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Information technology as way of controlling inventory cost in the timber industrya case study of Ghana specialized timber products limited, Kumasi

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DOI: https://doi.org/10.33545/27076636.2022.v3.i2a.64

Abstract
This article addresses the use of Information Communications Technology to regulate inventory cost. A large portion of an organisation funding kept in stores is the inventory. Inventory is acompany's raw materials, finished and unfinished products which have not yet been sold. The profit made by any organisation is directly proportional to inventory cost incurred.
A lot of timber organisations have poor system ineffective control and management of inventory. The researcher find inventory to be an area for savings and cost reduction. There have similar research in the timber area but within different geographical areas like Takoradi which also focuses on the employment of Information Communications Technology to assist the industry's growth.
This paper seeks to have a thorough study in the Inventory Control System in Ghana Specialized Timber Products Limited, providing necessary measures for cost reduction in Inventory and additionally to suggest proposals to management of the firm to assist, control and manage inventory in relation to cost. The researcher employed questionnaires, personal interviews, documenting materials, informal discussion, general observation and reference from library records on related literature as the methodology for this article.
From the study the researcher found out that there were not enough stores location and lack of identification system exist within the industry. Additionally the absence of in-service training for staff of the firm also contributed to the lack of control and management of inventory.
The implication of the above findings is that if this situation is not remedied, production will go down. The company's loss is as result of inadequate storage facility and bad identification system.

Keywords: industry, inventory, Specialized, Products, Limited, information technology, cost, timber, Kumasi, controlling

Introduction
1. Background
The purpose of this chapter is to give the background of the work and introduce the subject matter of the project. Inventory, including all items kept in stores represent a large proportion of an organisation working capital. Inventory is a company's raw materials, finished and unfinished products which have not yet been sold. Any cost incurred significantly affects the profitability of the organisation. For that matter, Inventory or stock must be given the due attention for management. It is therefore good to critically research into the way and manner inventory are managed and controlled. Probably this will ensure all possible loopholes and shortcomings as faras Inventory management is concerned are rectifiedandre-adjusted for the benefit of cost minimization and profit maximization. The researcher therefore chose information technology as an area of study because of its related benefits with regards to inventory management.

1.1 Statement of the problem: Inventory kept in an organisation constitutes about a substantial portion of the organisation's working capital. Inventory has proved to be a potential area for savings and cost reduction. Most timber organisations have poor system ineffective control and management of inventory. The researcher finds it laudable to investigate into how information technology could be adopted to assist, control and manage inventory in relation to cost. That is why the researcher finds it laudableto choose aprojecttopicin Information technology as away of reducing Inventory cost.

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1.2 Purpose and objectives of the study

Like any study, the researcher has objectives to achieve. The following are the objectives of the study:

TohaveathoroughstudyintheInventoryControlSysteminGhan aSpecializedTimberProductsLimited, providing necessary measures for cost reduction in Inventory,

To recommend to management, proposal and all the necessary policies could be adopted to assist, control and manage inventory in relation to cost. That is why the researcher finds it laudable to choose a project topic in Information Technology as a way of reducing Inventory cost.

To highlight on all possible loopholes and drawbacks that contributes to the high cost associated with Inventory control. The researcher deemeditvery important because as the problem is clearly identified, half of the problem is solved.

1.3 Significance of the study

The study is intended to offer benefits to people as well as many other areas. The following below can be seen as the list of various beneficiaries: The study as an article helps the researcher to fulfill the Information Communication Technology requirement of accounting professionals. Also, the researcher will personally acquirene wandup-date knowledge in the course of the research. These knowledge and new information is acquired from references from books, intervie ws visual witness sand many others. Ghana Specialized Timber Products Limited being the case study will also benefit from the study. This is because it is intended to solve a problem that is said to be present in the organisation. There commendations and proposal by the researcher will serve as a solution to problems encountered in the organisation. Interested students could make references to it for possible directions and tuition.

1.4 Limitations of the study

Like any other research, the researchers experience various drawbacks. These are some of the workers as well as managers were reluctant to provide certain vital information which they termed as confidential and must be treated as such. Although some workers were willing to give out vital information they were hindered by what they call time constraint. Many workers find the mselves doing something almost every minute. Again, staff members and even some of the managers were not much aware of the essence of the research. The researcher's presence there to them, is to tap information that might go long way to affect the organisation. They were cautions in providing delicate information, which could be helpful. There was time constraint having to combine academic work and the research within the stipulated period was a difficult task. Finally, the researcher experienced difficulties in terms of financing, transport fares and other expenses in relation to the research was gradually becoming unbearable.

2. Chapter two literature review

The purpose of this chapter is to review the ideas of various writers, with respect to managing inventory and its associated costs as well as information technology. This review will throw more light on the issues that had to do with materials flow in an organisation and how information technology can help to address these issues. For the purpose of this chapter, the review will focus on the following:

1. Definition of Inventory
2. Types of Inventory
3. Significance of Inventory
4. Managing Inventory cost
5. Information and data
6. Significance of information
7. Information systems
8. Information system development and design
9. Information Technology Defined
10. Functions of Information Technology
11. Implications for adopting Information Technology
12. Information technology and inventory management

2.1 Definition of inventory

Many writers have come out with various definitions of inventory. David Lowe defines Inventory as goods in stock or the contents of a building. He emphasised the fact that inventory management is one of the key functions within the organisational activities Stock is critical to the survival of a company, it influences the company's ability to provide. It otherwise consumes.

Chase, Aquilano and Jacobs in their book Operations management for Competitive Advantages defines inventory as the stock of any item or resources used in an organisation. An inventory system is the set of policies and controls that monitors the level that inventories should be maintained, when stock should be replenished and how large an order should be.

From the various definitions quoted, it can be clearly seen that, inventories are various items that are kept or held for operational and other relevant purposes in an organisation. Organisations such as Timber Firm should inventories to ensure smooth operations and activities.

2.2 Types of inventory/ stock

Different kinds of inventory are held for various reasons. Even though, there may exist others, the following are the various types of inventories: Raw materials, components and packaging stocks.

2.2.1 In-processproducts
2.2.2 Finishedproducts
2.2.3 Pipelinestocks
2.2.4 Generalstores
2.2.5 Spareparts

The above mentioned types of inventory are further broken down to include the following:

Working stock

This type of stock is likely to be a major element of stock found in Distribution Depots. It must the re fore reflect actual demand for the product.

Cycle stock

This makes reference to the major stock for production with in a production warehouse and it reflects the batch size or production run length of the warehouse and it reflects the batch size or production run length of the manufacturing process.

Safety Stock

This can also be called buffer or emergency stock. They are kept to cover. This can unplanned or unpredicted fluctuations in demand.

Speculative Stock

This can be a raw material that is bought forward for financial or supply reason ora finish stock that are planned in advance to prepare for delivery.

Seasonal Stock

These are stockpiled to give room for expected large increase in demand. They include inventory built up prior to the Christmas demand pack.

2.3 Significance of keeping inventories

Inventories prove to be necessary recipe in achieving company's Overall objective. They tie up the greater part of organisations working capital. There is therefore the need to ensure efficiency control and management of inventories. The following are a list of various reasons for keeping inventories;

2.3.1   To keep production cost down
2.3.2   To accommodate variation in demand
2.3.3   Totakeac count of variable supply (lead time) times.
2.3.4   To reduce buying cost, that is to take advantage of economic order quantity (EOQ)
2.3.5   To obtain quantity discounts
2.3.6   To account for seasonal fluctuations
2.3.7   To allow for price fluctuations/speculations
2.3.8   To smooth production and Distribution operations
2.3.9   To allow for prompt response to customer orders
2.3.10 Tominimize,productionsdelays,causedbystock-outofmaterialcomponentsasamaterialpart   of   the production process (cooling of material)

2.4 Inventory cost management

A part from the buying cost, the holding of stock necessarily involves what are known as inventory cost. It can be broadly categorized in to three:

Ordering/Replenishment Cost

These are made up of transport, clerical and administrative cost, associated with the physical movement of bought in external goods. However, where the goods are manufactured internally to the organisation these are alternative initially cost to be borne with each production run known asset-up cost.

Holding/Carrying Cost

This represents the cost associated with holding or carrying the materials within the organisation. They include the following;

1.   Store   Costs-They   include   staffing,   equipment, maintenance Handling
2.   Storage Overheads-including Heat, light, rent
3.   Cost associated with capital tied up in inventory
4.   Insurance, security and pilferage
5.   Deterioration and Breakage

Stock out Cost

These are cost sometimes not easily quantifiable associated with running out of stock. These include; Payments of penalty Loss of good will (If possible affecting number and size of future orders) idle manpower and machines, etc. Of course one of the main reasons why inventories are held to avoid just such cost. The cost associated with inventory could not be entirely eliminated or do away with.

Organisations have options to control inventory cost. These measures refer to as the inventory control system.

2.5 Inventory control systems

There are basically two standard systems for controlling inventory cost.

Re-order level system

For each item, this system sets a fixed quantity of stock (Normally EOQ) that is ordered every time the level of stock meets (or falls below), the calculated order level. This system set the value of three important levels of stock as warning oraction triggers for management.

1.   Re-Order Level System: This is an action level of stock, which cause a replenishment order (EOQ) to be made.
2.   Minimum Level: This is warning level set such that only in extreme cases should it be breached.(That is above average demand or late replenishment)
3.   Maximum Level: This is another warning set such that only extreme cases (that is how level of demand) should it be breached. The above control system must be considered appropriately with regards to situation a and, to ensure cost effectiveness, customer services and profitability.

2.6 Data and information data

These are simply raw fact, figures and details. They are facts or numbers collected, for examination and consideration and used to help decision- making or they can be facts figures and details that can be stored and process by a computer. Data is essential tool in the controlling of inventory cost.

Information

This is defined as an organized meaningful and useful interpretation of data. This information if managed efficiently and effectively presents various advantages to stock control.

Chapter three
Methodology
3. Introduction

This chapter describes how research was conducted or how the problem was investigated. It shows how data will be collected and the various ways of analyzing the data. The specific information and data collected will enable the researcher come out with a complete work on information technology.

3.1 Methods used in collection of data

Data were collected from various sources which include: Questionnaires, Personal interviews, informal Discussion, General Observation, Documenting Materials and Reference from library Records on related literature.

3.1.1 Questionnaires

To enable the researcher obtains in for motioned necessary facts on the topic.20-itemed questionnaires were sent personally to the Purchase Department and staffin the stores Department. The researchers first explained the objectives and the purpose of the research to the various respondents. They in return accepted the questionnaires after convinced answers were offered to their questions. The main objectives of the questionnaires was to enable the researcher obtain

necessary response from the various respondents, if possible analyzed them.

3.1.2 Personal interview
The researcher used these techniques to obtain facts about facilities and structures which would have been difficult to obtain, if other method used. Firsthand information as well as personal information, which are necessary to the work, was gathered by the use of this method. Although, the researcher faces difficulties sometimes with certain respondent this method was a good one.

3.1.3. Informal discussions and observations
The researcher again used this method to obtain information and facts, which would have been difficult to obtain if other method used. This was based on how the stores function relates its activities to the use of information technology; it was also based on the staff member's attitudes towards the use of information technology in stores activities.

3.1.4 Documentary materials
The researcher was engaged in extensive use of available documents on information technology to obtain data and fact for his work. The material was in the form of information technology material.

Library records
The researcher also made reference from the library. This method also provides the necessary information and fact for the completion of this work.

Sampling method
The sampling was done randomly. Random sampling method was used because it is a procedure in which all members of the staff in the organisation have the equal chance of been selected orchosen.

Methods of analyzing data
Descriptive Approach was adopted as a method of analyzing various data. These statistical tables were drawn based on the percentage, corresponding to absolute figures. They were prepared after the answered questionnaires had been edited and tallied. Therefore percentages were used tocomeoutwithfindingabouttheresearchtopic.Inthenextchapte rallresponsetothequestionnaires or interviews guide will be detailed and presented. This will give reflection on the information gathered.

3.2 Model for testing research questions
Sample percentage, were used as a model for testing the research questions. The model is presented as:

FORMULA=OUTCOME X100

Analysis of the data collected. It includes detailed discussions and presentation of responses to the questionnaire. The questionnaire was administered to both management and staff of the Ghana Specialized Timber Products Limited and the response rate was 100%. The table below contains responses about the information technology related questions which was obtained through questionnaires administered.

Table 4.1: Analysis of information technology related quest

Number of Questions	Yes	No	% Yes	% No
1. Does management organizes educative programmer concerning the need for implementation of information technology?	10	0	100	0
2. Has the organisation put in place the appropriate management information system?	10	0	100	0
3. Is the storehouse and other storage areas computerized?	9	1	90	10
4. If yes, is there an appropriate installation of software programs that meets the requirements of the organization?	9	1	90	10

From table 4.1, questions related to information technology were analysed and interpreted. The analysis was carried out based on responses in percentages. From the table (4.1), it was observed that the entire organisation recognized that information technology play an important role in controlling or managing cost in inventory. None of the respondents answered negatively for that matter, thus the researcher score 100% for that. Furthermore, when asked whether or not management organizes educative programmes concerning the need for the implementing information technology. All the respondents answered yes. This means that all the respondent sans were d positively to the question. Again, further question was asked whether or not

the organisation have in place the appropriate management information system (MIS). 100% of the respondents answered yes. This means that all respondents think the system is sufficient. The researcher again enquired from the respondents whether or not theM3rohousa and other storage areas are computerized. In response 90% answered Yes to the question. Only one person thinks that although all the storage areas are computerized, there are not appropriate software maintenance staff that will meet the needs of the organisation.

The table below contains information on responses on the analysis of inventory control and management.

Table 4.2: Analysis of inventory control and management related questions

Number of response	Percentages (%)			
Questions	YES	NO	YES	ON
1. Does the organisation have the requisite inventory control system?	8	2	80	20
2. Does the organisation have policies andprocedurestoensurestandardofperformancewithregardstoinventory Management?	10	-	100	-
3. If Yes, does management really ensure its enforcement?	7	3	70	30
4. Does the organisation have an independent section responsible for control and management of inventory?	8	2	80	20

Data response class

Outcome: Number of Responses in Each Case Response Class: The total number of respondents

Chapter four

Analysis of data introduction

This chapter contains the

From the table 4.2, all questions relating to inventory control and management were analysed and interpreted. The analyses were carried out based on responds in percentage.

From the table (4.2) the respondents were asked whether or not the organisation has the requisite inventory control system. 80% of the total respondents answered "Yes". The other 20% think the organisation has no requisite inventory control system, therefore answered 'No'. The researcher further asked, if the organisation has policies and procedures to ensure standard of performances with regards to inventory management. The entire respondent answered, "Yes This means the yall think that the organisation has policies and procedures in controlling and management of inventory.

Again the respondents were asked, if they're all saying Yes' does management really ensure the enforcement of these policies and procedures.70% out of the total respondent answered Yes" whilst the other 30% responded "No". This means less of the total respondents numbered believed that although there exist policies and procedures with regards to inventory management and control, they are not enforced.

Finally, the researcher asked whether or not the organisation has an independent section, which is responsible for controlling and management of inventory control and management. In response80% believed that, there is no formal section responsible for inventory control and managementwhilst20%of the respondent answered 'No' to the question.

The table below contains information on responses on the analysis or inventory control and management.

Table4.3Analysesofgeneraloperationalquestions

Number of response			Percentage (%)	
Questions	YES	NO	YES	NO
1. Does the organisation have the appropriate stores location and coding system?	7	3	70	30
2. Does the organisation have proactive security and safety	8	2	80	20
3. Measures in the store house and other storage areas?				
4. 3Does production planning and schedules Coordinates or integrates the activities of the store function?	9	1	90	10
5. Does the organisation key supplier sal ways ensure right first time deliveries?	5	5	50	50
6. Is the organisation prepared to accept and implement any changes in the way inventory are controlled and managed?	10	-	100	-

From the table 4.3 all questions relating to the general operational questions were analysed and interpreted. The analysis was carried out based on responses in percentages.

The values from table 4.3.1 suggests that the organisation have appropriate store location and coding systems for their operations because out of the total responses only 30% think there is in appropriate store location and coding system in the warehouse.

Furthermore, the researcher enquired from the respondents if the organisation has proactive security and safety measures in the store house and other storage areas. Out of the total respondent, 8 out of 10 which represent80% of the total number think there is pro-active security and safety in the warehouse and other storage areas. Meanwhile 2 out of 10 which represent 20% of the outcome think even though the organisation has security and safety measures in the warehouse and other storage facilities, the measures are not all that pro-active. Firstly with the views of some of these workers, they think there is still some data loss which affects the organisation. Even though most information is stored on computers, there are still some information like receipts which are still kept on papers. These are being destroyed by mice and cockroaches which serve as future reference in cases of future reference.

Moreover, security is not all that pro-active because some of the workers take vital information about the organisation to the outside world. Some of the workers are being paid by their competitors to feed them with information about the organisation.

In every organisation, in as much as production is the priority, the safety of the workers should be given much attention. Even though workers are advised to put on personal protective equipments (PPEs), some complain it is difficult to hold items with PPEs like the gloves. Some of these workers get hurt in the process and it increases the cost of the organisation. Once these workers get hurt, there is shortage of labour which affects overall production.

Do production planning and schedules co-ordinates the activities of the store function. With the total outcome, 9 which represent 90%of the respondent said there was co-ordination of activities of the store function. One out of the outcome which represents 1% said even though there is maximum co-ordination, there is sometimes break in communication. This is because some workers have personal problems which they bring to work site.

Again the researcher enquired whether or not the organisations key suppliers always ensure right time delivery. Half of the outcome which represents 50%wasof the view that there was right time delivery. The other half which represented50% of the response said deliveries were sometimes not on time. They said firstly that, there were sometimes machine breakdown. Also, there are certain times in which the demand on the market is very high that the company cannot meet these demands on time. Moreover, in transporting these goods, there are several breakdowns of the vehicles on their ways which take longer time before they are repaired and all of these contribute to late deliveries.

Finally, the respondents was asked whether or not the organisation is prepared to accept and implement changes in the way inventories are controlled and managed. With the outcome, the response was positive as all of them responded to the fact that they were prepared to accept and implement change. This they said was because there would be easy

access to data and also information could be kept very safe with the use of information technology facilities.

Chapter five Summary, conclusions and recommendations

5. Introduction

This chapter presents the summary and draws logical conclusions and proposes recommendations in the control of inventory cost.

5.1 Summary of findings

The researcher, in the course of the study revealed certain findings. These findings have been summarized below:

1. Inadequacy of the information technology system (Computers and Accessories).
2. Inadequate stores location and identification system.
3. Lack of in-service training there is lack of training and education for personnel responsible for the control and management of inventory.
4. Ghana Specialized Timber Products Limited although have instituted policies and procedures, do not ensure its effective enforcement and implementation.
5. Finally, the researcher realises that the organisation does not integrate and coordinate activities of production schedules with that of stores function. This resulted to lack of communication between these two important functions.

6. Conclusions

The above findings cannot be overlooked if Ghana Specialized Timber Products Limited would be making ahead way. The researcher in her own opinion concluded the research work based on the certain criteria. Inadequacy of the information technology system - The world as we now see to be is growing at a faster rate and this makes us to see the whole as a global village. The use of computers and other accessories is what is found to be lacking at Ghana Specialized Timber Products Limited. It is clear that if this situation is not remedied, decrease in production is likelytobetheoutcome.Inadequatestoragefacilityandimproper identificationsystemarealsosomeof the draw backs of the company's operations. There is the need for Ghana Specialized Timber Products Limited to install more storage facilities to enable them house their raw materials andfinishedgoods.Itwasalsoseenthattherearenopropersystem sofidentifyingstocksandother materials in the warehouse. This makes it difficult to retrieve certain materials needed from the store.

Inadequate storage facility and improper identification system are also some of the draw backs of the company's operations. There is the need for Ghana Specialized Timber Products Limited to install more storage facilities to enable them house their raw materials and finished goods. It was also seen that there are no proper systems of identifying stocks and other materials in the warehouse. This makes it difficult to retrieve certain materials needed from the store. Furthermore, lack of in-service training was found out to be causing a decrease in the production levels of Ghana Specialized Timber Products Limited. It was found out that personnel lack there quisite training to help them work more effectively. Training of staff and other personnel for the control and management of inventory is not done.

5.3 Recommendations

Based on the findings obtained from the research, the researcher wish to propose following recommendations as a way of helping the organisation to improve its operations.

● Information Technology

TheresearcherproposedthatmanagementofGhanaSpecialized TimberProductsLimited must acquire enough information technology systems, the following systems are suggested by the researcher

• Computer Integrated Management (CIM)
• Computer Aided Design (CAD)
• Computer Aided Management(CAM)
• Electronic Data Interchange(EDI)
• Electronic Point of Sale(EPOs)
• The organisation must ensure that it acquires computer hard ware and it accessories.
• Finally, the organisation should consider the designing of a customized Software programs
• Stores Location Systems The following should bead hered to:

All shelves and bins in all storage areas must be identified with numbers and alphabets where appropriate. This information must be recorded into the computer. Ghana Specialized Timber Products Limited should also design an appropriate coding system. The researcher proposes the following methods of coding: by nature, by end use, by colour, by technical spares, bar coding, code39 interleaved 2 of5, UPCIEAN.

• **Policies and Procedures**

It is laudable that the organisations establish policies and procedures to govern inventory control and management. There searcher therefore suggests that these policies and procedures be enforced and implemented throughout the organisation. That is from top management to the shop floor workers.

• **Training and Education**

The management of Ghana Specialized Timber Products Limited should institute training and educative programs for the workers especially the unqualified ones. Training could be in the form of: organizing workshops, educative meetings, in services training and soon.

• Production and Stores Function

The researcher finally proposes that the production planning and schedules must be integrated and coordinated with the stores function. There must be joint planning and sharing of timely information. This will help improve communication and efficiency in the activities of both functions.

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