

**MATERIALS MANAGEMENT AND INVENTORY COSTS MANAGEMENT IN
ORGANIZATIONS**

**A CASE STUDY OF BRITANIA ALLIED INDUSTRIES LTD
UGANDA**

BY:

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**A RESEARCH PROPOSAL SUBMITTED TO THE SCHOOL OF BUSINESS
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DECLARATION

I, Mubiru Ronald (BSP/16205/71/DU), hereby declare that this research report is my original work and has not been submitted for a degree in any other university.

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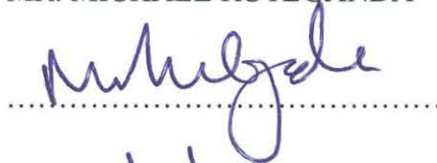
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APPROVAL.

I satisfy that the following research by Mubiru Ronald, which has been carried out under the title *Materials Management and Inventory Costs management in Organizations*, and has been under my supervision, is now ready for submission to be examined.

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DEDICATION

This piece of work is dedicated to my beloved late sponsor, HERMANN GMEINER, the founder of SOS Children's Villages and to the entire SOS family. May God, the Almighty Father, bless them abundantly.

ACKNOWLEDGEMENT.

Throughout the time of writing this report, I got maximum guidance inform of helpful advice, criticism and encouragement from my supervisor Mr. Michael Ruteganda with whom, I managed to finish my work on time. May you live longer to serve this nation!

Special thanks and sincere gratitude go to my brother Kizito Alex, mom Rose Nabukenya and cousin Lydia. The financial and moral support you've given me is enormous. Besides, the encouragement and guidance you've given will live to be remembered! May God bless you and your family copiously.

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LIST OF ABBREVIATIONS

1. J.I.T Just In Time.
2. E.O.Q Economical Order Quantity.

EXECUTIVE SUMMARY

One of the most frequently overlooked qualities of materials is that it represents money's worth. Organizations usually accord more respect and attention to \$1 in cash than will \$5 in goods. It is this odd trait of human nature that intrigued the researcher to investigate the essence of proper materials management on the inventory costs management system of an organization.

The research objectives were:

- a) To assess the effectiveness and the efficiency of materials management in organizations.
- b) To evaluate the various techniques of inventory costs management in organizations.
- c) To establish the essence of proper materials management in an organization's inventory costs management system.

This study relied on secondary data from Kampala International University library and other public libraries. Use of document analysis and extensive reviewing of different works by authors collected the data.

Data was analyzed by making inferences to the available literatures in order to compare and contrast different opinions. Basing on the findings, the researcher found out that there is a positive relationship between the two variables and recommended the following:

- a) A well-established materials management criterion should be tailored and undertaken.
- b) Order sizes that minimize the overall inventory cost should always be determined.
- c) Factors determining the level of inventory should be properly analyzed.
- d) Organizations must also establish a strong internal control system on stock.
- e) Organizations must also endeavor to establish an independent purchasing department.

CHAPTER ONE:

1.0

INTRODUCTION

1.1 Background to the study.

The relative importance of materials cost varies widely between different industries. In most industrial organizations materials represent a significant proportion of total costs of production. Where as in a set-up of sugar refining industry, materials may represent over 80 per cent of the total cost of production; in an extractive industry, there is really no direct materials cost at all. And in service industries, materials cost are not substantial to the organization's total costs' structure. All industries therefore lie some where within this spectrum (*Baggott, 1989*).

Inputs from suppliers that have not yet entered the process of transformation into output are essential in helping the business overcome problems faced by the purchasing department, for instance late delivery of materials (*Kakuru, 1998*).

Pandey (1995) takes inventory to include raw materials, work in progress, finished goods and supplies. Supplies constitutes a small percentage of the total investment in inventory that are purposely brought to facilitate production but do not enter directly into the process of production, unlike raw materials that is the heaviest investment in inventory.

Owler & Brown (1993) observes that the stores department in many firms is often neglected, and it's not realized that materials represent an equivalent amount of cash. Material pilferage, deterioration of materials and careless handling of stores lends to reduce profits, or even losses. This makes it essential to obtain maximum advantage of an inventory control system and an efficient, well-equipped stores department be maintained.

Inventories are those resources satisfying a current need and usually consist of more than 40 per cent of the firm's total invested capital. *Pandey (1995)* observed that a reduction in excessive inventories carries a favorable impact on a company's profitability. For efficiency and effectiveness, there should be feedback. The inventory manager works in a system with sub-systems, which must be coordinated (*Oyer, 1996*)

1.0 Statement of the problem.

Materials costs are relatively important and vary widely between different industries. They form the largest component of inventory costs, especially in industrial set-ups. One of the most frequently overlooked qualities of materials is that it represents money's worth. It is really an odd trait of human nature that \$1 in cash will often be accorded for more respect and attention than will \$5 in goods (*Baggott, 1989*). It is this challenge that intrigues the researcher to investigate the essence of proper materials management on the inventory costs management system in an organization.

1.1 Purpose of the study.

The focus of the study was to establish the essence of proper materials management on the efficiency of an inventory cost management system of an organization.

1.2 Research objectives.

- a) To assess the effectiveness and efficiency of materials management in organizations.
- b) To evaluate the various techniques of inventory costs management in organizations.
- c) To establish the essence of proper materials management in an organization's inventory costs management system.

1.3 Research question.

- a) How are materials managed in organizations?
- b) What are the major techniques of controlling inventory costs in organizations?
- c) What is the essence of proper materials management in an organization's inventory cost management system?

1.6 Scope of the study.

The study looked at a detailed understanding and analysis of the materials management, its significant on the inventory cost management system of an organization. A literature reviewed for the previous five decades.

1.7 Significance of the study.

In the researcher view,

- a) Organizations will be able to identify the major weaknesses and strength associated with the different types of materials management hence improving on the cost effectiveness in order to achieve profitability & liquidity trade-of.
- b) The findings will contribute to the exiting literature about materials management, and as it affects the overall performance of the inventory costs management system.
- c) Besides, new investors will use the results of the study to appreciate the different approaches to materials-inventory management, the problem areas and where, when and under what circumstances to apply these approaches, aware of their effects and implications.

1.8 Structure of the report.

There are five chapters. Chapter one introductions the research study, the background to the study, the problem statement, the purpose of the study, the study objectives, the research questions, scope of the report, the significance of the report and the overall report's and structure. Chapter two is basically the methodology and will have the design of the research, data source, the method of data collection, how data will be processed and analyzed and the limitations to the study.

Chapter three is fully a literature review on materials management, importance of materials, effectiveness and efficiency of materials management, purchasing of materials, accounting for materials, the components of inventory, management of inventory in organizations, the models of inventory management, the problems associated with inventory management, a relationship between materials management and inventory cost management in organization, the inventory information systems and the conclusion.

Chapter four interprets and discusses the findings.

And chapter five has summary, conclusions and recommendations to the findings. Its also includes a recommendation on an area of further study.

CHAPTER TWO:

2.0 LITERATURE REVIEW.

This chapter reviewed the aspects of inventory cost management. Most of the study has been carried out in developed countries hence an existence of a gap as far as developing countries are concerned. This makes the studies in exhaustive. However, selected text books and journals were reviewed for the relevant literature.

2.0.1 Materials Management

Material management is the integrated functioning of purchasing and its allied activities so as to achieve the maximum co-ordination and optimum expenditure in the area of materials (*Nair, 1996*).

Materials management is a function that supports the complete cycle of materials flow from the purchase and control of production to the planning and control of work in progress, to the ware housing, transporting and distribution of finished goods (*Adams and Ebert, 1992*).

2.0.2 Inventory Components

An inventory is an idle resource held for future use, whenever inputs or outputs of a company are not used as soon as they are available, inventory is present (*Dilworth, 1992*).

Pandey (1995) observed inventory as a stock of products a company is manufacturing for sale or components that make up the product. And in manufacturing concern, inventory may take the form of raw materials, work in process and finished goods. Raw materials inventory are bought out components used in the making products. Where as work in progress are partly finished products and existing because of time it takes a product to be made. And finished goods are those inventoried because customers' demand for a given time period may not be known.

2.0.3 Inventory Cost Management in Organizations

Inventory constitutes a significant portion of current assets of any enterprise *Johnson et al (1973)*.

According to *Arnold(1998)*, management inventories has the major components of determining the flow and kinds of inventory needed, supply and demand patterns, functions that materials perform, objectives of materials management, costs associated with materials.

2.0.4 Inventory-associated costs.

Pandey (1995) articulated that investment in inventory has major dangers of unnecessary tie up of the firm's funds and loss of profits, excessive carrying costs and the risk of liquidity. Effective materials management is important and can be advantageous to companies undertaking it.

However, there are costs associated with inventory that includes ordering cost, stock out costs, carrying costs(*Pandey, 1995*) and material cost and capacity related costs(*Arnold 1998*).

Halpern et al (1983), classified material costs as carrying costs, cost of running short of stock, shipping, receiving and ordering costs. Ordering costs refer to the entire costs of requisitioning, purchasing, ordering, transporting, receiving and inspection. Carrying cost is incurred for maintaining a given level inventory and includes storage, deterioration and obsolescence. And stock out costs accrue to a firm as stocks run short hence a possible loss of customers and also a liability resulting from failure to deliver on time.

2.1 Effectiveness and Efficiency of Materials Management

It is a necessity for a cost of materials to be widely considered other than just the amounts paid to suppliers. Production delays can be expensive in the wages paid to idle workers, in the cost of providing unused facilities, and in the reduced profits through loss output. However, different materials call for varying degrees of attention in accordance to their relative values and risks of deterioration during storage hence the more precious or valuable a material, the higher the attention to be paid since they will be representing a higher risk of loss. Material cost is principally ascertained from two primary documents- the suppliers invoice setting out the value of goods purchased and the stores requisition detailing the material issued to production. The two documents constitute a whole complex organization of Control (*Baggot, 1989*).

Hence, the following activities generally come within the sphere of materials, stocks control where there's planning and maintaining stocks of raw materials, tools and general supplies; purchasing that includes developing sources of supplies; purchasing that includes developing sources of supply, finalizing prices, placing orders, obtaining materials by the right time, storing, issuing as well as handling within stores; and traffic where incoming materials are cleared, both inland and foreign dispatched finished goods. (*Nair, 1996*).

An emphasis on material management system can be appropriate where transportation and inventory cost are substantial. (*Render and Heizer 1992*).

a) Stock control process.

Material control process is the science-based art of controlling the amount of stock held by the business profit or providing a stated a minimum customer service. (*Lewis, 1970*).

Lucey (1996) observes that the need to control material receipt and issues by the firm should be inevitable.

Nair (1996) also referred to stock control as a of planning and maintaining the right quantity of materials for a given Production programmed with the right quantity of materials for a given production programmed with the minimum of investment.

b) Inventory recording.

Jordon (1997) asserts that it's important to have an accurate inventory records...this accuracy must be at least 95 per cent for critical or high or high unit value items. To him it's important to maintain a cycle system.

Stock accounting is important in any firm as it registers the changes in the levels of stock held to realize maximum value and avoid tying up funds (*Frank Woods, 1996*).

c) Production planning & scheduling.

As observed by *Dilworth (1992)*, a production plan states in general terms the total amount of output that the manufacturing department is responsible to produce to each period in the planning horizon.

d) Stock valuation.

As observed by *Frank woods (1996)*, the way materials are valued has an implication on the firm's report net profit, the material usage and balance. Therefore different inventory valuation methods lead to different profits reported by firms. The different material valuation methods include Last in First out, First in First out, Average cost method and Net realizable method.

The chosen material valuation should be used consistently in order to meet the requirement of consistency policy of accountability and any change should be reported and its impact on the reported profits (*Millichamp, 1996*).

2.1.1 Purchasing of materials.

Purchasing is the function of buying machinery, tools, general supplies, raw materials, required by an organization (*Nair, 1996*).

The buying of raw materials is encountered with a lot of waste and inefficiency. It is of essence for an overall responsibility for buying to vest in a single person to avoid the waste and inefficiency. Whereas in large companies, there are usually well-staffed department under a chief buyer, in most small companies, buying may be no more than the participative occupation of one man-possible holding some other responsibilities (*Baggot, 1989*).

2.1.2 Accounting for materials.

The stores account is debited with materials received with issues from stock. The debits are raised from goods inward note, which has been priced from a copy of purchase order and, in this way, the ledger posting can be updated daily. Materials issued against stores requisition will be priced from stores ledger account and credited thereto. (*Baggot, 1989*).

Wald (1984) noted that in case of a receipt, particulars of goods are entered into the goods received note that is posted to the purchasing department, origin of purchase department and also retain for reference in the goods inwards department. Direct materials are debited to the work in progress account and indirect materials are debited to the overheads account.

2.2 Inventory costs management techniques.

Inventory models range from those concerning stock files and movement of stock records to economize costs calculated according to a number of formulas (*Holstein, 1998*). Inventory models aims at minimizing costs. The key issue is the determination of when to order and how much to order.

2.2.1 Trial and error model.

According to *Pandey (1995)*, Trial and error method of inventory control is the simplest. In this case, management determines the level of inventory basing on the prices, orders and value of items in inventory.

2.2.2 The Just in time model.

Some authors believe that there is no inventory of purchased goods awaiting inspection, no materials awaiting manufacturers or moving from one department to another (*Burt, 1989*).

Balunywa (1998) described the model as a system where inventories or goods to be used or sold arrive just in time to be used, assembled or sold.

JIT approach primarily focuses on minimizing inventories held in the firm to zero balance where the organization must then precisely acquire inventory at the moment they are required (*Kakuru, 1998*).

2.2.3 Two-bin system.

This involves the storage of each item in two storage bins. In case the first bin is emptied, an order must be placed for re-supply. The second bin will contain sufficient quantities to last until fresh delivery is made (*Burt, 1989*).

The two bin system of stock control is a system where new deliveries of materials are divided into two parts. The first part is equal to the re-order level and balance is the

second part, only available for issue on demand. Where there has been an issue of the second part (bin), a replacement order is sent to the supplier (*Baggott, 1989*).

2.2.4 A-B-C analysis model.

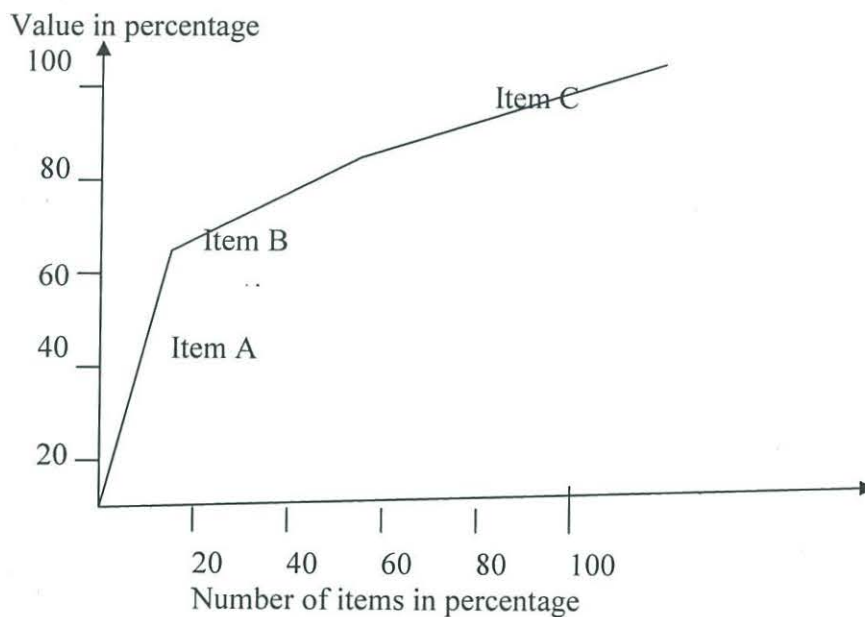
Because most firms maintain different types of inventories with different value, minimum attention is devoted to different items with highest value (*Pandey, 1995*).

The different in value of the different classes of inventory leads to the inventory control model by importance and expectation or A-B-C analysis (*Richmond, 1969*).

Kakuru (1998) also maintains that A-B-D analysis model classify items of inventory into their relative importance according to their annual requirements.

As observed by *Jordan (1997)*, 'A' item are given tight control where as; C' is given the least control.

Diagram 2.2 Graphic presentation of ABC analysis.



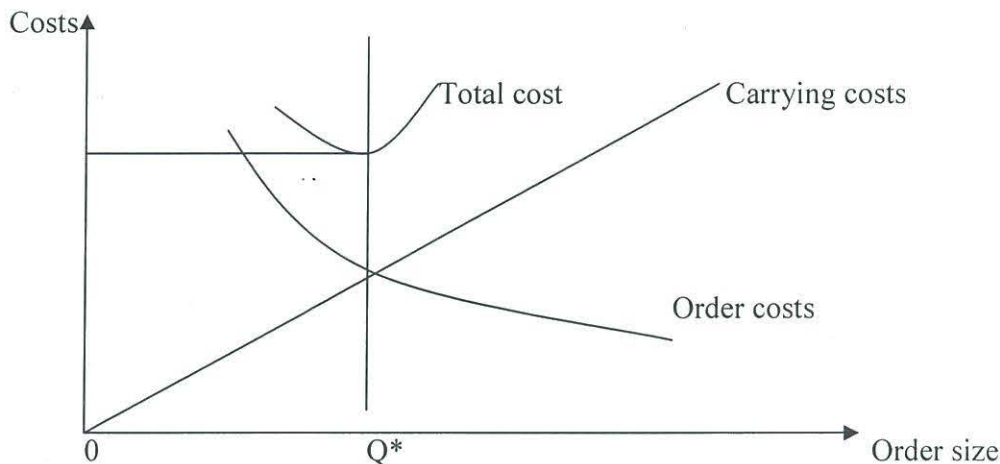
Source: *N.K Nair Purchasing and materials management (1990), page 77.*

In the above illustration, items A will be approximately 10% in the number but represent 70% of the value of total inventory, B will be 20% in number but representing 20% of the total value of inventory and C will be 70% in number but representing only 10% of the total value of inventory.

2.2.5 Economic order quantity (E.O.Q), re-order point and safety stock.

Balunywa (1998) observed E.O.Q to sometimes mean as re-ordering quantity. It is the normal quantity to be placed on order when the stock has reached its order level. As articulated by *Pandey (1995)*, one of the major inventory management problems to be resolved is how much inventory should be added when inventory is replenished.

Diagram 2.2.2 an economical order quantity function.



Source: *I.M. Pandey Financial management (1995), Page 834.*

In the illustration, E.O.Q occurs at Q^* where total cost is minimum. Hence, maximizing operations profits.

The problem, how much to order, is solved by determining the E.O.Q, yet the answer should be sought to the second problem, when to order. This helps you determine the re-order point. A re-order point is that inventory level at where an order should be placed to replenish the inventory. And in order to guard against stock out, the firm may maintain a safety stock. A safety stock is a minimum inventory (buffer inventory) as cushion against expected usage and/or delay in delivery time (*Pandey, 1995*).

2.3 The relationship between Materials management and Inventory cost management in organizations.

Pandey (1995) took inventory to include raw materials, work in process, finished goods and supplies. Where raw materials are bought out components used in the making of products, work in process are partly finished products that came out of raw materials in its original form, finished goods are processed raw materials ready for sale and supplies, that constitutes a small percentage of inventory, are to purposely facilitate production and not entered directly into the process of production.

Owler & Brown (1993) observed it as an essential to obtain maximum advantage of an inventory control system and an efficient, well equipped stores department.

2.3.1 Importance of materials management.

In the ideal world where the demand upon a business is known exactly and well in advance and where suppliers keep to their due dates, there would be little need to hold any form of inventory other than limited amounts of work in process stocks caused as a by-product of manufacturing operations (*Lewis, 1970*).

The importance of materials management can be realized when it is said that purchases account for nearly 50 per cent of an organization's annual expenditure; that nearly 80 percent of the working capital is tied up in inventory and the inventory carrying cost is almost 25 percent a year; that materials represent 40 to 60 percent of the sale price or 60 to 80 percent of the production cost of a product and that even a saving of 5 percent in material cost will substantially increase the profit margin of the enterprise(*N.K.Nair, 1996*).

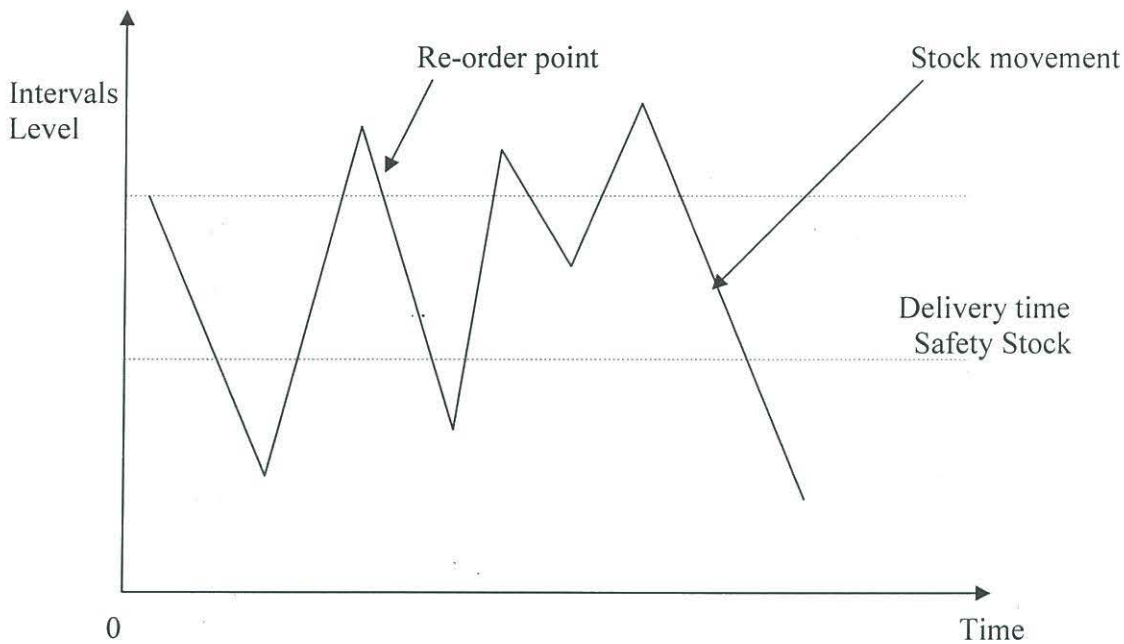
In most industries, materials represent a significant proportion of total cost of production. There's also a wide range in the relative values of individual materials, say from precious metals to iron ore. The relative importance of materials costs varies widely between different industries, for example materials could represent over 90% of the total production cost in a sugar refining industry, whereas in a extractive industry there's no direct material cost at all (*Baggott, 1989*).

2.3.2 Inventory trend management.

The changes in the level of materials have important economic effects. During periods of declining sales, materials may not be replenished so that further importers are given a drop off gross national product (*John et al, 1975*).

Since materials serve the uncouple successive operation in the process of making a product and getting it to customers, a continuous review of material level is vital (*Magee, 1956*).

Diagram 2.3.1 Changes in the level of material.



Source: Dilworth Operations management (1992) McGraw Hill-page 3.

In the above illustration, the economic, the economic order quantity, re-order point refers to the quantity and period when a replenishment order is placed; the delivery interval is the time between the placement of an order and the actual delivery of materials. Safety stock is kept to insulate the firm against delays in delivery.

2.3.2 Inventory information systems.

Charles (1982) referred to an inventory management system as a system that is primarily concern with optimizing inventory balances so that net income is maximized.

For efficiency and effectiveness, there should be feedback. Inventory managers also works in a system with sub-systems, which must be co-coordinated (Oyer, 1996).

2.2 Conclusion.

From the above study, inventory cost management is seen as an important function of a manager. The basic purpose of holding inventory is that of making each function of the business operationally independent of other functions and major questions that arise are how much to order and when to order.

It has also been widely accepted that material, a component of inventory, cost represents a large proportion of total cost of production in a manufacturing organization-ranging from 50-90 per cent of total cost of production.

Investment in inventories commits; therefore management of both level of inventory and composition of inventory is important in order to obtain a liquidity-profitability trade-of. An organization must therefore establish an effective and efficient material management system in order to minimize the total inventory cost hence minimizing an overall total cost.

CHAPTER THREE:

3.0

METHODOLOGY

This chapter concerns the description of how the study was undertaken and involves the study design, sources of data, collection methods, processing, analysis and presentation.

3.1 Research design.

The research was mainly descriptive and explanatory in nature because of the type of the research (type c) which required the researcher only to review different literature written on a similar topic by past researchers and explain the literature in relation to the current topic under research and the main purpose was to obtain qualitative data basing on the theoretical data focusing on the essence of proper materials management on an overall inventory costs management system in an organization.

3.2 Source of data.

The descriptive and explanatory nature of the research that based on secondary data made the researcher only to use the secondary data. Secondary data are already written data by other authors about the related to the one under research.

3.3 Secondary data.

The researcher reviewed the exiting literature postulated by other scholars, it was however limited to the variables under the study hence more of the essence of proper materials management on the overall inventory costs management in organizations and these information were got from text books, internets, journals and magazines.

3.4 Data collection method.

The researcher used document analysis methods. This basically comprised of the library research techniques where there was an extensive review of different works of other authors since data were from secondary sources.

3.5 Data processing and analysis.

3.5.1 Data processing.

Data were sorted, edited and recorded with the aid of computer to ensure that data are accurate and complete from the research findings reviewed in the literature.

3.5.2 Data analysis.

The researcher analyzed data by specifically making inferences to the available literature in order to compare and contrast the different opinions represented by different authors. The analysis mainly focused on the identification of the differences and similarities that were between the available literatures.

3.6 Limitations to the study.

3.6.1 Time constraints.

The time allowed to the researcher was not sufficient enough since the research required an intensive reading of various literatures in order to obtain realistic information about the topic under research.

3.6.2 Finance constraint.

The researcher faced specific costs of computerizing the research work like processing the data and accessing the internet services.

3.6.3 Limited information.

This is type 'c' research that demanded an intensive review of literature in the area of study. The required information was not readily available to the researcher, which made the researcher to move in many libraries and read many journals, magazines and textbook. This made the research costly.

3.7 Time frame.

The time used during research was as follows.

<u>Activity</u>	<u>Month (2010)</u>
• Project work review	April
• Development of topic	April
• Meeting supervisor	April, May, and June
• Development of research problem	April
• Collection of data	April, and May
• Analyzing data	June
• Preparation of report	June
• Submission of report	July

CHAPTER FOUR:

4.0 PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

This chapter presents the findings of the study. The researcher collected data from its secondary sources like text books, journals, internets and magazines. The data collected was then edited, coded, analyzed, presented and interpreted. Findings were presented according to the objectives of the study and its respective research question.

4.0.1 Materials management.

Nair (1996) described materials management as an integrated function of purchasing and its allied activities so as to achieve the maximum co-ordination and optimum expenditure in the area of materials. Where as, *Adams and Ebert (1992)* referred to materials management as a function that supports the complete cycle of materials flow from the purchase and control of production to the planning and control of work in progress, to the ware house, transporting and distribution of finished goods.

Materials management is therefore an integrated management function that supports a complete cycle of a materials flow right up from an initiation of purchase to the distribution of a finished good or service.

4.0.1 Inventory components.

Dilworth (1992) took inventory to be an idle resource held for future use. Where as *Pandey (1995)* observed an inventory as stocks of products a company is manufacturing for sale or components that makes up a product.

Inventory may not necessarily be any idle resource held for future use as stated by *Dilworth* because some idle resources are not inventories to an organization, say a machine to be used in the future. It must therefore be a stock of product that a company is manufacturing as stated by *Pandey*. Inventory, therefore is a stock that has been produced or bought by a company and specifically meant for future use.

4.0.2 Inventory costs management in organizations.

Where as *Johnson et al (1973)* complimented that inventory constitutes a significant portion of current assets, *Arnold (1998)* also stated that management inventories has the major components of determining the flow and kinds of inventory needed, supply and demand patterns; functions that materials perform, objectives of materials management has the major components of determining the flow and kind of inventory needed.

All in all, an investment in inventory commits a firm's resources; therefore careful management of both the level of inventory is important in order to obtain liquidity-profitability trade-of since inventory is the least current asset.

4.0.3 Inventory-associated costs.

Whereas *Pandey (1995)* articulated that investment in inventory has major dangers of unnecessary tie up of the firm's fund and hence costs associated included ordering costs, stock-out costs and carrying costs; *Halpern et al (1983)* also classified material costs as carrying costs, cost of running short, shipping-receiving and ordering costs.

Effective inventory management is important and can be advantageous to organizations undertaking. Inventory costs principally constitute its costs of ordering, carrying and stock-outs.

4.1 Effectiveness and efficiency of materials management.

Baggott (1989) articulated that material cost is principally ascertained from two primary documents, the supplier's invoice setting out the value of goods purchased and the stores requisition detailing the materials issued to production. The two documents, to him, constitute a whole complex organization of control. However, *Nair (1996)* also stated that activities that generally come within the sphere of materials includes, stock control, purchasing, value analysis and traffic control. Whereas, *Render and Heizer (1992)* also observed that an emphasis on materials management system can be appropriate where transportation and inventory cost are substantial.

Costs of materials therefore calls for a much wider considerations than just the amount paid to suppliers. Production delays can be expensive in the wages paid to idle workers, in the cost of providing unused facilities, and in the reduced profits through lost output. Consequently, it is necessary to ensure where possible that such delays do not arise. The cost accountant, therefore, must be concern with creating the environment that will achieve this, even though the material control department is always independent of the accounting function. Management accountancy should be directly concerned with the introduction of an effective and efficient system of stores controls. Some materials management techniques include:

a) Stock control process.

Lewis (1970) described stock control process as a science-based art of controlling the amount of stock held in various forms, within a business to meet economically the demands placed upon that business. Whereas, *Lucey (1996)* referred to stock control as a basic need to control materials receipt and issues by the firm. And *Nair (1996)* referred to stock control as a function of planning and maintaining to the right quantity of materials for a given production programmed with the minimum of investment.

Receipt and issues of materials in organizations should not take only the control aspect of materials as articulated by *Lucey*. It must involve an element of planning as well, as viewed by *Nair*.

However, no matter the sophistication of the stock control system, the basic pre-requisite is that stock movement should accurately be recorded. A conformance to the inventory

control system that basically monitors stock level, forecasts demands and decides on the timing of the purchase.

b) Inventory recording.

Jordan (1997) asserted that it's important to have an accurate inventory records....an accuracy of at least 95 percent for critical or high unit value items. However, *Frank Woods (1996)* observed that stock accounting is important in any firm as it registers the changes in the levels of stock held.

Accuracy should be considered in principle and not only on high value items as stated by *Jordan*. And stock must always be accounted for.

In the view of reducing the error relating to inventory accountability and accuracy in an organizations investment in materials, inventory recording must be undertaken and this may take the form of stock taking and spot checks.

c) Production planning and scheduling.

This states in general terms the total amount of output that the manufacturing department is responsible to produce to each period in the planning horizon (*Dilworth, 1992*).

This implies that firms should provide enough time between the planning and the actual implementation of the plans. This can be done through a strategy of absorbing demand fluctuations by varying inventory level incurred to meet non-uniform demand.

d) Stock valuation.

Frank Woods (1996) specified that the different valuation methods of inventory leads to different reported levels of profits. *Millichamp (1996)* also supplemented that a chosen material valuation method should be used consistently in order to meet the requirement of consistency policy of accountability.

During inflation, LIFO understates the cost of sales and overstates sales, where as FIFO does not observe the prudent concept of accountancy. However, for the sake of Ugandan accounting practice, FIFO and AVCO would prevail, for LIFO is not practicable in reference to the companies Act. But AVCO is highly recommended for its compromises the weakness in both FIFO and LIFO. However, organizations should identify and employ the stock valuation method, which is in line with their objective and legal and accounting frame work.

4.1.1 Purchasing of materials.

Nair (1996) referred to purchasing as a function of buying, whereas, *Baggott (1989)* supplemented that buying of raw materials is encountered with a lot of waste and inefficiency.

4.1.2 Accounting for materials.

Baggott (1989) stated that where a receipt is, the stores account is debited with materials received and credited with issues from stock. And in case against stores requisitions would be priced from stores ledger account and credited there to. Whereas *Wald (1984)* noted that in case of a receipt, particulars of goods are entered into the goods received note that is posted to the purchasing department, origin of purchase department and also retain for reference in the goods reward department. Direct materials are debited to the work in progress account and indirect materials are debited to the overheads account.

It is however usual to set up a receiving, or goods inward department at the entrance of an organization, to which carriers of goods must report. This makes it easier to examine goods before they are entered into the organization.

The store ledger is therefore the basic accounting record for materials and contains an account for each separate item held in stock. Thus, the store requisition is also a journal voucher where corresponding debits for stores issues will be posted to the work in progress ledger, for indirect materials

4.2 Inventory cost management techniques

Inventory model basically aim at minimizing inventory cost .The key issue is the determination of when to order and how much to order .The major techniques of controlling inventory cost in organization include

4.2.1 Trial and error method.

Pandey (1995) took this model to be the simplest and management here tends to determine the level of inventory basing on the price, order and value of item of inventory

The model may not be efficient where the cost of inventory is quiet substantial to an organization's cost structure and at the same time requires a higher level of scrutiny

4.2.2 The Just in Time (JIT) model.

Balunywa (1998) also described the model as a system where inventories or goods to be used or sold arrive just in time to be used, assembled or sold .Whereas, in accordance to *Kakuru (1998)*, JIT approach is described to primarily focus on minimizing inventories held in the firm to zero balance where the organization must then precisely acquire inventory at the moment they are required .And *Burt (1989)* believe that there is no inventory of purchased goods.

The model basically ensures that inventory does not exit as described by the different authors. However, model disregards the ideal importance of lead time rendering the EOQ model virtually useless.

Such a model is therefore less applicable in manufacturing firms of developing nations like Uganda since their source of raw materials is cropped by a lot of uncertainties, thus the element of lead time can not be totally eliminated.

4.2.3 Two-bin system.

Baggott (1989) referred to the two bin system of stock control as a system where new deliveries of materials are divided into two parts. Where the first part is equal to the re-order level and balance is the second part, only available for issue on demand. And when there has been an issue of the second part (bin), a replacement order is sent to the supplier. *Burt (1989)* also described it as a system that involves the storage of each item in two-storage bin. Incase the first bin is emptied; an order is placed for re-supply.

Both authors emphasize on the storage of inventory into two-bins hence the periods delivery is equal to the period's average budgeted usage.

Consequently there may be no need to establish either an EOQ or a re-order level. However this may result into holding too much or little stock since it's not based on any formal analysis of stock usage.

4.2.4 A-B-C analysis model.

Pandey (1995) observed that since firms maintain different types of inventories with different value, minimum attention is devoted to different items with highest value. Whereas, *Richmond (1969)* specified that the difference in value of different classes of inventory leads to the inventory control model by importance and exceptions or A-B-C analysis model classifies item of inventory into their relative importance according to their annual requirements.

This analysis therefore classifies items of inventory into their relevant importance according to their annual requirements. Items that are required in high values are classified in A category, those with medium needs in B category and those with low annual utilization value in category C. Hence, because of the value attached to category A, inventories are tightly controlled and their demand is therefore determined through an extensive analysis. These requirements are then relaxed for categories B and C.

Proper A-B-C analysis leads to better control over material and consequent reduction in costs associated with materials.

4.2.4 EOQ, re-order point and safety stock.

Balunywa (1998) observed EOQ to sometimes mean as re-ordering quantity and is the normal quantity to be placed on order when the stock has reached its order level. Whereas, *Pandey (1995)* stated that an EOQ of an inventory will occur at a point where the total cost is minimum. He referred to the inventory level at which the firm places an

order to replenish as the re-order level. And the level at which the firm places an order to replenish inventory is referred to as a re-order point.

This model basically answers the inventory questions of when to order and how much to order. By arriving at the EOQ through $Q^* = \sqrt{(2AO)/C}$, you will have answered the question of how much order. Where Q^* represents the maximum operating profits, A is the annual demand, O is per order cost and C is the per unit carrying cost. Where as by getting the re-order point, you will have answered the inventory problem question of when to order. This entirely depends on lead time and its usage rate. In perfect certainty, re-order point will be equal to, lead time $\times$ usage rate. However in practice, there is uncertainty about the lead time and usage rate hence firms maintain safety stock, which serves as a buffer stock, hence, re-order point will be given as; lead time $\times$ usage rate + safety stock.

Hence, when buying raw materials, organizations must decide lots in which it has to purchase on each replenishment and how much production to make a component that presents an order quantity problem. The task of an organization is to determine the optimum or economic order quantity. The E.O.Q is that level which minimizes the total ordering and carrying costs.

Consequently, one must note that the size of EOQ depends on; inventory level, cost of purchasing and receiving, average consumption, interest on capital, quantity discount and availability of storage accommodation.

4.3 The relationship between materials and inventory cost management in Organizations.

Pandey (1995) took inventory to include raw materials, work in progress, finished goods and supplies. Whereas, *Owler & Brown (1993)* observed that materials represent an equivalent amount of cash. This in their view made it a necessity to obtain maximum advantage of an inventory control system and an efficient, well equipped stores department to be maintained. However, a material, in most industries, is taken by *Baggott (1989)* to represent a significant proportion of total cost of production-mostly ranging from 50 to 90 per cent of total cost of production.

Material, therefore, is generally a component of inventory as articulated by *Pandey* and constitutes a substantial proportion of the inventory cost. However, for the sake of service industries, materials cost may not be substantial to the total cost structure of an organization, a contrary to what *Baggott* stated. This may also apply in some extractive industries as well.

All in all, it's a necessity for a cost of materials to be widely considered other than just the amount paid to suppliers. Production delays that may come out of poor materials management can be expensive in the wages paid to idle workers, in the cost of providing unused facilities, and in the reduced profits through lost output. Hence, where there is proper materials management system, an inventory cost management system is in position to overcome inventory cost management problems of a need to place a

manufacturing order which includes, forecasting system, an inventory cost management problems of a need to place a manufacturing order which includes, forecasting system needs, production lead times and production lot sizes and what distribution of demand from suppliers. And the need to place a replenishment order that involves forecasting needs, how much to order and what safety stock to maintain.

4.3.1 Importance of materials management.

Nair (1996) observed that the importance of materials can be realized when it is said that purchases account for nearly 50% of an organization's annual expenditure; that nearly 80% of working capital tied up in inventory and inventory carrying costs is almost 25% a year; that materials represent 40 to 60% of the sale price or 60 to 80% of the production cost of a product and that even a saving of 5% of material cost will substantially increase the profit margin of the enterprise. Whereas, *Baggott (1989)* noted that the relative importance of materials cost varies widely between different industries, for instance, materials could represent over 90% of total cost of production in a sugar refining industry, whereas in an extractive industry there is really no direct material cost at all. And *Van Horne (1989)*, however, identified the usefulness of materials management so as to allow the firm to be flexible, permits efficient production scheduling and utilization and gives the firm flexibility in its purchasing. However, Raw materials were also taken to be kept as a result of buying large quantities to spread order costs over more units (*Lewis, 1970*). *Starr et al (1962)* concluded that the motives of holding raw materials include the transaction, precautionary or speculation motives. And *Johnson et al (1973)* maintained that stock levels are kept to absorb random fluctuations in the purchasing, production or sale and maintaining an even flow of production.

An organization can maintain an adequate inventory (with raw materials inclusive) for a continuous supply of the factory for an interrupted production or even guard against unpredictable demand and to be able to take advantage of price fluctuations as articulated by *Van Horn and Johnson et al*. Stock levels can also be maintained in cases of slow deliveries or where the materials does not meet the specification and occasional delays at one stage or the other in the process to avoid making customers wait for delivery. Purchases does not necessarily account for nearly 50 percent for all organizations, for in service industries purchase cost may not even be substantial to an organization's cost structure as stated by *Baggott*. This makes the working capital not to be tied up in inventory and consequently a reduction in a percentage of material cost not necessarily increase the profit margin of an organization as stated by *Nair*.

However, the importance of material as a cost requires the cost accountant's attention in the management aspects of all materials. Never the less, different materials call for varying degrees of attention according to their relative values and for risks of deterioration during storage. Precious or valuable metals represent a far high risk of loss than the base metals, since their intrinsic value for a given quantity is far greater, and they are also inherently more attractive to dishonest people. Consequently, it's necessary to keep a tighter control over the more valuable items. Deterioration risk during storage will also vary widely, and greater care and closer control is required for the perishable

materials, than is necessary for the non-perishable ones. Activities that generally within the sphere of materials management therefore includes; stock control, purchasing, store keeping and traffic control.

4.3.2 Inventory trend management.

Magee (1956), observed that since materials serve the uncouple successive operation in the process of making a product and getting it to customers, a continuous review of material level would than vital. Whereas, *Johnson et al (1973)* also observed that the changes in the level of materials have important economic effects.

Generally, during other periods materials may be built up at a more rapid rate than sales. However, modern methods of managing materials in recent years especially the use of competitions has cut the size of inventory in relations to sales.

4.3.3 Inventory cost management system in organization.

Charles (1982) described an inventory management system as a system that is primarily concerned with optimizing inventory balances so that net income is maximized. Whereas, *Oyer (1996)* observed that for efficiency and effectiveness, there should be feedback. Inventory managers also work in a system with sub-systems, which must be coordinated.

Basically, top management's task is to formulate inventory policies that will result in an optimum inventory investment, will promote efficiency and will control errors. Hence, the chain between the user departments, procurement, stores, suppliers and any other stake holders need not to break to ensure a smooth operation of the inventory management system.

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

In this chapter, findings were summarized and conclusions drawn basing on the analysis and interpretation of the research. Possible recommendation and an area for further research were also stated.

5.1 Summary of findings.

This section presents a summary of findings from the study.

Materials Management

It's a management function that supports the cycle of materials flow, form the purchase and control of production, to the planning and control of work in progress, warehousing, transporting and distribution of finished goods.

Effectiveness and efficiency of materials management in organizations.

For materials management to be effective and efficient, organizations must put an emphasis on the activities associated with materials flow and the respective associated costs. Activities include production control, inventory control and materials handling. Associated costs includes ordering costs and carrying costs principally, other costs, also incurred are opportunity costs of interest on investment, and especially prominent cost, quantity discounts, contributions margins on cost sales, space costs, overtime premiums, idle time, expediting, transportation, obsolescence, training, personal property tax, insurance and handling.

All in all, in a material management system there should be feed back. An inventory manager also works in a system with sub-systems; say materials management system, which must be coordinated.

Inventory components.

An inventory is an idle resource held for future use. Thus, whenever inputs or outputs of an organization are not used as soon as they are available, inventory is present. In a manufacturing concern, inventory may take firm of raw materials; work in process and finished goods. Cost associated with inventory management includes ordering costs, stock out costs, carrying costs, material cost and capacity related costs.

Inventory constitutes a significant proportion of current assets and total costs of an organization. Investments in inventory therefore commit a large percentage of a firm's resources. This makes it important to carefully manage both the level and composition of

inventory in order to obtain a liquidity-profitability trade-off since inventory is the least liquid current asset.

Inventory cost management techniques.

Several management models have been advanced to address the problems related to inventory management. The inventory models basically aim at minimizing costs. These models include:

a) Trails and error model.

This is where management determines the level of inventory basing on the prices, orders and value of items in inventory.

b) The just in time model.

A Japanese originated model where it's believed that there is no inventory of purchased goods hence inventory is precisely acquired at the moment they are required.

c) Two-bin system.

This is where each item is stored in two bins and where the first bin is emptied, an order is placed for re-supply.

d) A-B-C analysis model.

This is applied where firms maintain different types of inventory. The difference in value of the different classes of inventory will lead to an inventory control model by importance and exception, the A-B-C analysis. Hence, high value items are classified as A, those with medium needs-B and those with low utilization value in category C.

e) Economic order quantity, re-order point and safety stock.

The E.O.Q is that level which minimizes the total ordering and carrying costs of inventory, an optimum point. This solves the inventory management problem question of how much to order.

Re-order point is that inventory level at which an order should be placed to replenish inventory, hence solving an inventory management problem of when to order.

And a safety stock is a minimum inventory as cushion against expected increased usage and/or delay in delivery time. It guards against stock-out related problems.

5.2 Conclusions.

The following conclusions were made from the above findings.

Inventory management requires an effective and efficient materials management system. This includes minimizing the associated costs of materials management and focusing on the activities associated to materials management.

Materials management is a necessary requirement in all business to avoid the risk of quite substantial losses, which is inherent in holding stocks.

Investment in inventories commits a firm's resources; therefore management of both the level and composition of inventory is important in obtaining a liquidity-profitability trade of organizations must therefore establish an effective and efficient material management system in order to minimize the total inventory cost hence minimizing on overall total cost.

5.3 Recommendations.

The following recommendations were suggested on the study findings in order to improve on the efficiency and effectiveness of materials management function in an organization.

In order for organizations to minimize the stock management constraints, a well established materials management criterion should be tailored and undertaken in order to ensure that proper materials (in terms of quantity and quality) are available at the right time and cost. Besides, organizations must also establish a strong internal control system on stock. Systems that can ensure proper, accurate and timely record of transactions as and when they take place, regular management counts involving items in stock and accurate valuation and accounting for stock.

Organizations should strengthen their inventory information systems through the used computers and improved manual techniques so as to improve its ability to manage and predict accurately the stock turns over.

Order sizes that minimize the over all inventory costs should be determined and purchased. It should easily be determined by the inventory information system in place. Proper analysis of all the factors determining the level of inventory, the demand trends, the economic performance and the expected actions should be taken. Organizations must also endeavor to establish an independent purchasing department charged with performing all purchasing functions of an organization. This should be accompanied by a proper segregation of duties, recording, accountability and responsibility should be observed in its department and the internal audit section must appraise their performances.

5.4 Area for future Research.

Future research could be carried out on.

- a) Quality of raw materials and profit maximization in organizations.
- b) The efficiency of inventory cost management.
- c) Quality of raw materials and efficiency of Production.

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APPENDICES

APPENDIX A

THE TIME FRAME OF THE STUDY

ACTIVITY	PERIOD(2010)
Project work review	April
Development of topic	April
Meeting supervisor	April, May, and June
Development of research problem	April
Collection of data	April and May
Analyzing data	June
Preparation of report	June
Submission of report	July

APPENDIX B

ACTUAL RESEARCH BUDGET

ACTIVITY	ITEM	COST(UGX)	TOTAL COST(UGX)
1. Visiting Britania Allied Industries Ltd Uganda head offices	Transport for 15 days	2000 x 15	30000
2. Library research	Research for 7 days	1000 x 7	7000
Sub-total(UGX)			37000
1. Stationary	i) Printing services	50 x 50	2500
	ii) 1 Dozen of pens	200 x 12	2400
	iii) Research's bag	2000 x 1	2000
	iv) 2 Boxes of files	400 x 2	800
Sub-total(UGX)			7700
Total (UGX)			44700

APPENDIX C

INTERVIEW GUIDE FOR THE HEADS OF BRITANIA ALLIED INDUSTRIES LTD UGANDA

1. To what extent does materials management affect inventory costs?
2. What measures does Britannia Allied Industries Ltd Uganda enforce in maintaining high inventory costs management in regard to materials management?
3. To what extent does Britannia Allied Industries Ltd Uganda invest its surplus funds on materials?
4. Do you feel that there are any solutions that can help improve materials management in Britannia Allied Industries Ltd Uganda?
5. What are the factors affecting materials management and profitability in Britannia Allied Industries Ltd Uganda?
 - a) Technology b) Effective management c) Globalization
 - d) Deregulation e) Marketing mix
6. How would you rate the contribution of the above factors to Britannia Allied Industries Ltd Uganda materials management and profitability?
 - a) Poor b) Fair c) medium d) good e) excellent
7. What is the management strategies put in place for improving materials management in Britannia Allied Industries Ltd Uganda?

APPENDIX D

QUESTIONNAIRE

My name is Mubiru Ronald, a student at Kampala International University. I'm conducting research on Materials Management and Inventory Costs Management in Organizations, a case study of Britania Allied Industries Ltd Uganda. The purpose of this study is to fulfill my academic requirements. Therefore I kindly request you to answer for me the following questions:

Note: Your responses will be treated with the highest degree of confidentiality.

Background information:

Please tick the most appropriate box

1. Age

- | | | | |
|----------|--------------------------|-----------------|--------------------------|
| a) 18-25 | ☐ | b) 26-35 | ☐ |
| c) 36-45 | ☐ | d) 46 and above | ☐ |

2. Sex

- | | |
|-----------|--------------------------|
| a) Male | ☐ |
| b) Female | ☐ |

3. Marital status

- | | |
|------------|--------------------------|
| a) Married | ☐ |
| b) Single | ☐ |

4. Level of education qualification

- | | | | |
|-----------------------------|--------------------------|--------------------|--------------------------|
| a) Primary level | ☐ | c) Secondary level | ☐ |
| b) Professional certificate | ☐ | d) Diploma | ☐ |

5. Departments

- | | | | |
|--------------|--------------------------|-------------------|--------------------------|
| a) Education | ☐ | c) Administration | ☐ |
| b) Health | ☐ | d) Finance | ☐ |

OTHER QUESTIONS

1. How do you find materials management and inventory costs management of Britania Allied Industries Ltd Uganda?

- a) Clear ☐
- b) Not clear ☐
- c) None ☐
- d) Others (specify).....

2. How long does it take materials to get finished in the stores of Britania Allied Industries Ltd Uganda?

- a) Instant ☐
- b) A day ☐
- c) A week ☐
- d) A month ☐
- e) None ☐
- f) Others (specify).....

3. What are the techniques used for materials management in the stores of Britania Allied Industries Ltd Uganda?

- a) Just in time technique ☐
- b) Two-bin system technique ☐
- c) Others (specify).....

4. Do inventory costs management always match with the materials management?

a) Yes ☐

b) No ☐

c) Others (specify).....

5. Does materials management affect inventory costs management?

a) Yes ☐

b) No ☐

c) Others (specify).....

6. What are some of the obstacles experienced as a result of materials management in
Britania Allied Industries Ltd Uganda?

.....
.....
.....

7. What are some of the solutions to the problem in question (9) above?

.....
.....
.....

Thanks