ST. MARY'S UNVERSITY

SCHOOL OF GRADUATE STUDIES

DEPARTMENT OF BUSINESS ADMINISTRATION

ASSESSMENT OF WAREHOUSE PERFORMANCE:

A CASE OF META ABO BREWERY SHARE COMPANY

BY

KALKIDAN ALEMAYEHU

MAY, 2018
ADDIS ABABA, ETHIOPIA

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A THESIS SUBMITTED TO ST.MARY'S UNIVERSITY SCHOOL OF GRADUATE STUDIES IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION

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APPROVED BY BOARD OF EXAMINERS

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DECLARATION

I, the undersigned, declare that this thesis entitled "*Assessment of Warehouse Performance: A Case of Meta Abo Brewery Share Company*", is my original work and to the best of my knowledge has not been presented for a degree by any other person, and that all the sources of material used for the thesis have been duly acknowledged.

Declared by:

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BUSINESS ADMINISTRATION

STATEMENT OF CERTIFICATION

This is to declare that the thesis is prepared by Kalkidan Alemayehu, entitled: *The Assessment Of Warehouse Performance: A Case Of Meta Abo Brewery Share Company* administration of St. Mary's University school of Graduate Studies in partial fulfilment of the requirements for the Degree of Master of Arts in Business Administration with the regulations of the University and meets the accepted standards with respect to originality and quality.

Advisor: Mohammed Mohammednur (Ass.Prof)

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Date & Signature

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ACKNOWLEDGEMENTS

LIST OF ABBREVIATIONS AND ACCRONYMS

ANOVA	Analysis of variance
CI	Cost Indicator
JIT	Just in time
MABSC	Meta Abo Brewery Share Company
MRP	Material Requirement Planning
PI	Productivity Indicator
QI	Quality Indicator
ROP	Reorder Point
ROP	Return on investment
TI	Time Indicator
WMS	Warehouse management system
WP	Warehouse Performance
5s	Five "S"/Sort, Set, Shine, Standardize, & Sustain/

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ABSTRACT

This study aims at contributing to the current trend on assessment of warehouse performance specifically on Meta Abo Brewery Share Company. Following from years of warehouse management performance in Meta Abo Brewery Share Company, the warehouses were engulfed with poor warehouse performance. It was against this background that the research was carried out, to assess the warehouse performance at Meta Abo Brewery Share Company as a case study. Considering this reality, this particular study assess the warehouse performance (measured in terms of the most frequently used four dimensions as suggested by Edward Frazelle (2001), namely Quality, response time, total warehouse cost, and productivity in the company called Meta Abo Brewery Share company. The study adopted a qualitative and quantitative mixed method research approach. To achieve this objective, the researcher uses a self- administered questionnaire with a Likert scale on the four basic warehouse performance variables. The researcher also used both secondary and primary gathering tools. Since the total population less than 100 the researcher took all population for the study with census method. The study employed descriptive research design in assessing warehousing performance of Meta Abo Brewery Share Company. Questionnaire were sent to a total of seventy warehouse personnel worked in three warehouse branch ,who gave their views on various warehousing performance in accordance with how such performance impacted or influence their work. Further evidence from the warehouse personnel showed that there was poor utilization of existing warehouse space in MABSC. Again it was drawn from the findings that not having well equipped warehouse system to handle the warehouse materials and this adversely affect the Meta Abo Brewery Share company warehouse performance in terms of quality, cost and productivity. The study made some recommendations to Meta Abo Brewery Share Company.

Key words: - Warehouse performance, Key performance Indicators

CHAPTER ONE

INTRODUCTION

1.1. Background of the Study

Logistics management is one of the most important activities for many companies. According to the Material Handling Institute of America (MHIA 2007), the mission of logistics is to achieve efficient flows of materials and information over the entire supply chain (logistics network), which consists of the physical and communication paths connecting multiple, inter-related businesses from their points of origin to the final end consumer. In a typical supply chain, raw materials are procured; items are produced at one or more factories, shipped to warehouses for intermediate storage, and then shipped to retailers or customers. Warehouses play an important role in a supply chain, as products need to be put somewhere along the supply chain for temporary storage before reaching the end user. (Simchi-Levi et al. 2000)

Warehouses are a substantial component of logistic operations, and an important contributor to speed and cost in supply chains. While there are widely accepted benchmarks for individual warehouse functions like order picking, little is known about the overall technical efficiency of warehouses. Lacking a general understanding of warehouse efficiency and the associated causal factors limits organizations ability to identify the best opportunities for improving warehouse performance. This study addresses this gap by describing a methodology for assessing warehouse technical efficiency based on empirical data integrating several statistical approaches. This study also identify several opportunities for additional research on warehouse assessment and optimization. (Leon Mcginnis, 2010*).*

A warehouse is a commercial building for buffering and storage of goods, or an intermediate area for storage of raw materials or products until they are needed for production or consumption. Warehousing is an essential component for most businesses and government organizations. In any Supply Chain, Inventory Management and Warehousing form a part of operations intensive function and is one of the key building blocks in the entire chain and the efficiency of the warehouse operations will determine the further supply chain efficiency.

Warehouses are used primarily by manufacturers, exporters, importers, wholesalers and transport businesses. A warehouse refers to a commercial building that serves as a storage place for goods. The warehouses are usually large plain buildings in industrial areas of cities and towns and are fully equipped with loading docks, cranes and forklifts among others.(Simchi et al, 2000)

Warehousing is costly in terms of human resources and of the facilities and equipment's required, and its performance will affect directly on overall supply chain performance. Inadequate design or managing of warehouse systems will jeopardize the achievement of required customer service levels and the maintenance of stock integrity, and result in unnecessarily high costs. .(Simchi et al, 2000)

According to Ilieş Liviu, Turdean Ana-Maria and Crişan Emil Babeş, (2009) – A Case Study on Warehouse Performance Measurement states that Companies could gain cost advantage using their logistics area of the business. Warehouse management is a possible source of cost improvements from logistics that companies could use during this economic crisis.

The Ethiopian Federal Ministry of Health (EFMOH) has been working to ensure an efficient and high-warehouse performing healthcare supply chain that ensures equitable access to affordable medicines for all Ethiopians. Recently, significant progress has been made, although various challenges remain, including an inadequate supply of quality and affordable essential pharmaceuticals, poor storage conditions, and weak stock management, which has resulted in high levels of waste and stock outs. (PFSA, 2007)

In this case study warehouse performance measurement which lead to performance improvements. Their solution of Warehouse performance measurement refers to the measurement of: optimal use of storage space, customer relations activity, quality level, assets usage and costs. Conducting warehouse activities is not as such simple as traditionally known sets of warehouse activities like receiving of stocks, hold them and issue when they are needed rather understanding of warehouse efficiency and the associated factors that affects the ability of warehouse performance and meets the maximum service level provided by the company. (Per Axelsson & Jonathan Frankel 2014)

Performance measurement, will give the reader a brief insight to the importance of performance management and performance measurement. (Per Axelsson & Jonathan Frankel 2014)

Warehouse management, explains the meaning of warehousing operations, Warehouse management and warehouse management systems (WMS). It summarizes general warehouse

processes, warehouse types, warehouse trade- offs, trends and challenges. The purpose will to provide an understanding about warehousing, furthermore, it will gives an understanding of the classification of metrics in warehousing, thereby it also works as a basis for the study as well as the analysis. (Jonathan Frankel 2014)

The main aim of assessing the warehouse performance will therefore be for the warehouse to fulfill its functions with economy, speed and efficiency. A logical layout will help. This should be designed to suit the types of goods in store and the patterns in which they are received and issued. Storage location systems will enable orders to be put together and made ready for distribution when they are wanted (Geneva, 1991).

Performing KPIs analysis is very critical in any organization to better understanding their performance and previous decisions accuracy. Unfortunately not many organizations understand its importance and ignore performing this step. Improvement in KPIs due to applying relational analysis and transforming quantitative measure to qualitative indicators which makes senior management understand previous decision taken and how accurate it was, and hence improving future decisions and hence performance results. (Hanaa El, 2013)

Although there has been work on warehouse performance, as student researcher there hasn't been much work done in the area. The reason for judgment is that most long essays are on warehousing activities, but there is no thesis on assessment of warehousing performance, so the student researcher has cover most of the areas that were not covered. Hence, the student researcher ambition is to conduct a thorough research in the area of assessment of warehousing performance in the Meta Abo Brewery Share company as a case studies.

In this research paper, the researcher has look at the concept of warehousing and its performance according to the theoretical and practical perspective of the warehouse performance in Meta Abo Brewery Share Company. The student researcher conduct this study to get an insight of the warehouses performance from quality, time, cost, and productivity aspect.

1.2. Statement of the problem

Warehouses are a substantial component of logistic operations, and an important contributor to speed and cost in supply chains in Meta Abo Brewery Share Company. While there are widely accepted benchmarks for individual warehouse functions like order picking, little is known about the overall technical efficiency of warehouses. Lacking a general understanding of warehouse

technical efficiency and the associated causal factors limits industry's ability to identify the best opportunities for improving warehouse performance.

Assessing warehouse performance has been largely ignored in research literature. Performance measurement and metrics have also been considered to be a complex matter, and operating the measurements is often inadequately understood followed by weakly formulated definitions of what will be measured (Swink, 2004).

Warehousing performance indicators of Meta Abo Brewery S.C in Addis Ababa and up country has been a source of disquiet and concern to the major production area in the brewing company found in SEBETA. Especially during the peak of the Brewing season that is from April to December every year the cost, time, quality and productivity of each warehouses has been going up and downs due to high warehouse operational movements.

In order to solve the above problems, the company, in providing warehousing has to ensure enhancement in its operations. The question then is what are the key performance indicators on warehouse performance? This study, using Meta Abo Brewery Share Company as a case study tries to find out how an efficient warehousing performance indictors (Quality, time, cost and productivity) is relevant to the overall warehouse operations of all Meta Abo Brewery S.C.

Effective assessment of Warehouse performance can potentially affect the overall supply chain activities of the enterprise and directly contributed to the productivity of the company as a whole. However MABSC currently is not able to effectively assess the performance of the warehouse to know where to improve it and .to maintain better performance performed by the company. (Source; Preliminary interview)

Warehouse constitutes the most significant part of current supply chain management in the company. Because of the nature of the business and considerable sum of an organization's fund is being committed different products. The current low and decline in sales as well as the poor distribution system of the company had contribute a lot to the significant gap/problems in relation to warehouses performance. This practice becomes imperative to manage warehouse effectively so as to avoid unnecessary cost which is currently high and unmanageable.
Moreover, the new productivity concept of the company which is not a trend of the company before, and to ensure a high level of customer service which a gap in the company are also other additional gaps.(Source; Company Bulletin, 2014)

Considering the aforementioned gaps, this study attempted to determine the status of warehouse performance in Meta Abo Brewery Share Company along the four most frequently used warehouse key performance indicators, namely Quality, response time, total warehouse cost/financial, and productivity as suggested by (Edward Frazelle, 2001)

1.3. Basic Research questions

In view of the aforementioned problems, this particular study had been attempted to answer the following basic research questions:

- What is the current practice of warehouse performance in MABSC?
- Which key performance indicator the company performs better?
- What is the perception of the employees of the company on the key performance indicators?
- What are the Key performance indicators on the warehouse performance?

1.4. Objective of the study

1.4.1 General objective

The general objective of this study was to examine the status of warehouse Performance in Meta Abo Brewery Share Company.

1.4.2 Specific objective

i. To determine the current practice of warehouse performance in MABSC.

ii. To identify the major key performance indicator that performs better.

iii. To know the current perception of each employee on the key performance indicators.

iv. To evaluate the key performance indicators of the warehouse performance.

1.5. Definition of Basic terms

Quality

Quality is really about poor quality, including the defects, deficiencies, rework, fix and repairs, frustrations, customer complaints, late deliveries, decline promises, low morale at work, and wasted time, energy and money. Quality control teaches us how to restrict the effects and occurrences of these things (Madhav Sinha, 2010)

Time

The indefinite continued progress of existence and events in the past, present and future regarded as a whole (Oxford Dictionary). In case of warehouse time refers to fast and speedy delivery and movement of materials just on time.

Cost

An amount that has to be paid or given up in order to get something. In business cost is usually a monetary valuation of (1) effort (2) materials, (3) resources (4) time and utility consumed (5) risks incurred, and (6) opportunity forgone in production and delivery of goods or service. (dictionary.com, 2011). Cost in warehousing refers to the total cost incurred in a given warehouse example a cost incurred on renting warehousing, cost for loading and unloading personnel's and any associated costs with warehousing.

Productivity

In business, a measure of worker efficiency, such as one hundred units per hour. In economics, involvement in the creation of goods and services to produce wealth. (A.k Datta, 2000). Productivity in warehousing refers to space utilization of warehouses and stacking heights of the storage which have an immediate impact on costs.

5S

The 5S Method is a standardized process that when properly implemented creates and maintains an organized, safe, clean and efficient workplace. Improved visual controls are implemented as part of 5S to make any process non-conformance obvious and easily detectable. 5S is often one element of a larger Lean initiative and promotes continuous improvement. (Gunasekeran, 2001). This concept in warehouse refers to sorting documentations/bottling, shining every handling materials and office equipment, standardized the overall working process. Moreover, setting in best order of all materials and sustain the best practice of each warehouse is also part of the 5s in the warehouse.

Warehouse Performance

Warehouse performance means creating a measurable improvements in the activities that take place in warehouse.

1.6. Significance of the study

The study is of much significance on the grounds that the Meta Abo Brewery Share company would be able to make a lot of savings through the adoption of an efficient warehouse management and performance, which could be used to develop other equally important areas of the industry.

Again this study is highly useful because, with the continuous increase in the yearly output of Meta Abo Brewery Share Company and the critical role of warehousing in the warehouse performance it is believe that this study addressed the warehousing key performance indicators that are experienced by the Meta Abo Brewery Share Company.

It is anticipated that the findings and recommendations of the study have been serve as a guide for management, policy makers, regulators and practitioners in the Meta Abo Brewery Share Company. The study was thus harness the monitoring, assessment and review of MABSC warehousing performance with the key performance indicators.

1.7. Scope and limitation of the Study

With regard to limitation of the study, the possible barrier is that a researcher was carry out the study by self-sponsor and non-availability of adequate empirical research in the company. For this reason, an assessment had been undertaken from three decentralized warehouses in Addis Ababa on taking a population 70 staff of meta Abo Brewery share Company rather than covering across Ethiopia.

In terms of scope, the research the effect of warehouse performance in Meta Abo Brewery Share company and the key performance indicators. The study confined to the met MABSC main satellite warehouse and its decentralized warehouses, other warehouses outside Addis Ababa are not included due to financial and time constraints. This research work has been performed only in the warehouse performance perspective.

There is also scope for detailed inspection of the present warehouses to find out the main warehouse problem in the system in order to solve the problems arising from different situations.

1.8. Organization of the study

The thesis has five chapters. The first chapter is the introductions which tell us what the whole research is about. The second chapter is literature review which has the potential to provide the detail of the topic under study, followed by research methodology, which includes the population, sample size, sampling technique, data collection instrument and method of analyzing the collected data. Chapter four is analysis and interpretation of the collected data, and then the last chapter will be conclusion and recommendation.

CHAPTER TWO

REVIEW OF RELATED LITRATURE

2.1 Defining Warehouse

Warehouses are usually large plain buildings used for commercial purposes for storage of goods. Warehouses are commonly used by exporters, importers, wholesalers, manufacturers etc. Warehouses are usually equipped with loading docks to load and unload trucks and they have cranes and forklifts for moving goods, and are placed on ISO standard pallets loaded into pallet racks. (Tompkins & Smith, 1998)

Some warehouses are fully automated where products are moved from one place to other with a system of automated conveyors and automated storage and retrieval machines which run by programmable logic controllers and also with logistics automation software. In an automated warehouse the tracking of materials is coordinated by warehouse management system (WMS), a database driven computer program. Logistics personnel make use of WMS to improve the efficiency of the warehouse by maintaining accurate inventory levels taking into consideration warehouse transactions and directing put ways. (Gwynne, 2014)

Traditional warehousing continuously is declining since the last decade of the 20th century with the introduction of Just in Time (JIT) techniques which are specially designed to enhance the return on investment (ROI) of a business by mitigating in-process inventory. JIT concept is based on delivering product directly from the factory to the retail outlet without the use of warehouse, but in some cases like offshore outsourcing and off shoring in about the same time period, the distance between manufacturer and the retailer increases considerably in many regions which builds the need of at least one warehouse per region or per country for a given range of products in any typical supply chain. (Tompkins S., 1998).

Recent developments in marketing field have led to the development of warehouse designing style, where the same warehouse is used for warehousing and also as a retail store. These types of warehouses are equipped with tall heavy duty industrial racks, with the items which are ready for sale are placed in the bottom parts of the racks and the palletized and wrapped inventory items being usually placed in the top parts. (Johnson, 2008)

Exporters/manufacturers are using warehouses as a point of developing retail outlets in a particular region or country. The above concept cuts down the end cost of the product to the consumer which in turn enhances the production sale ratio. Warehousing concept is used as a sharp tool by manufacturers to reach directly to consumers by avoiding or bypassing importers or other middle agencies. (Tompkins, Smith, 1998)

A warehouse is an essential limb of the industrial unit. It is the depository of all materials required by all industrial units and supplies materials as and when required. The variety of items stored is so large that a planned system is necessary to keep them safely and in order. The stored items should be identified and issued with minimum efforts and in minimum time. This calls for the following:

- An organizational structure suitable to carry on various activities efficiently and productively.
- Defining the functions and duties of each focal official.
- Developing systems for the standardization of operations and uniformity in actions.
- Developing and maintaining records for proper accounting, management information and analysis (Saxena, 2003).

Recent pressures on logistics, increasing customer service levels, inventory reduction, time compression and cost minimization have changed the structure of supply chains and the position and working of warehouses within the supply chains. Warehouses come in all shapes and sizes, from facilities of a few hundred square meters handling modest throughputs, to large capital (Swxean, 2003).

Warehouses exist primarily to facilitate the movement of goods to the end user. Since warehouses, storage and distribution centers should operate as integral components of supply chains, key decisions when setting up such facilities must be determined by the overall logistics strategies for service and cost. Rushton, Alan et al (2000) identify the factors that should be considered in establishing a warehouse to include the following:

i. Market and product base stability – Long-term market expectations for growth and for how the product range may develop will influence decisions on the size and location of a warehouse facility, including space for potential expansion.

ii. Type of goods to be handled – Goods handled can include raw materials, work in progress, spare parts, packaging materials and finished goods. Subject to material types, sizes, weights, product lives and other characteristics, special requirements for temperature and

humidity may also have to be met and all of these will impact on the type of warehouse and technology level.

iii. Type of facility, size and location – The type of operations, design capacity, size and location of the warehouse will all be influenced, if not directly determined, by its specific role and position in the supply chain, and the role, capacity and location of any other facilities in the chain. The customer base, amount of inventory, the need for inventory reduction, time compression in the supply chain and the overall service levels should all be considered when deciding on the type, size and location of the warehouse. (Johnson H.L, 2001)

Warehousing takes up to between 2% and 5% of the cost of sales of a corporation and with recent renewed corporate emphasis on Return on Assets, minimizing warehousing costs has become an important business issue (Rushton, 2000). In today's highly competitive global business environment, many firms are automating their basic warehousing functions to   achieve the increase in throughput rates or inventory turns required for their warehousing operations to be cost effective. At the same time, continued emphasis on customer service exacerbates the quandary of warehouse managers looking for ways to trim costs and improve customer service at the same time (Frazelle, 2001).

2.1.1. Role, purpose and objective of Warehouses

In its most basic form, warehousing is simply holding goods until they are needed. Oftentimes, a distinction is made between finished goods warehouse and a raw materials store room. The fact, however, is that the functions performed in a finished goods warehouse, receiving, storing, picking and shipping, are identical to the functions performed in a raw materials storeroom. Consequently, both are warehouses. The only true distinction between the two the source from which the goods are received and the user to whom the goods are shipped. A raw materials storeroom receives goods from an outside source, stores the goods, picks the goods and ships the goods to an inside user. A finished goods warehouse receives goods from an inside source, stores the goods, picks the goods and ships the goods to an outside user (Rushton et al 2000).

Likewise, an in-process inventory warehouse receives goods from an inside source, stores the goods, picks the goods and ships the goods to an inside user, while a distribution warehouse receives goods from an outside source, stores the goods, picks the goods and ships to an outside user. The differences among these various warehouses are restricted to the perspectives of the sources, management, and user of the goods. If the primary functions of a facility are receiving,

storing, picking, and shipping, then that facility is a warehouse, regardless of its position in a company's logistics. (Rushton, 2000)

According to Rushton et al. (2000), reasons for holding stock and for continuing to have warehouses and distribution depots in supply chains include the following:

- To provide a buffer for smoothing variations between supply and demand.
- To enable procurement savings through large purchases.
- To provide a wide range of different products from different suppliers in one location.
- To cover for planned or breakdown production shutdowns.

The resources of a warehouse are space, equipment and personnel. The usefulness of a warehouse resides in the effective use of its resources to satisfy customer requirements. Customer requirements are simply the demand to have the right product in good condition at the right place at the right time. Therefore, the product must be accessible and protected. If a warehouse cannot meet these requirements adequately, then the warehouse does not add value to the product and in fact very likely subtracts value from the product. Based on the assessments of a warehouse's resources and the customers' requirements, the primary objective of any warehouse management system is to maximize use of warehouse space, equipment, labor, accessibility and protection of all items as well as information. Warehouse space in particular takes up a very significant proportion of total warehouse costs and must be used effectively. Considerations for effective space utilization include:

i. Minimizing total stock-holding and eliminating obsolete stock

ii. Careful selection of appropriate storage and handling systems

iii. Effective use of building height

iv. Minimizing aisle numbers and widths consistent with access and safety

v. Use of random location systems for stock rather than fixed locations (Rushton et al 2000).

The purpose of any warehouse or storage area is to store materials and products of the type and value that users want and in the quantities they need. Materials should be available in stock at the time and place they are required. The reasons for holding materials in stock can be grouped into six main categories: (Guyula, 2013).

(1) To create a buffer stock

Buffer stock is the most common type. This is stock which may be bought from suppliers in large, convenient or economic quantities - by ship or full container load, for instance. It is held in store as a buffer between supplier and user. In this way warehouses try to keep materials in stock which

are needed for production. The aim is to avoid hold-ups between one assembly operation and another.

(2) To create a safety stock Deliveries may be uncertain and demand for materials may be unpredictable.

Delays due to transport or other difficulties may mean the lead time between ordering and receiving goods is long or irregular. A certain quantity of materials is usually held as safety stock to ensure that enough is available for users as they need it. The amount of an item retained as safety stock is often relative to its importance to continuing operations.

(3) To hold insurance stock

Large electric motors in operating machinery or engine blocks may not wear out or need to be replaced regularly. Their sudden failure, however, could cause a major breakdown and replacements would then be a matter of great urgency.

Items like these are held as *insurance stock*.

(4) To store seasonal stock

Storage space is given to commodities which are produced or imported seasonally - maize, rice, millet or wheat, for example. Other supplies which are received in bulk but issued usually over a short season only have also to be accommodated. Seeds and fertilizers are examples of products usually needed at set times of the year.

(5) To accommodate strategic stock

Strategic stocks are local or imported items stored in readiness for a future project. Cement for a planned building project, bitumen for road construction or vaccines for a forthcoming health campaign would all be regarded as strategic stocks. The term *strategic stock also often refers* to inputs and products critical to the needs of core industry or to the health and security of the country. Life-saving drugs would fall into this category.

(6) To hold trading stock

Sometimes large quantities of a product or commodity are bought because their market value is expected to increase. Prudent buyers may do this to avoid the higher prices which may come. Speculators may buy in the hope of making a greater profit later on.

"Dead stock" - the negative side

Unfortunately, a lot of warehouse space is taken up with neglected or obsolete items. Too often unwanted items accumulate for which no-one will take responsibility. This *dead stock* should not be allowed to take up valuable warehouse space. It should be removed.

The 4 main objectives of a warehouse must be:

(1) To protect goods all categories of stock from damage by careful storage and handling, preventing goods deteriorating by providing the correct storage conditions and preventing goods being lost or stolen by adhering to strict security regulations.

(2) To keep an accurate and updated record of items received, items in stock and items issued, to keep management informed of all movements of stock, and to give an account of transactions to users on request.

(3) To provide a service i.e. to issue goods quickly and efficiently to users and distribute goods efficiently to other places.

(4) To provide a constant source of supply of consumer items in short supply - sugar, kerosene, grain, textiles etc. [This discourages people from hoarding goods or profiteering]. To provide materials, equipment and spares to industry so that production is not held up (Warehousing techniques for imported goods Geneva, 1991.)

Warehouses function as node points in the supply chain linking the material flows between the supplier and the customer As a result of the highly competitive market environment companies are continuously forced to improve their warehousing operations. Many companies have also customized their value proposition to better meet customer demands, which has led to changes in the role of warehouses. In such conditions improvement of order processing and materials handling can bring significant cost savings and at the same time increase customer value. The purpose of this study is to develop a warehouse design framework that supports systematic decision making, and show that this framework can be used to reduce order processing cycle times and improve the overall performance of a warehouse (Tommy B., 2010).

Large product varieties and shortening customer response times have placed a tremendous emphasis on the ability to establish smooth and efficient logistics operations. Warehouses play a vital role in determining the effectiveness and efficiency of these operations because they function as nodes that direct the flow of materials within a distribution network (Ibid, 2010).

The effects of organizing warehousing activities can directly be seen in customer service levels, lead times, and the cost structure of a company. In other words, warehousing influences the performance of an entire supply chain. Warehousing has also been recognized throughout the scientific literature as one of the main operations where companies can provide tailored services for their customers and gain competitive advantage (Ibid, 2010).

The logistics costs caused by a warehouse are often determined already during its design phase. As such warehouse design is a complex task where managers often need to cope with multiple conflicting objectives. Managing warehouses involves making decisions on the policies that are used to govern the tangible material flows and the intangible information flows. These flows are unique for each warehouse and may change over time. This means that there is a continuous need to systematically analyze and rearrange warehouse processes according to latest trends in the business (Tommy Blomqvist 2010).

This study was be conducted as an initial study of warehouse performance in Meta Abo Brewery Share Company. The company is playing the vital role of in supplying Beers an Alcoholic beverages to its customers, controlling the flow of goods from the producers to the end customer. As a result, there is a constant need to improve the cycle time of internal logistics processes. From the company perspective, the interest towards this study came from the fact that it is about to set up an improved warehouse performance indicators in Meta Abo Brewery Share company.

The problem in the warehouses is that the old and conventional methods which are obsolete are combined with very crowded conditions. This may result in very slow material movement and this leads to increase in inventory holding costs and also increase in the operating costs. The businesses will not tolerate this increase in costs; hence there is always a quest for newer and better methods. However, merely installing the newer methods does not mean that the system is effective and efficient, there is also necessity of a strong supervisory organization of the system to make the methods more effective and this also requires lot of training and managing the operations(Mahesh et al.2009).

In this research study, a researcher has look into the concept of warehousing very briefly according to the theoretical perspective and then actually examine the effect of warehouse performance in Meta Abo Brewery Share Company and in the real world in order to get an insight of the warehouses and the strategies they are adapting in order to work effectively and efficiently and at the same time reduce the overall costs as well as to increase warehouse performance that has direct impact on customer satisfaction.

2.1.2 Warehousing Management Systems

A Warehousing Management System comprises a number of interlinked systems – storage and handling, information and quality assurance. According to Rushton et al (2000), the storage function is the single major consideration in designing a warehouse; ostensibly because storage

occupies more space than any other activity in the warehouse, and hence accounts for a significant part of the building costs. Operationally, storage systems impact on stock management as well as product protection and integrity. According to Ruston et al, 2000, the key factors influencing the choice of a storage system are:

a) The nature and characteristics of the goods and unit loads held

b) The effective utilization of building volume – horizontal and vertical

c) Good access to stock

d) Compatibility and information system requirements

e) Maintenance of stock condition and integrity

f) Personnel safety

g) Overall system cost

In selecting equipment for the storage of items, the following factors should be taken into consideration: The equipment must be capable of retaining what is stored in, that is, items must not be able to fall out of the equipment.

In a Warehouse Management System, the handling systems are designed to maintain the product in a suitable state for the final customers. This implies minimizing damage, loss or deterioration, satisfying stock rotation or product life requirements and meeting any legal constraints on storage environment such as temperature limits (Rushton et al 2000).

Safety has always been of prime importance in warehousing because of the amount of movement, lifting and manual handling involved. Even with the levels of mechanization and automation in some modern installations, safety is still of key importance. Safe working practice is a moral obligation and also makes economic sense by minimizing lost staff time, the costs that can be incurred in accident investigations, and the possible legal costs and claims that may be incurred. Packaging is an integral part of the supply chain and the design and use of packaging impact not only on storage and handling, but also on other functions such as production, marketing and the most appropriate type of unit load to be used (Rushton et al 2000).

The unit load concept puts products into appropriate standard modules for handling and storage, movement, loading and unloading. A unit load is an assembly of individual items or packages, usually of a like kind to enable convenient composite movement, whether manual or mechanized. Examples include pallets of goods or other materials (roll cage pallets, post pallets, cage pallets and ISO containers). The benefits of effective unitization include moving maximum quantities of goods per journey, minimizing the number of movements and generally facilitating the interface

between warehousing and transport operations including vehicle loading and unloading. The unit load concept enables the use of standard equipment irrespective of the product being handled, thus achieving product protection, security and economy in the use of space. (Rushton et al 2000).

2.1.3 Lean Ware housing/ 5s

5 s is five Japanese words: seiri, seiton, seiso, seiketsu, and shitsuke. These have been translated as "Sort", "Set in Order", "Shine", "Standardize" and "Sustain". The list describes how to organize a work space for efficiency and effectiveness by identifying and storing the items used, maintaining the area and items, and sustaining the new order. The decision-making process usually comes from a dialogue about standardization, which builds understanding among employees of how they should do the work. In some quarters, 5S has become 6S, the sixth element being safety. (Gapp, 2008)

Other than a specific stand-alone methodology, 5S is frequently viewed as an element of a broader construct known as visual control, visual workplace, or visual factory. Under those (and similar) terminologies, Western companies were applying underlying concepts of 5S before publication, in English, of the formal 5S methodology. For example, a workplace-organization photo from Tennant Company (a Minneapolis-based manufacturer) quite similar to the one accompanying this article appeared in a manufacturing-management book in 1986. (Gapp, 2008)

2.2. Defining Performance Measurement

When exploring literature on performance management and performance measurement it's clear that this topic has been and still is significant both to researchers and practitioners. Tens of thousands of articles, book chapters and conference journals can be found. This research study however has only provide a brief introduction to performance management, measurement and metrics based on the most recognized literature. (Bititci et al, 1997)

To get a brief understanding about any business term a definition is often a good start. Performance management has been defined as a "process by which the company manages its performance in line with its corporate and functional strategies and objectives" (Bititci, et al, 1997).

2.2.1. Warehousing/Storage Performance Indicators

For describing the warehouse performance and improvement we should have to perform a process mapping. It is a useful way for depicting all activities that take place in the warehouse.Generally, a company's warehouse operations can influence the firm's corporate performance in manners

such as receiving, storage and shipping (dispatching) in relation with quality, Cost, Speed and productivity. Receiving, Storage as well as picking and shipping has their own cost, quality such as perfect order fulfilment incorporating accuracy and response time as a speed should be measured and continuously improved. To narrate Warehouse activities performance with performance indicators the below table explains the relation.

2.2.2. Factors of Warehouse Performance

Different factors have been employed by various researchers to operationalize warehouse performance with a visible repetition in the use of some of these factors (John M. Hill's, 2007), indicators to assess the performance of the warehouse, grouped into three categories, (Aronovich, Dana, Marie Tien, Ethan Collins, Adriano Sommerlatte, and Linda Allain. 2010), (Per Axelsson & Jonathan Frankel, 2014) and (Ilie Liviu, Turdean Ana-Maria and Crisan Emil, 2009). The use of one or another factor by these research works have been justified by the respective contexts considered for particular assessments.

This study has adopt four of the most commonly used factors in the literature, namely Quality, response time, total warehouse cost, and productivity so as to operationalize warehouse performance metrics.

Table 2.1: Warehousing/Storage Performance indicators

Quality Indicator	Response Time Indicator	Cost/Financial Indicators	Productivity Indicators
Inventory Accuracy rate	Warehouse Order processing Time	Total Warehousing Cost	Storage Space Utilization
Movement Accuracy	Custom Clearance Cycle	Value of Product damaged in the warehouse	Units Moved per person Hour
Picking accuracy rate	Put away time		% of storage space dedicated for handling
Warehouse Accident rate			
Defined security Measures			

Source: A modified adoption from Aronovich, Dana, Marie Tien, Ethan Collins, Adriano Sommerlatte, and Linda Allain. 2010.)

2.2.2.1 Quality

A. Inventory Accuracy Rate

This indicator measures the percentage of warehouse or storage locations that had no inventory discrepancies when stock cards were compared to a physical inventory count out of the total number of locations under review, during a defined period of time. Alternatively, this indicator can be calculated for a single facility as the percentage of months or quarters with no inventory discrepancies out of the total number of months or quarters in the review period (e.g., annual). (F.cruits Barry, 2011)

The inventory accuracy rate can be used to assess overall inventory control performance for a group of storage facilities or for one storage facility over a set of review periods. Inventory accuracy is critical for managers to know how much they have in stock at any given point in time and to know when a new order must be placed to replenish stock. This discrepancy analysis can help managers identify storage locations that are having problems with inventory management; the analysis can lead to opportunities for improvement.(F.curtis Barry, 2011)

B. Movement Accuracy

This indicator is the percentage of items placed in the correct location or bin in a warehouse or storage area.

This indicator measures a facility's ability to stock items in the correct location so they can be quickly and easily located. This can provide an indication of whether staff is practicing good warehousing practices and guidelines. This indicator can be measured during a site visit or by making periodic checks at the facility over a specified length of time. For example, during a quarterly period, the number of times items were found in the wrong location.

C. Picking Accuracy Rate

This indicator is defined as the percentage of items or lines picked accurately (i.e., the correct items and quantities) from storage based on a request or packing list, and then placed into the appropriate container.

This indicator measures whether items are accurately selected from storage and placed into a container to be shipped to the requesting facility. It can reveal the ability of the facility to pick requests correctly in terms of quantity and item. Errors can result in stock outs or overstocks at the ordering facility. To collect data for this indicator, a review of items just before they are loaded for transporting can be conducted to determine the accuracy of picked items compared against an

invoice or requisition form. It can be calculated for a single order or for all orders during a defined period of time.

D. Warehouse Accident Rate

This indicator measures the total number of accidents occurring in a warehouse or other storage facility during a defined period of time.

This indicator can reveal poor warehouse management and practices, untrained staff, unclear safety guidelines, faulty equipment, or poor conditions. It can help pinpoint areas needing improvement by determining the cause of the accidents because of human error or other reasons. With intervention, accidents should decrease in frequency.

E. Defined Security Measures

This indicator measures whether there are guidelines or standard operating procedures (SOP) in place that provide instructions to prevent theft or leakage at a given storage location. Implementing proper security measures at storage facilities will help prevent theft and leakage of products, thus saving money and increasing the availability of commodities.

The program should have defined and detailed instructions for facilities to follow to ensure that the facility is secure and the products protected. Evaluators should also assess the quality or thoroughness of these guidelines or SOPs and the level of adherence by the facilities.

2.2.2.2 Response Time

A. Warehouse Order Processing Time

This indicator measures the average amount of time (e.g., minutes, hours, days, weeks) from the moment an order is received at the storage facility until the time the order is actually shipped to the client. The order processing time can be calculated for a specific shipping facility averaged across orders or on average for orders to a specific client or for a specific product.

This indicator helps monitor the order processing performance and the efficiency of a shipping facility. It also helps identify opportunities for improving staff performance in order management and a facility's response time. (Geraldiene, 2011)

B. Customs Clearance Cycle

This indicator measures the amount of time (e.g., minutes, hours, days, and weeks) from the moment the cargo arrives in the port or airport until the moment that it clears customs, arrives at the warehouse, and is ready to be put away. This indicator can be calculated by product or

supplier, or the average across products or suppliers, during a specified period of time. If other factors affect getting the product from the port to the warehouse, such as a lack of equipment at the port facility, evaluators can scale this calculation down to the specific amount of time that the products were sent to the customs office until the customs office cleared and released them.(Geraldiene, 2011)

The indicator can help identify delays in customs clearance and, with additional research, the causes involved—such as incomplete paperwork, poor material description, missed certificate of origin, etc. Based on that, opportunities for improvement can be identified and actions taken to minimize the amount of time required for products to clear customs and to be made available at the warehouse.

C. Movement Time

This indicator measures the amount of time it takes from when a product(s) has been unloaded from a truck after arriving at a warehouse or other storage location to when it is stored in its designated place and is ready for picking. This indicator can be calculated by product, or by shipment, or as an average across products or shipments, during a specified period of time.

Measuring the put-away time can help improve productivity by monitoring the efficiency of the put-away processes and the staff responsible for the task. It can help managers identify work conditions or processes that need improvement, as well as the need for staff training.

2.2.2.3 Cost/Financial

A. Total Warehousing Cost

The total warehousing costs collect all costs related to warehousing, such as labor costs and warehouse rent; or mortgage payments, utility bills, equipment, material- and information handling systems, etc. It also includes costs related to systems, supplies, and any other material with specific use in warehousing. This indicator is usually measured annually.

This indicator can also be calculated as the total warehousing cost per piece/SKU/product/line by dividing the total warehousing cost by the quantity of stocked units or by the volume of stocked items in cubic meters (m3), per storage area (m2), or program.

Using this indicator, managers can monitor the costs of different components in a warehouse, as well as compare costs between different warehouses. It can help identify the most cost-effective warehouses, and can also lead to an analysis of best practices.

Dividing total warehousing costs by units or area can also indicate storage usage, cost effectiveness, etc. By dividing the warehousing costs per SKU, this indicator provides the management team with excellent detailed cost visibility.

B. Value of Product Damaged in the Warehouse

This indicator calculates the value of products damaged, during a defined period of time (usually one year), in the warehouse as a percentage of the value of all shipped products during that period. Inappropriate warehousing conditions or handling of products can lead to inventory damage.

This indicator can help put the value of products damaged into perspective and can be used to help identify the causes, as well as, the actions needed to avoid such damages, including better infrastructure, manpower, training, etc.

2.2.2.4. Productivity

A. Storage Space Utilization

Storage space utilization indicates the percentage of the total storage space actually being used out of the total storage space available. Based on this indicator, managers can monitor storage capacity and utilization at a warehouse.

By assessing storage space utilization, managers can look for opportunities to improve storage capacity (e.g., remove expired products, de junking, reorganizing) and maximize the use of the storage space, or request a re-evaluation of layout, material flow, shelves disposition, etc.

B. Units Moved Per Person-Hour

This indicator measures the number of units (e.g., boxes, pallets) or weight moved during a defined period of time, per person-hour, for each person working during that period. It can be considered both when receiving and shipping inventory.

This indicator helps measure material handling productivity for a period of time (hours, days, or months). It helps compare productivity levels in different working shifts or different warehousing locations. It can be a source for identifying needs for training and measuring its effectiveness. (Beckham, 2007)

C. Percentage of Storage Space Dedicated to Product Handling

This indicator measures the percentage of total storage area that is dedicated specifically to product handling (receiving, unloading, packing, loading, and dispatching).

It is recommended that a certain percentage of the storage area be dedicated specifically to product handling for an average volume of products. The amount of handing space needed depends on the volume of product moved through the storage area and the equipment required to move those

products. This dedicated area is critical for the efficient operations of the storage facility to allow for organized and efficient receiving, unloading, packing, loading, and dispatching of products; and to protect products from the elements during receiving and packing. (Beckham, 2007).

2.3 The Concept of Performance Measurement in a Supply Chain Context

Performance measurement is generally defined as the process of quantifying the efficiency and effectiveness of action, where effectiveness is meant to gauge the extent to which customer's requirements are met, while efficiency measures how economically firm's resources are utilized to achieve a predetermined level of customer satisfaction (Neely et al., 1995) on Agami, Saleh and Rasmy, 2012). However, firm performance is a multi-dimensional concept that involves many aspects in its measurement. (Akyuz & Erkan, 2010) argued that despite the large number of works done on performance measurement, the existing literature lacks a unified definition of what is included and excluded. However, it has been also asserted that performance concept includes both financial and non-financial (operational) aspects and related measures wherein the financial aspect supposed to include sales, profitability and Return on Investment (ROI) as pertinent measures among others, whereas the non-financial aspect, on the other hand, supposed to include measures like inventory performance and cycle time to mention few (Martin and Patterson, 2009).

Particular to supply chain management, (Thakkar, Kanda, and Deshmukh, 2009) suggested that since it is affected by, and in turn affects, many aspects of the firm's operations, and environment, the supply chain performance measurement is a difficult proposition. In a similar fashion, Otto and (Kotzab, 2003) asserted that performance in a supply chain context and its measurement is dependent on the unique notions and problems, which can be identified beyond the perspectives available to be considered, and hence, none of the available alternatives is an optimal approach for all contexts; instead, from the SCM holistic requirements, different performance metrics should be combined. (Thakkar et al., 2009) also suggested, in this respect, that performance measurement metrics should have the capability to capture the essence of organizational performance, ensure an appropriate assignment of metrics to the areas where they would be most appropriate, minimize the deviation that exist between the organizational goals and measurement goals, and measures, and reflect their clear linkages with various levels of decision-making such as strategic, tactical, and operational.

Regarding the application of specific performance metrics in the supply chain management context, some studies suggest the blended and balanced use of both financial, i.e. Revenue, profit, ROA and ROI… etc, and non-financial/operational, i.e. inventory reduction, improved delivery

service, decreased order cycle times and greater product availability…etc, metrics (e.g.(Thakkar, Kanda, and Deshmukh, 2009; Li, Ragu-Nathanb, Ragu-Nathanb, and Raob, 2006; Gunasekaran, Patel, and Macgraughey, 2004). Through a structured literature review on warehouse performance, (Ilieş Liviu, Turdean Ana-Maria and Crişan Emil Babeş, 2009) reinforced this claim by revealing that the majority of literatures they reviewed have examined the effect of supply chain management on combination of overall measures.

However, (Van der Vaart and van Donk, 2008) also argued that it would be very difficult to attribute total supply chain or firm performance to particular supply chain factors especially when performance is measured in overall terms such as market share, ROI and profitability since with these general measures, there are many other (both economic and managerial) variables that impact on performance items (Rodriguez, 2009; Van der Vaart and van Donk, 2008). Similarly, (Huoet al., 2014) stressed that though financial performance has been widely used as a key output measure of firm performance; numerous studies have pinpointed the limitations in relying on financial performance measures in supply chain studies.

2.4. Review of Empirical Literature

According to (Ilieş Liviu, Turdean Ana-Maria and Crişan Emil Babeş, 2009) – A Case Study on Warehouse Performance Measurement states that Companies could gain cost advantage using their logistics area of the business. Warehouse management is a possible source of cost improvements from logistics that companies could use during this economic crisis.

In their case study they puts best practices used in warehouse performance measurement which lead to performance improvements. How can a manager use them in order to improve the warehouse performance and their solution was Warehouse performance measurement refers to the measurement of: optimal use of storage space, customer relations activity, quality level, assets usage and costs. (Ilies Liviu, Turdean, 2009). (Ilieş Liviu, Turdean Ana-Maria and Crişan Emil Babeş, 2009). in their case, setting an indicator system for warehousing activity is the key for performance improvements, as it shall be presented in the example. They presented here some key indicators that are used around the world to measure warehouse performance:

<center>**CHAPTER THREE**</center>

<center>**RESERCH DESIGN AND METHDOLOGY**</center>

3.1. Research Approach

This research decided to employ a combination of qualitative and quantitative approaches of doing research, which has been practiced, as recommended by (Creswell, 2009). According to (Mark et al., 2009) mixing qualitative and quantitative approaches gives the potential to cover each method's weaknesses with strengths from the other method.

3.2. Research Design

Research design is the blueprint for fulfilling research objectives and answering research questions (John A.H. et al., 2007). In other words, it is a master plan specifying the methods and procedures for collecting and analyzing the needed information. It ensures that the study had been relevant to the problem and that it uses economical procedures. The same authors discusses three types of research design, namely

i. Exploratory (emphasizes discovery of ideas and insights),

ii. Descriptive (concerned with determining the frequency with which an event occurs or relationship between variables) and

iii. Explanatory (concerned with determining the cause and effect relationships).

The survey method can be used for three types of research, namely descriptive (which focuses on the determination of the frequency with which an event occurs and how variables are related/associated in a particular context), exploratory (which emphasizes on the discovery of ideas and insights), and explanatory (concerned with determining the impact and cause and effect relationships among variables), (Bhattacherjee, 2012; Adams, Khan, Raeside, and White, 2007).

Therefore, the types of research employed under this study is descriptive research. The major purpose of descriptive research is description of the state of affairs as it exists at present. Then this study describes and critically assesses some key performance indicators of selected warehouse in the company. Moreover, obtaining information from a cross-section of a population at a single point in time is a reasonable strategy for pursuing many descriptive researches (Ruane, 2006), hence justifying the use of a cross-section analysis in this particular study. The finding and conclusion of the study is depend on the utilization of statistical data collection and analysis.

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3.3. Research Methods

3.3. 1. Sampling Technique

3.3.1.1. Target Population, Unit of Analysis and Respondents

All warehouse personnel which has direct relation with warehouse like inventory and store are taken to constitute the study population. Due to the very small number of the target population, which was 70 in number, it has been decided to consider the entire population in the study, i.e. to conduct census survey, rather than sampling from the population. This is on the basis of the suggestion that if the target population is smaller (e.g. 100 or less) census survey is very appropriate and effective since virtually all population would have to be sampled in small populations to achieve a desirable level of precision (Israel, 2013).

As far as the unit of analysis is concerned, the warehouses of the company, was taken to be the unit of analysis for this particular study. And every warehouse personnel's of the company was the pertinent respondents for the study. Warehouse personnel was chosen because of the fact that they are most accustomed with and have the relevant information pertaining to the warehouse activities of the company.

3.3.2. Data Collection & Data gathering Tools

The study data were analyzed using Statistical Package for the Social Science (SPSS) version 20.0. Frequency tables and percentages were used to summarize the demographic information of respondents; whereas, descriptive statistics such as mean and standard deviations of the respondents' scores on all the dimensions were assessed in order to determine the extent Warehouse performance in the company. Finally, detail interpretation and discussion of the results of the statistical analysis was provided.

Both primary and secondary sources of data/information are used for the purpose of conducting this particular research. Primary data is the information that the researcher finds out by himself/herself regarding a specific topic having the likely advantage that the data is collected with the research's purpose in mind, whereby ensuring the resulting consistency of the information with the research questions and purpose (Biggam, 2008).

The primary data was gathered through a well-developed questionnaire from the entire population of the company. The questionnaire is designed in a way that enabled to capture the demographic

information of respondents, on the one hand, and their evaluation of warehouse performance, on the other hand. Regarding the secondary source, journals, procedures, policies and guidelines produced by the company as well as any other concerned bodies are used to extract any sort of essential information to strengthen the study findings.

As far as the procedure of data collection is concerned, contacts had been initially made to respondents to explain the purpose and nature of the study so as to achieve the desired response rate. Subsequently, the questionnaire was distributed to and collected physically from the potential respondents at their site by the researcher. The layout of the questionnaire is kept very simple to encourage meaningful participation by the respondents. The questions is kept as concise as possible with care taken to the actual wording and phrasing of the questions. The reason for the appearance and layout of the questionnaire are of great importance in any study where the questionnaire is to be completed by the respondent (John A. et al., 2007).

Moreover In order to improve my study and strength my findings, I were referred articles, academic journals, and useful texts through different sources, such as library, journals, academic books and relevant documents from the company.

Instruments of data collection prepared to collect the data from the target population. With regard to the questionnaires, a five point Likert scale (5=strongly agree, 4=agree, 3=no opinion, 2=Disagree and 1=strongly Disagree) is used and some of the items which is better to describe the variable under study were adopted from Mustafa Najia, (2008).

The validity and reliably of the data collection were tested to check the relevance and consistent of research instrument. Then after, the questionnaires were distributed to the participants of the study up on the stated schedule.

After the questionnaires are carefully filled, the researcher personally collects and arranges the completed questionnaire for data discussion and analysis. Finally, the collected data was inserted in to Microsoft Excel and made ready for data analysis and discussion by using (SPSS version 20.0), and then the results were summarized, tabulated and interpreted appropriately.

3.4. Validity and reliability

3.4.1 Validity

Validity is the degree to which a test measures what it purports to measure (Creswell, 2009). Validity defined as the accuracy and meaningfulness of the inferences which are based on the research results. It is the degree to which results obtained from the analysis of the data actually

represents the phenomena under study. He contends that the validity of the questionnaire data depends on a crucial way the ability and willingness of the respondents to provide the information requested.

A pilot study were conducted to refine the methodology and test instrument such as a questionnaire before administering the final phase. Questionnaires was tested on potential respondents to make the data collecting instruments objective, relevant, suitable to the problem and reliable as recommended by (John Adams et al., 2007). Issues raises by respondents was gathered and questionnaires was refined accordingly. Besides, proper detection by an advisor and subject matter expert was also taken to ensure the content validity of the instruments. Finally, the improved version of the questionnaires was printed, duplicated and dispatched.

3.4.2 Reliability

To determine the reliability of the scales for internal consistency of the questionnaires, Cronbach's Alpha was measured. Cronbach's alpha gives the proportion of the total variation of the scale scores that is not attributable to random error. In this regard, values of 0.80 or greater are considered adequate for a scale that will be used to analyze associations. (Schoenbach, 2004)

Table 3.1: Reliability Statistical results

Dimension/Scale	No. of items	Cronbach Alpha
Quality Indicator	*5*	*0.75*
Response time indicator	*5*	*0,75*
Cost Indicator	*6*	*0.78*
Productivity Indicator	*8*	*0.82*

Source: - Survey result, 2018

As it shown in table 3.1:- A scan at the above table implies that all alpha values for the respective dimensions were well above the suggested cut-off value of 0.7 (Cronbach, 1951), hence implying the reliability of the instrument that measures the study constructs, i.e. the items under the respective scales could properly measure the dimension of concern. The lowest alpha value was 0.75 and it was in the case of both quality indictor and response time indicator, whereas the highest was for productivity indicator with the alpha value of 0.82.

3.5 Ethical Considerations

Ethical considerations are of utmost importance while trying to advance knowledge through scientific inquiry. This is due to the fact that scientific studies usually involve human participants and, hence, if due care is not given to the manner as to how information is obtained from these participants and while disclosing such information, some sort of damage might be inflicted on the study participants. Considering this reality, the study has attempted all the necessary precautions to protect the study participant's form such sort of problematic encounters by applying certain measures. Accordingly, the respondents were notified not to mention their identity, particularly their names while filling questionnaire. Moreover, they have been assured that no meaningful damage would be inflicted on them because of their participation in this particular study by boldly explaining to them the apparent purpose of the study (which is actually for academic purpose) and ensuring the confidentiality of their identity and whole part of the information they provided for the purpose of undertaking this study.

CHAPTER FOUR

DATA PRSENTATION, ANALYSIS AND INTERPRETATION

A total of 70 respondents completed the questionnaire .The group characteristics of the sample are presented as the following sections.

4.1. Company Profile

Meta Abo Brewery Share Company SC manufactures and markets beer. The company was founded in 1963 and is based in Sebeta, Ethiopia. As of January 10, 2012, Meta Abo Brewery Share Company SC operates as a subsidiary of Diageo plc. The company currently involved in producing a variety brand of beers and distributing a variety of branded whiskies to the Ethiopian market.

The Warehousing and warehouse management are part of the logistics management system, which is itself a component in supply chain management of the company. The warehouses are designed in a way to store finished goods, raw materials, chemicals packaging materials. Generally, the warehouses serves the inbound functions that prepare items for storage and outbound functions that consolidate, pack and ship orders provide important economic and service benefits to both the business and its customers.

As inferred in the preceding part of this study, the entire population of the company in selected warehouses was considered in the study. Including all the stakeholder of the phenomena, hence making the total number of respondents 70. However, only 65 respondents have filled and returned the questionnaire, which essentially made the response rate about 87%.

4.2 Respondents' Background Information

The demographic information of the respondents who have filled and returned the questionnaire is presented on table

Table 4.2: Response rate for respondents of Meta Abo Brewery Share Company

Description	Respondents/Employees
Census	**70**
Questionnaire distributed	**70**
Questionnaire returned	**65**
Response rate (%)	**90%**
Usable responses	**65**

Source: - Survey result, 2018

As it is mentioned in the table3.2 above 70 samples were selected as a stated census of the study by the researcher, however, from the 70 questionnaires 65 were returned back. Therefore, 65 questionnaires legitimate questionnaires were ultimately used as bases on which the research was conducted.

4.3. Descriptive Statistics on Quality Indicators in Warehouse Performance

Table 4.3.: Quality as Warehouse Performance Indicator Statistics

Items	N	Mean	Std. Deviation
The company applies a 5s warehousing system	65	2.28	1.244
There is a proper flow on receiving system in for incoming materials	65	2.707	1.33139
There is high accuracy rate from receipt of loads to stacking of its final destination	65	2.74	1.302
There is an effective workforce utilization in place	65	2.77	1.142
There are well organized warehouse equipment's in each warehouses of the company	65	2.66	1.004
There is a high customer satisfaction on item receiving and response	65	2.58	1.088
The minimum & maximum stock levels are maintained in all warehouses of the company in a good manner	65	2.63	1.024
All warehouse documentation are filed and maintained in a good manner	65	2.78	1.166
The standard operating procedure for all material are prepared in a good quality	65	2.71	1.071
There is a risk assessment process for any stacking and material handling process in each warehouses	65	2.68	1.133
GRAND MEAN & SD		**2.65**	**1.15**

Source: -Survey result, 2018

In the above table, the mean values of each of the measurement items of quality indicator were calculated between 2.28 and 2.78 with almost comparable standard deviations that range between 1.07 and 1.33. The lowest mean value is registered in the case of warehouse 5s implementation and high customer satisfaction in the second place followed by the mean score for implementation of minimum and maximum stock level which is very comparably close mean values of 2.58 and 2.63 respectively; while maintaining warehouse documentation, comes last in the ascending order.

The noticeably represented mean scores of the measurement items of quality indicator suggest that respondents in the company believe that lower efforts have been made by their respective companies. To enhance warehouse performance in the case of quality except in the case of

maintain documentation in which case the score is moderate suggesting that relatively moderate efforts have been exerted. This implies the fact that the attempts made by the company are not as such substantial pertaining to implement the 5s system in the warehouse, maintaining warehouse guide line or procedure, holding or storing items in their right place in the warehouse, following the right way concerning warehouse documentation and/or bin card posting and also picking the right requested item in the warehouse.

Concerning standard deviation of values of each of the measurement items of quality indicator, as well as on the other indicator except in the case of response time indicator, it indicates that the perception of the respondents' on the issue are in the unlike poles on all of the case. However, this is acceptable as the study utilized all population and also it is believed that the standard error is relatively very low (between 0.13 and 0.15). In fact, the standard error is an indication of the reliability of the mean. A small SE is an indication that the sample mean is a more accurate reflection of the actual population mean. A larger sample size will normally result in a smaller SE (while SD is not directly affected by sample size, Kothari, 2000) as this study used.

4.4. Descriptive statistics time indicator of warehouse Performance (WP)

Table 4.4: Time as warehouse performance indictor statistics

Items	N	Mean	Std. Deviation
There is a good customer cycle order time in each warehouse of the company	65	2.57	1.118
There is an effective and manageable time to process receipt/GRN	65	2.86	1.197
All warehouses serves customers at a reasonable time	65	3.06	1.273
All issue/releases have been handle at reasonable time	65	2.77	1.196
All loading and unloading time are reasonable	65	3.22	1.205
Tracking files have been carried on at reasonable time	65	3.23	1.209
The per line item to pick from storage area to the users department	65	3.06	1.130
The lead time for every line item is reasonable	65	2.78	1.097
The replacement time for rejected items by the internal customers is reasonable	65	2.77	1.183
The stock in hand movement in all internal warehouse is at reasonable time	65	3.08	1.177
GRAND MEAN & SD		**2.94**	**1.18**

Source: - Survey result, 2018

The mean values of each of the measurement items on response time indicator were calculated between 2.57 and 3.23 with almost comparable standard deviations that range between 1.09 and

1.27. The lowest mean value is registered in the case of Good customer cycle order and followed by releasing material at reasonable time, and replacement of rejected items and then mean score for lead time.

The scores of the response on time indicator which are very comparably close mean values of 3.22, 3.23 and 3.08 as depicted on the aforementioned table. So they suggests that respondents are rating their respective company warehouse performance as moderate or a little bit above, as in the case of their evaluation regarding response time

4.5. Descriptive statistics cost indicator in warehouse Performance (WP)

Table 4.5:- Cost as warehouse performance indictor statistics

COST INDICATOR			
Items	N	Mean	Std. Deviation
There is reasonable cost on item offloading/loading	65	2.14	1.171
There is a reasonable cost of shipping per order	65	2.32	1.174
There is a reasonable cost per line item picked from storage area to the user department	65	2.20	1.135
There is a reasonable cost for picking lobar	65	2.31	1.117
There is a reasonable and less inventory carrying/holding cost	65	2.32	1.264
The process order cost for each for each shipping is reasonable	65	2.49	1.147
The cost related with monthly inventory is reasonable	65	2.57	1.075
There is less cost related to brakeage due to improper handling	65	2.35	1.007
There is reasonable cost associated with material at each store	65	2.62	1.071
The cost related with store documentation is reasonable	65	2.75	1.132
GRAND MEAN & SD		**2.41**	**1.13**

Source: - Survey result, 2018

The above table show, the mean values of the measurement items of cost indicator which are value of cost related with store documentation in the warehouse and reasonable cost in material offloading were calculated and found that 2.75 and 2.14 with a standard deviations of 1.132 and 1.171 respectively. The respondents suggests that their warehouse performance is hampered concerning cost reduction in both cost of damaged goods and also cost associated with carrying or holding a product.

The scores of the scale of response cost indicator on cost of each line items, cost of shipping per order and reasonable cost picking per order which is very comparably close mean values of 2.21, 2.32 and 2.31 as depicted on the aforementioned table. So they suggests that respondents are rating their respective company warehouse performance as low, as in the case of their evaluation regarding response cost.

To sum up, the total mean value of the each cost indicators shows less than three which shows the cost plays a low role on warehouse performance. As indicated above it ranges from 2.14 to 2.75 and the respective standard deviation ranges between1.007 to1.264.

4.6. Descriptive statistics Productivity indicator in warehouse Performance (WP)

Table 4.6.: Productivity as warehouse performance indictor statistics

PRODUCTIVITY INDICATOR			
Items	N	Mean	Std. Deviation
The cost related to warehouse space utilization is minimum	65	2.31	1.117
There is a balanced direct labor cost in each warehouses	65	2.52	1.062
There is productivity in all stores & warehouses	65	2.83	1.193
There is employee turnover cost in each warehouse	65	2.75	1.199
In your warehouse is it efficient to attain productivity	65	2.40	1.356
There is a continuous improvement in all warehouses	65	2.42	1.286
There is a cost wise warehouse management system in the company	65	2.46	1.347
GRAND MEAN & SD		**2.52**	**1.22**

Source: - Survey result, 2018

On the above table, the mean values of each of the measurement items of productivity indicator were calculated between 2.83 and 2.31 with almost comparable standard deviations that range between 1.062 and 1.356. The lowest mean value is registered in the case of percentage of storage space utilization dedicate and followed by efficient to attain productivity and then mean score for continuous improvement in all warehouses.

The scores of the scale of warehouse efficiency to attain productivity indicator and continuous improvement of all warehouses has very comparably close mean values of 2.40 and 2.42 as depicted on the aforementioned table. So they suggests that respondents are rating their respective company

warehouse performance as lower than expected, as in the case of their evaluation regarding the warehouse space and labor hour utilization whereas regarding space utilization for product handling is very lower effort have been exerted.

On Which Key Performance Indicator the Company Performs Better?

The Composite scores of mean and standard deviation were also calculated for the four scales of warehouse performance indicators (dimensions), namely quality indicator, response time indicator, cost/financial indicator and productivity indicator. The resulting composite scores of mean and standard deviation are presented on Table below follows.

Table 4.7: Mean and standard deviation

Dimension/Scale	Mean	Standard Deviation
Quality Indicator	2.65	1.15
Response time indicator	2.94	1.18
Cost Indictor	2.41	1.15
Productivity Indicator	2.52	1.22

Source: - Survey result, 2018

On the above the table, the mean values of each of the scales of warehouse performance were calculated between 2.41 and 2.94 with almost comparable standard deviations that range between 1.15 and 1.22 and also a standard error between 0.07 and 0.11. The lowest mean value is registered in the case of cost indicator followed by the mean score for productivity indicator; while quality indicator and response time indicator scored comparably close mean values of 2.65 and 2.94 respectively.

The mean score of the scale of warehouse performance in the case of response time indicator is 2.94 as depicted on the aforementioned table with a standard deviation of 1.18 and standard error of 0.07. This score is very marginally higher relative to the mean scores of the other dimensions. However, the fact that the composite mean score is only 2.94 suggests that respondents are rating their company warehouse performance as moderate and a little bit below as measured by this key low performance indicator. The same is true in productivity indicator, it is also in whereas in the case of cost indicator low effort have been exerted by the company and quality indicator in which case the score is even lower come in the bottom level.

What is the perception of the employees of the enterprise regarding the performance assessment of capacity of each warehouse?

In order to answer what is the perception of the employees of the company regarding the performance assessment of the capacity of each warehouse? Respondents Choice were summarized in tables as shown below (Table 4.8 and 4.9)

Table 4.8 Analysis of respondents based on Type of Warehouse

Choice		Number of responds	Percentage of respondents
Private warehouse		20	30.8
Public Warehouse		9	13.8
Automated Warehouse		9	13.8
Climate controlled warehouse		3	4.6
Distribution Center		15	23.1
Based on situation		9	13.8
Total		**65**	**100**

Source: - Survey result, 2018

As depicted in the above table most of the respondents are concentrated on based on situation choice regards the implication of the type of the warehouse on performance, and some of them believed that private warehouse and distribution are important in enhancing warehouse performance. The rest of the respondents were equivalently selects the other choices.

Table 4.9 Analysis of respondents based Size of warehouse

Choice	No. of responds	Percentage of respondents
Small	18	27.7
Medium	8	12.3
Large	11	16.9
Based on situation	28	43.1
Total	**65**	**100**

Source: -Survey result, 2018

The same attitude of respondents were snatched for the implication of size of warehouse on performance even more 85.25%, it is based on situation as depicted from the above table. And very few respondents were select the rest of the choice.

CHAPTER FIVE

MAJOR FINDNING, CONCLUSION AND RECOMMENDATION

5.1. Major findings of the study

Based on the structured questionnaire the researcher identified the following major findings.

- There is a poor warehouse performance in Meta Abo Brewery S.C. The study indicates there is a low mean score below 3(three) for all mean score of each performance indicators totally poor with most of them disagree with the item and less of them strongly disagree with the item and with few percent agree with the item.

- Most respondents with overall mean amount of 2.52 disagree with the satisfactory level of warehouse productivity indicator in Meta Abo Brewery Share company and some percentage strongly disagree for the provided items with the current productivity practice in all warehouses .

- As far as the educational background of the warehouse personnel is concerned about 66.15% of workers reveal that they are well-educated warehouse personnel in the company.

- There is no a standard 5s lean warehousing system in the company and this item supported by majority of the respondents with a high level of agreement. Therefore, this shows that there is no any standard warehouse evaluation method on the company.

- Most respondents disagree the customer focused warehouse performance of the company and some strongly disagree with this item and the remaining few respondents are reveal that neither agree nor disagree with the stated item and results in low mean score. Therefore, this indicates that the company does not have a customer focused warehouse operation.

- There is no self-development and strategy towards the four warehouse key performance indicators and this results in low mean score below three. Thus, this indicates that the company does not have any self-development and strategy towards the warehouse personnel to upgrade their performance indicators towards better prospective.

- The current warehouse performance of Meta Abo Brewery Share Company in relation to cost reduction is poor and the mean score of the result indicates below three with men

score of 2.41 for all items. Thus, the company has expected to work on reduction of cost in order to have a better cost reduction strategy along all warehouses.

- There is no well-organized warehouse equipment improvement policy and procedure in the company and this item adhere the low quality of each warehouses across the company. Therefore, this shows that the company does not have any warehouse performance improvement in bringing the quality of the right warehousing practice.

- Most respondents of the company disagree with the warehouse performance on brining high productivity on all sampled warehouses with a mean score of 2.52. Therefore, this indicates the company will be expected to improve and work more in productivity of all warehouses.

- Finally, almost all respondents disagree with most items under each performance indicators. Thus, this shows the company have many loopholes and problems in performing of each key performance indicators for its effective performance of its warehouse operation.

5.2 Conclusion

This thesis set out to map and explain the assessment of warehousing performance in Meta Abo Brewing Share Company. The objective of the researcher in this study was to assess the effective warehouse performance of taking four basic warehouse performance indicators on optimization of warehouse performance at the company. The study was also set out to find, how effective warehouse performance should be to improve truck turn-around for offloading and subsequent storage planning. The study looked at the warehouse performance and Key performance Indicators at the various sampled warehouses.

The following conclusions have been drawn on the bases of the findings of the data analysis effort.

To conclude with this research evidence that in most of these warehouses to state the quality indicator related with each sampled warehouses were too high with a mean value of 2.65. This indicates the company have not been give any due attention to reduce the existing cost. Hence poor customer satisfaction, the absence of well-organized warehouse equipment's, and the absence of 5s implementation had taken the largest part for poor quality across all warehouses.

Meta Abo Brewery Share Company was confronted with myriads of problems in its warehouse Performance. It was draw from the findings that, not having good customer cycle order, handling release at reasonable time, replacement time for rejection items and a delayed delivery time had

contribute a large share for the poor time use in all warehouses with a mean of less than three the cut point. But on the contrary stock in hand movement in all internal warehouses, all loading and unloading time and serving customers at reasonable time have relatively better response rate.

The inadequate warehousing space had an adverse effect on the productivity. The cost related to warehouse space utilization, a direct labor cost, employee turnover cost, and continuous improvement results in poor productivity across all warehouse of Meta Abo Brewery Share Company. The total mean score of the productivity indicates 2.52 which is low than the cut point. Therefore, the company have not work good in improving a productivity on all warehouses of the company.

Most respondents said inadequate cost reduction strategy in their company. Firstly, this results due to absence of reasonable cost on item offloading/loading. Secondly there is no reasonable cost per item picked from storage area, and reasonable cost of shipping per order with a total mean score of 2.41shows very low. Therefore, Meta Abo Brewery Company have a low practice and strategy in cost reduction across all operating warehouses.

Generally, the study findings have suggested that the levels of warehouse performance is low in the case of Meta Abo Brewery Share company in terms of the four key performance indicators as the perceived evaluation of the respondents imply. It has also revealed that, though measurement of the warehouse performance based on dimension of response time is comparatively in a better position. Respondents also implied that the performance assessment of each key performance indicators of each warehouse is based on the situation and they all have different point of view among the respondents that can heavily contributed to the overall performance of a warehouse.

5.4. Recommendation

Based on the above major findings and conclusions the researcher suggest the following recommendation to overcome the problem:
As revealed from the findings of the study, levels of warehouse performance at the Beer industry is approximately rated as moderate.

Hence, Meta Abo Brewery must give special emphasis in the improvement of warehouse performance in line with its corporate and functional strategies and objectives in order to operate according to international best practices and consistently offering quality products at affordable prices to the community.

The study advocated that a lot of emphasis need to be directed to warehouse management and performance measurement based on key performance indicators and the company should maintain the effort made on response time in enhancing performance of their warehouse which is still need to be improved and also the warehouse manager of the company should know the level of efficiency in the warehouse and makes sufficient amount of effort in utilizing of key performance indicators to measure warehouse performance by placing efficiency(performance) level targets

The study advocated that a lot of emphasis need to be directed to quality and cost indicator in order to reduce significant warehouse costs, to improve the quality service delivery and to achieve significant cost savings from minimized total cost of warehousing and improved quality
The company should give ranked emphasis to each of the performance indicator of warehouse to identify which dimension contributed a lot in enhancing performance.

The company should assure quality aspects through each and every activities of the warehouse like maintaining good quality procedure manual, inventory accuracies by placing products in their designated place, picking or loading accurately and implementing the 5s lean warehousing system.

The company should exert a tangible effort in reducing total cost of warehouse (carrying or holding cost) includes cost of product damage, cost of obsolescence, rental costs, insurance costs and etc.

The company should also give emphasis for storage space utilization including material handling space through the use of automated material handling equipment in order to improve productivity.

The company should consider the capacity implication on the performance of the warehouse especially in the case of size of the warehouse.

Finally the company should assure the level of satisfaction of warehouse customers (Suppliers and internal customers) by reducing the total operational & customers serving time. This could enhance the fast delivery of the customers and results in customers satisfaction.

5.5. Limitation of the study

With regard to limitation of the study, the possible barrier is that a researcher was carry out the study by self-sponsor and non-availability of adequate empirical research in the company. For this reason, an assessment had been undertaken from one main warehouse and three regional decentralized warehouses in Addis Ababa on taking a population 70 staff of Meta Abo Brewery share company main warehouse and decentralized warehouse personnel in Addis Ababa rather than covering across Ethiopia. So, this finding also excludes to generalize some remote warehouses and branches outside Addis.

5.6. Suggestion for future reference

This study mainly focuses warehouse performance a case of Meta Abo Brewery Share Company. But other researchers can be gone beyond the scope of this research to study the warehouse performance on other similar industries. The sample size stated by the researcher is equal with the number of population and other researchers can handle through large sample size to increase the reliability of the study.

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