient of 0.521, significant at the 0.01 level was obtained. This indicated that there was a medium positive significant relationship between vendors' managed inventory and organizational performance.

Table 4.11: Correlation between VMI and Organizational Performance

		Vendor Managed Inventory	Organizational Performance
Vendor Managed Inventory	Pearson Correlation	1	.521**
	Sig. (2-tailed)		.000
	N	94	91
Organizational Performance	Pearson Correlation	.521**	1
	Sig. (2-tailed)	.000	
	N	91	98

**. Correlation is significant at the 0.01 level (2-tailed).
 Source: Researcher (2016).

4.6.4.2 Discussion of Findings from Specific Objective Four

These findings therefore showed that there existed an association between vendors'

managed inventory and the company's performance. Most of the respondents agreed

with the statements in the questionnaire as it is depicted in table 4.10. Vendor

managed inventory involved the items/ inventory managed directly by the supplier.

Inventory is replenished based on the usage or regular intervals by the vendor.

These findings coincide with the findings of Efiok *et al.*, (2015) about the

relationship between Inventory management practices and operational performance

of flour manufacturing firms. Their results revealed that Vendor Managed inventory

practice among other inventory management practices had a correlation coefficient

of 0.521, significant at the 0.01 level in relation to organizational performance.

4.7 The Influence of Stock Control Systems on Organizational Performance

In general from the findings it was revealed that stock control systems had a positive

influence on organizational performance. Which means that for a firm to succeed in

today's business world it should adhere to appropriate stock control systems. Table

4.12 shows mean and standard deviation of organizational performance in relation to

the use of stock control systems. Most of the mean scores were above 4 with

exception of sales volume.

This indicated that most of the individuals agreed that organizational performance was influenced by stock control systems. The lower mean score on sales volume indicated that variation in sales in not necessarily contributed by efficiency of stock control systems. In addition, standard deviation ranged from 0.686 to 0.877 indicating that there was less dispersion among the respondents.

Table 4.12: Descriptive Statistics on Organizational Performance

	N	Minimum	Maximum	Mean	Std. Deviation
Profitability Level	102	1	5	4.18	.861
Production Level	100	1	5	4.03	.784
Operational Improvement	101	1	5	4.42	.725
Cost Reduction	102	1	5	4.13	.779
Sales Volume	101	1	5	3.97	.877
Competitive gain	102	1	5	4.50	.686
Valid N (listwise)	98				

Source: Researcher (2016).

The general findings were further analysed through the coefficient of correlation as it is depicted in table 4.13. Whereby the correlation coefficient was (r=0.658, p<0.01) which indicated a relatively strong positive relationship between stock control systems and organizational performance.

Table 4.13: Correlation between Stock Control Systems and Organizational Performance

		Stock Control Systems	Organizational Performance
Stock Control Systems	Pearson Correlation	1	.658[**]
	Sig. (2-tailed)		.000
	N	85	83
Organizational Performance	Pearson Correlation	.658[**]	1
	Sig. (2-tailed)	.000	
	N	83	98

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Researcher (2016).

The above results all together are in line with other researchers such as Efiok *et al.,*

(2015) who obtained a correlation value of (r=0.721, p<0.01). This indicated a

positive correlation between inventory management practices and operational

performance. Mathiasa and Owour (2015) also found that there was a positive

significant association between inventory management system and organizational

performance. They obtained a correlation coefficient of 0.510, significant at the

0.10 level.

Anichebe and Agu (2013) also had the same conclusions on the association between

inventory management and company's effectiveness. Their findings indicated that

there was significant relationship between good inventory management and

organizational effectiveness.

CHAPTER FIVE

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Chapter overview

The chapter contains conclusion of the study, researcher's recommendations and areas for further research.

5.2 Conclusions

The main aim of the research was to assess the influence of stock control systems on organizational performance: a case of Tanzania Portland Cement Company. The conclusions drawn from the study was that there was a positive relationship between stock control systems and organization performance. The conclusion on basic profile of respondents was that most of the employees were male due to the nature of activities done in the company. Also, majority of workers were knowledgeable on the issues concerning inventory (stock) and had enough experience to give relevant information. This facilitated the collection of data from various departments. Since stores department had few employees the researcher decided to take more respondents from other departments, who were aware of issues concerning stock and the company's performance.

Secondly, stock control systems were applicable to raw materials and stores items and that final products were not included as inventory items. The final product (cement) was controlled under the operations department while raw materials and stores items levels were monitored by the stock controller. In addition, the company's main store had inadequate storage space due to the company's expansion, which resulted to increase in demand for stock items.

In relation to objective one the study concluded that, the relationship between MRP and organizational performance was positive and significant but not strong. Above all, material requirements' planning was an important technique in managing the company's stock and operations. The company demanded a right amount of raw material and at a required time. This system eased the company's operations so as to meet the targeted production levels. MRP therefore was crucial in decreasing of idle time during production. In relation to objective two, the study concluded that continuous replenishment of stock was positively and significantly related to organizational performance. This was an advantage to the company since timely stock replenishment enhanced business continuity. At the same time this system helped to reduce the level of stock held by the company hence reduces inventory cost.

The study also concluded that there was a relatively strong positive relationship between distribution resource planning and organizational performance. This was essential to the company's operations since it reduced lead time, enhanced efficient forecasting and improved customer service delivery. The system therefore helped in managing and controlling the company's inventory while satisfying the customers' needs. On the other hand, vendors' managed inventory and organizational performance had a medium positive relationship. This helped to reduce stock-out costs since inventory was controlled by the vendor and at the same time it was flexible in responding to stock requirements.

Therefore from the above conclusions, it was evident that stock control systems had a great influence on the company's performance. For a company to benefit it should

choose an appropriate system that will be suitable in controlling its stock. It was established that firms benefited from stock control management through simplified storage and retrieval of material, enhanced sales efficiency and reduced functioning cost. Findings indicated that stock control has a major effect on firm's productivity and profitability. The study concluded that stock management is extremely crucial to the achievement of objectives and development of organization.

5.3 Recommendations

Continuous replenishment should be done timely so as to avoid stock-out costs as well as ensuring right amount of stock is available when needed. It is important for the company to balance between having too much stock and having low or no stock at all. Equally significant, the focus of distribution resource planning should be to satisfy the customers' needs. When customers are satisfied, markets are guaranteed and at the same time business continuity is enhanced. Superior customer delivery, efficiency in forecasting and shortening of order processing time should be enhanced.

On the other hand, the company should embrace vendors' managed inventory so as to increase flexibility to respond to stock requirements as well as maintaining timely delivery of items to the company. The study finally recommends that techniques that minimize costs have to be utilized in the storing and distribution of stock. Since manufacturing process is done daily the operations need readily available materials and other inputs. For this reason, stock control system ought to make best use of space and on-time delivery to keep away from shutting down production.

Similarly, integration of the stock control system is important in order to stock items ordered and ensure they are delivered on time. A company is likely to maintain competitive gain through applying suitable stock control systems. For that reason, business firms have to diversify their stock control systems, to match specific requirements of production.

5.4 Areas for Further Research

Future studies can be conducted in other cement factories in Tanzania to see if similar results will be obtained. A comparative study can be conducted on all cement manufacturing industries to establish how each plant is fairing relative to its competitor. Also, Research can be done in other organizations, business centres and other sectors such mining, fishing and agriculture to see how the applicability of various stock control systems differs among sectors. Finally, research can be done on other stock control systems other than material requirements planning, continuous replenishment, vendor managed inventory and distribution resource planning which were used in the current study.

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APPENDICES

Appendix I: Questionnaire for the company staff

Dear respondent,

The purpose of this research questionnaire is to seek your opinions about the Influence of stock Control Systems on the performance of Tanzania Portland Cement Company Limited. Please feel free to answer this brief questionnaire which is mainly intended for academic purposes. The information collected will be treated with confidentiality. The questionnaire has two parts: **Part A** indicates the basic information about the respondents and **B** addresses the issues related to the study.

Part A: Basic information about the respondents

1. Gender (Please tick "√" the appropriate cell)   Male ( )   Female ( )

2. In which department are you working in the company?

Departmen t	Administratio n	Procuremen t	Productio n	Maintenanc e	Packagin g	Any other (Please (Specify)
Please tick (√)						

3. How many years have you worked with this company?

Years of service	Less than one year	1-5 Years	Above 5 years
Please tick (√)			

Part B: **The influence of stock control systems on organizational performance**

4. Please indicate the nature of items to which stock control is applicable by putting a tick ("√") on the appropriate cell: ☐ Raw materials ☐ Final products ☐ Stores

To what extent do you Agree/Disagree with the following statement? Please rate your agreement by ticking the suitable cell. Whereby; **1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 =agree, 5 = strongly agree.**

5.	Supply reliability of raw materials and other store items affects operations of the company	1	2	3	4	5
6.	The decreasing of idle time of production machines influences the targeted amount of output	1	2	3	4	5
7.	The smooth flow of information influences operational performance	1	2	3	4	5
8.	The reduced level of stock decrease storage costs	1	2	3	4	5
9.	Timely stock replenishment ensures business continuity	1	2	3	4	5
10.	The reduced rate of ordering decrease ordering cost and time	1	2	3	4	5
11.	Shortening the order processing time has increased the production volume	1	2	3	4	5
12.	The efficiency in forecasting requirements reduces unexpected shortages	1	2	3	4	5

13.	Superior customer service delivery boost the company's sales	1	2	3	4	5
14.	The flexibility to respond on stock requirements influences company activities	1	2	3	4	5
15.	Timely delivery of items reduces stock out costs	1	2	3	4	5
16.	Monitoring the minimum level of stock ensures smooth flow of operations	1	2	3	4	5
17.	Assured availability of raw materials help increase the level of profitability	1	2	3	4	5
18.	Efficient use of stock items increases the level of output	1	2	3	4	5
19.	Reliable supply of spare parts and other stock items improves operational activities	1	2	3	4	5
20.	Efficient inventory control techniques help reduce ordering and holding cost	1	2	3	4	5
21.	Reliable amount of stock influences sales volume	1	2	3	4	5
22.	Availability of quality stock is a competitive benefit to the organization	1	2	3	4	5

THANK YOU FOR YOUR COOPERATION IN PROVIDING THE

INFORMATION REQUIRED

Appendix II: Sample sizes for different sizes of population at a 95% confidence level

(Assuming data are gathered from all cases in the sample)

	Margin of error					Margin of error			
Population	5%	3%	2%	1%	Population	5%	3%	2%	1%
50	44	48	49	50	750	254	440	571	696
100	79	91	96	99	1000	278	516	706	906
150	108	132	141	148	2000	322	696	1091	1655
200	**132**	168	185	196	5000	357	879	1622	3288
250	151	203	226	244	10 000	370	964	1936	4899
300	168	234	267	291	100 000	383	1056	2345	8762
400	196	291	343	384	1 000 000	384	1066	2395	9513
500	217	340	414	475	10 000 000	384	1067	2400	9595

Source: Saunders *et al.,* (2009).