ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS & ECONOMICS

DEPARTMENT OF ACCOUNTING & FINANCE

IMPACT OF INVENTORY MANAGEMENT ON OPERATIONAL PERFORMANCE OF ETHIOPIAN PHARMACUTICALS MANUFACTURING COMPANYS IN CASE OF CADILA PHARMACEUTICALS (ETHIOPIA) P.L.C

By Samuel Daniel (GSE/5692/14)

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ADDIS ABABA, ETHIOPIA

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A THESIS SUMMITED TO DEPARTMENT OF ACCOUNTING AND FINANCE ADDIS ABABA UNIVERSITY IN PARTIAL FULFILMENT OF THE RFQUIRNMENTS FOR MASTERS OF ACCOUNTING AND FINANCE.

ADVISOR: SEWALE ABATE (PhD)

ADDIS ABABA UNIVERSITY

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DEPARTMENT OF ACCOUNTING & FINANCE

I hereby certify that the thesis titled "Impact of Inventory Management on operational performance of Ethiopian pharmaceuticals manufacturing company's in case of Cadila Pharmaceuticals (Ethiopia) Plc", submitted as a proposal for partial fulfillment of the requirements for the degree of Masters of Accounting and Finance at Addis Ababa University by Samuel Daniel (ID No. GSE/5692/14), acknowledges the assistance and support received during this study. Therefore, I recommend its acceptance as meeting the thesis requirements.

SEWALE ABATE (PhD)	Signature	24/08/24
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I affirm that the thesis titled "Impact of Inventory Management on operational performance of Ethiopian pharmaceuticals manufacturing company's in case of Cadila Pharmaceuticals (Ethiopia) Plc", submitted as a proposal and for partial fulfillment of the requirements for the Masters of Accounting and Finance degree at Postgraduate Studies, Addis Ababa University, is my original work. I conducted this research independently, under the guidance and supervision of my research advisor.

Samuel Daniel
(GSE/5692/14

Signature

Date

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Approval sheet

We, the undersigned, members of the board of Examiners of the final open defense by Samuel Daniel have read and evaluated his thesis entitled "Impact of Inventory Management on operational performance of Ethiopian pharmaceuticals manufacturing company's in case of Cadila Pharmaceuticals (Ethiopia) Plc", this is therefore, to certify that the thesis has been accepted in the partial fulfillment of the requirements for the award of a master's degree in Accounting and Finance.

Name of Chairperson _____ _____

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ABSTRACT

This study investigates the impact of inventory management practices on operational performance at Cadila Pharmaceuticals (Ethiopia) P.L.C. (CPEL), emphasizing their crucial role in organizational improvement and achieving high levels of customer satisfaction. Primary data was gathered through questionnaires and interviews, complemented by secondary data from document evaluation. Adopting an Explanatory research design facilitating both qualitative and quantitative data analysis, the study distributed 56 questionnaires and employed descriptive statistics to analyze results. Correlational analysis and regression were conducted to explore relationships between independent variables (e.g., Material Requirement Planning [MRP], Distribution Resource Planning [DRP], Vendor Managed Inventory [VMI], Just in Time [JIT] System) and the dependent variable (operational performance), revealing statistically significant findings. The research highlights that CPEL has not fully implemented inventory management systems and recommends further investigation into factors influencing their adoption to enhance manufacturing companies' performance in Ethiopia.

Key words: Inventory, Inventory Management practice, Operational Performance

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Acronyms

GM : General Manager

GMP : Good manufacturing practice

PFSA: Pharmaceuticals fund and supply agency

PLC : Private limited company

SCM : Supply chain management

WHO : World health organization

ITR: Inventory Turn over ratio

SOP:Standard operating Procedures

EOQ:Economic Order Entity

JIT: Just in time

VMIS: Vendor Management Inventory System

MRP: Material Requirement Planning

DRP: Distribution Resource planning

CHAPTER ONE

1. INTRODUCTION

1.1. Back ground of study

Inventory constitutes a substantial portion of current assets in manufacturing enterprises, representing significant capital investments aimed at ensuring uninterrupted production flow and meeting consumer demand. However, managing inventory also entails holding costs and opportunity costs. Effective inventory management is therefore critical in balancing the benefits and drawbacks associated with inventory holding. Efficient management contributes significantly to the operational success and survival of businesses. Ineffective inventory management can lead to stockouts, reduced productivity and profitability, and customer dissatisfaction (Singaporean Journal). Maintaining an optimal inventory level is crucial because inadequate inventory can lead to lost sales and production disruptions, while excessive inventory levels incur unnecessary carrying costs and risks of obsolescence or spoilage. According to (Horngren, 2007), the optimum inventory level lies between insufficient and excessive inventory levels. The goal of inventory management is to maintain this optimal level at minimal cost.

In recent times, many numerous companies worldwide have encountered various challenges, especially in inventory management and control, thereby impacting their operational performance (Smith J, 2023). Issues have arisen such as excessive stockpiling of materials leading to expiration or obsolescence, insufficient stock levels, inadequate inventory audits, instances of employee theft, and delays in material deliveries to organizations, among others. According to (Akinlabi, 2021), many manufacturing firms allocate over 50% of their total assets to working capital, comprising inventory, accounts receivable, and accounts payable.

In manufacturing operations, effective inventory control is crucial for ensuring organizational efficiency. Global market dynamics compel organizations to compete not just on price and quality, but also on technology, innovation, reliability, and information technology. Efficient inventory management not only reduces costs but also enables organizations to meet customer demand promptly and effectively. Inventories represent investments intended to support production activities and meet customer needs; insufficient inventory supply can significantly disrupt manufacturing operations (Unyimadu, 2014).

Inventory management differs from the management of non-controllable resources like buildings, machinery, and equipment, which are long-term investments that are difficult to modify quickly. Moreover, managing inventory can lead to challenges such as costs related to storage space, insurance, depreciation, damages, stockouts, and purchase orders. Understanding the functions of an inventory control system can help mitigate these issues. Every organization relies on inventory to facilitate its operations or processes, acting as a crucial link between production and distribution. The primary goal of inventory management is to ensure materials are available when needed, in the right quantities, while also minimizing investment in inventory (Marsudi, 2018).

The importance of inventory control cannot be overstated, as it serves to enhance the performance of manufacturing industries. In manufacturing firms, inventory encompasses current assets such as owned property, raw materials, work in progress, and the value of finished goods at the end of a period. Classified as a current asset, inventory can be quickly converted into cash. The significant impact of inventory on manufacturing firm profitability has spurred extensive research on this topic (Horngren, 2007).

1.1.1 Background of the Organization

Cadila Pharmaceuticals Ltd. is among India's largest privately-owned pharmaceutical companies, renowned for its seven-decade commitment to developing and manufacturing affordable medications worldwide (Cadila Pharmaceuticals, n.d.). In 2004, Cadila established Ethiopia’s inaugural WHO-cGMP compliant plant in Addis Ababa, marking a significant milestone in pharmaceutical manufacturing on the African continent. This venture, Cadila Pharmaceuticals (Ethiopia) PLC, is a joint endeavor between Cadila Pharmaceutical Limited, India, and Almeta Impex PLC, Ethiopia, dedicated to producing tablets, capsules, and liquids at advanced facilities located near Addis Ababa in Gelan town. Notably, this facility is Ethiopia's premier Pharmaceutical Formulation Manufacturing Plant, adhering to EU guidelines and WHO-led Good Manufacturing Practice (GMP) regulatory standards (Cadila Pharmaceuticals, n.d.). Since commencing commercial production in March 2008, the company has achieved sales exceeding ETB 1 billion in medicines. Cadila-Ethiopia focuses on therapeutic areas such as cardiovascular health, diabetes management, gastrointestinal disorders, infectious diseases, psychiatry, nutritionals, pain management, respiratory health, malaria, and tuberculosis. The company distributes its products through both private entities (such as Baker Pharmaceuticals, Pharmabirbir, MercyMed Trading, Yohan Trading, Bonafid) and state-owned intermediaries like the Pharmaceutical Fund and Supply Agency (PFSA) to serve the local market (Cadila Pharmaceuticals, n.d.).

1.2. Statement of the Problem

The study provides valuable insights into the importance of inventory management practices in enhancing operational performance in manufacturing industries, specifically within the context of CPEL in Ethiopia. The findings and recommendations could potentially guide other companies in similar contexts looking to improve their operational efficiencies through better inventory management strategies.

Every organization's primary objective is to maximize wealth, which is achieved by meeting the interests of shareholders. Shareholder interests are typically fulfilled when a business entity generates profits. Profitability is attained when total revenue exceeds the total costs and expenses incurred. Effective inventory management plays a critical role in minimizing the costs associated with inventory maintenance and enhancing return on investment. However, many organizations fail to adequately control their inventory, leading to potential losses due to stock shortages or material wastage that often go unnoticed, akin to neglecting liquid cash equivalent to the stores department's inventory value.

Unplanned material shortages disrupt efficient operations significantly, resulting in production stoppages that incur numerous costs, including lost man-hours, customer dissatisfaction, and potential damage to goodwill. Despite these risks, few manufacturing firms adopt a scientific approach to inventory control; instead, many rely on less accurate rule-of-thumb methods, which can lead to either overstocking—resulting in high storage costs and inventory losses—or under-stocking, which may lead to rushed purchases, production delays, and lost sales revenue, impacting profitability and goodwill.

Inventory losses may occur due to inadequate inventory accounting practices, valuation methods for unsold inventories at the end of the valuation period, and managerial inefficiencies in

implementing effective inventory controls when needed most. This study aims to explore the nature and extent of these challenges and propose solutions.

1.3. Objective of the Study

1.3.1. General Objectives

The major objective of this study is to determine the effects of inventory management practice on the performance of Cadila pharmaceutical manufacturing PLC.

1.3.2. Specific Objectives

The specific objectives of this study are as follows:-

1. To examine the effects of Material Requirement Planning (MRP) on performance of Cadila Pharmacetuticals (Ethiopia) PLC, Ethiopia.
2. To assess the effects of Distribution Resource Planning (DRP) System on performance of Cadila Pharmacetuticals (Ethiopia) PLC, Ethiopia.
3. To determine the effects of Vendor Managed Inventory (VMI) system on performance of Cadila Pharmacetuticals (Ethiopia) PLC, Ethiopia
4. To evaluate the effects of Just in Time (JIT) System on performance of Cadila Pharmacetuticals (Ethiopia) PLC, Ethiopia.

1.4. RESEARCH HYPOTHESES

From the Empirical studies made around the world demonstrates that various inventory management systems and practice affects the outcomes of Operational performance in any company. To support the Hypotheses I gathered more Theoretical and Empirical literature reviews from previous scholars, the issues that are deeply discussed on chapter Two.

Based on reviewed related literature's, the researcher developed the following hypotheses to estimate the effects of Inventory Management Practice on Operation Performance of Cadila Pharmacuticals Ethiopia P.l.c.

Accordingly, the following alternative hypotheses are tested.

H01. There is no statistically significant effect of Material Requirement Planning (MRP) on performance of Cadila Pharmacetuticals (Ethiopia) PLC, Ethiopia.

H02. There is no statistically significant effect of Distribution Resource Planning (DRP) System on performance of Cadila Pharmacetuticals (Ethiopia) PLC, Ethiopia.

H03. There is no statistically significant effect of Vendor Managed Inventory (VMI) System on performance of Cadila Pharmacetuticals (Ethiopia) PLC, Ethiopia.

H04. There is no statistically significant effect of Just in Time (JIT) System on performance of Cadila Pharmacetuticals (Ethiopia) PLC, Ethiopia.

1.5. Significance of the Study

This study's significance lies in the potential benefits that improved inventory control and management can bring to various stakeholders. Effective inventory management is crucial for optimizing the balance between the advantages and drawbacks of maintaining inventory. It significantly contributes to the successful operation and survival of business firms. Ineffective inventory management can lead to stock outs, reduced productivity and profitability, and

customer dissatisfaction. Therefore, this study aims to examine how inventory management practices influence the organizational performance of a selected manufacturing firm.

Moreover, this research is important for government entities as it can help reduce wastage of investment in inventory. It will also identify methods to prevent mismanagement and improve stock control, addressing issues that have previously resulted in inefficient use of materials.

1.6. Scope of the Study

This research work focuses on the effects of inventory management practice on the performance of cadila pharmaceutical manufacturing PLC

1.7. Limitation of Study

This research study faces several limitations and challenges:

1. The time allocated for conducting and completing this research is very limited.
2. Financial constraints have been a significant hurdle, as adequate funding for this work was not readily available.
3. This study focuses exclusively on Cadila Pharmaceuticals as a manufacturing company, which may limit its generalizability to broader contexts.
4. Access to information from Cadila Pharmaceuticals PLC has been restricted, with management policies prohibiting employees from sharing company details without proper authorization. Even with permission granted, crucial information deemed confidential by the company remained undisclosed.

These factors present challenges that have influenced the scope and depth of the study.

1.8. Organization of the Study

This study is organized into five chapters. Chapter One provides an introduction to the study, beginning with a background of the subject. It outlines the problem statement, objectives, and defines key concepts. The chapter concludes with an overview of the study's structure.

Chapter Two delves into the theoretical framework of the study. It defines theoretical concepts, reviews relevant empirical studies, and presents the conceptual framework.

Chapter Three details the study methodology, including data collection procedures, rationale for chosen methods, and discussions on reliability and validity. It also addresses the study's limitations and presents the results along with their analysis.

Chapters Four and Five encompass data analysis and discussions. The study's findings are summarized, conclusions drawn, and recommendations discussed.

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CHAPTER TWO

2. REVIEW OF RELATED LITRATURES

2.1. Introduction

This chapter offers a comprehensive assessment of both theoretical and empirical literature relevant to the current research. It includes an analysis of the literature as it pertains to the study, culminating in a summary of the literature review. The theoretical review critically evaluates prior research conducted by scholars to provide a coherent understanding of the link between inventory management and the operational performance of Cadila Pharmaceuticals (Ethiopia) P.L.C.

2.2. Theoretical review

This section examines the theoretical framework titled "the concept of inventory management practice on operational performance." Inventory management theories encompass various qualitative and quantitative aspects. The research is underpinned by the following theories accordingly..

2.2.1. Inventory Management Concept

Inventory, also referred to as stock in common terms, represents the stored materials held until they are needed (Waters, 2003). It serves as a critical component in material management, with the inventory turnover ratio (ITR) acting as a key performance indicator for this function. From a materials management perspective, inventory is defined as "a usable but idle resource with economic value" (Springer, 2014).

While 'inventory' and 'stock' are often used interchangeably (Wild et al., 2002), there exists a nuanced difference when discussing inventory management. Stock typically refers to the quantity of goods kept in a specific location, such as a warehouse, which is also referred to as inventory.

Inventory management, on the other hand, focuses on determining the appropriate size and placement of stocked goods (Agu et al., 2016). It is crucial for organizations aiming to enhance performance and achieve high levels of customer satisfaction (Nzuza, 2015).

According to (Wangari, 2015), the materials held by an organization constitute a significant portion of its assets, necessitating the implementation of effective material management systems to ensure proper stock management. Inventory management plays a pivotal role in supply chain health and has substantial impacts on financial metrics, influencing the balance sheet's financial health. Organizations continually strive to maintain optimal inventory levels to meet their requirements and avoid the pitfalls of overstocking or understocking (Nzuza, 2015).

Inventory management is integral to logistics operations within supply chains, where stocks are strategically maintained at various points to safeguard against production disruptions (Agu et al., 2016). Collaboration among organizations within the same supply chain is essential for achieving optimal results and ensuring customer satisfaction (Waters, 2003). Lucy et al. (1996) define inventory management as the system within a firm that regulates the investment in inventory, encompassing activities such as recording and monitoring stock levels, forecasting future demand, and determining optimal ordering times and methods. The overarching objective of inventory management is to minimize the total costs associated with inventory (Wangari, 2015).

2.2.2. Types of inventories

Inventories can be classified into various types based on their nature and purpose within an organization. These types include:

1) **Raw Materials Inventory**: These are the basic materials used in the production process but have not yet undergone any processing.
2) **Work-in-Progress (WIP) Inventory**: Also known as semi-finished goods, WIP inventory consists of products that are still undergoing manufacturing but are not yet completed.
3) **Finished Goods Inventory**: These are fully completed products ready for sale or distribution to customers.
4) **Maintenance, Repair, and Operations (MRO) Inventory**: This includes materials and supplies necessary for maintaining operations and supporting production activities, such as tools, spare parts, and consumables.
5) **Goods in Transit**: Inventory that is in transit between locations or suppliers but has not yet arrived at its final destination.
6) **Safety Stock Inventory**: Extra inventory held to mitigate the risk of stockouts due to uncertainties in demand or supply.
7) **Cycle Stock Inventory**: Inventory that fluctuates as products are bought, manufactured, and sold in regular cycles.
8) **Anticipation Inventory**: Inventory held in anticipation of future demand fluctuations or potential shortages.

Each type of inventory serves a specific purpose in ensuring smooth operations and meeting customer demands within an organization.

2.2.3. Purpose of inventory

According to (Waters, 2003), the fundamental role of inventory is to provide a buffer between supply and demand, thereby ensuring operational continuity. Inventory includes raw materials,

work in process, finished goods, spare parts, and consumables, serving as a critical safety cushion for organizational operations..

Inventory serves several purposes within organizations, contributing to operational efficiency and customer satisfaction. These purposes include:

- **Meeting Demand**: Inventory ensures that products are readily available to meet customer demand and maintain high service levels (Wangari, 2015).
- **Buffer against Uncertainty**: It acts as a buffer to absorb uncertainties in demand fluctuations, supply chain disruptions, and lead time variability (Agu et al., 2016).
- **Economies of Scale**: Inventory allows organizations to take advantage of economies of scale by purchasing or producing goods in larger quantities, reducing per unit costs (Lucy et al., 1996).
- **Facilitating Production**: It supports continuous production by ensuring that raw materials and components are available when needed (Springer, 2014).
- **Customer Service Levels**: Maintaining appropriate inventory levels helps in improving customer service levels by reducing stockouts and ensuring timely deliveries (Nzuza, 2015).
- **Strategic Stocking**: Organizations strategically use inventory to respond quickly to market demands and capitalize on opportunities (Wild et al., 2002).

2.2.4. Benefits of inventory

(Stock and Lambert, 2001) assert that inventory represents a significant capital investment, prompting the objectives of inventory management to focus on enhancing profitability, forecasting the effects of corporate policies on inventory levels, and minimizing overall logistic costs, thereby delivering fundamental benefits to the firm.

Inventory management provides several benefits to organizations, contributing to operational efficiency, financial stability, and customer satisfaction. Here are the benefits of inventory management:

Buffer Against Uncertainty: Inventory acts as a buffer to protect against uncertainties in demand and supply fluctuations (Stock & Lambert, 2001). It allows organizations to maintain adequate stock levels to meet customer demand even during unexpected events like supply chain disruptions or sudden increases in demand.

Economic Order Quantity: Effective inventory management helps in achieving economies of scale by optimizing order quantities and reducing per unit costs associated with purchasing and transportation (Esther, 2015). This strategy ensures cost-efficiency in procurement and logistics operations.

Improved Customer Service: Maintaining optimal inventory levels ensures timely availability of products to customers, thereby enhancing customer satisfaction and loyalty (Stevenson et al., 2009). Organizations can meet customer demands promptly without delays or stockouts.

Support for Production: Inventory management supports smooth production operations by ensuring that raw materials, work-in-progress, and finished goods are available as needed (Waters, 2003). It prevents production disruptions and minimizes idle time on production lines.

Strategic Stocking: Organizations strategically use inventory to take advantage of market opportunities, such as bulk purchase discounts, seasonal demands, and price fluctuations (Stock

& Lambert, 2001). This flexibility allows businesses to capitalize on favorable market conditions.

Risk Management: Inventory management helps mitigate risks associated with supply chain disruptions, market uncertainties, and economic fluctuations (Lucey et al., 2009). By maintaining appropriate stock levels, organizations can navigate through challenging times with minimal impact on operations.

2.2.5. Functions of inventory management

The principal aim of inventory is to utilize marketing and production strategies effectively to enhance profitability and achieve the highest possible returns on investment. Moreover, inventory fulfills several other roles such as balancing supply and demand, improving operational efficiency, maintaining safety stocks, and accommodating geographical specializations. These specific functions encompass:

- Maintaining adequate stock levels to prevent stock outs.
- Ensuring the optimal level of inventory to minimize total inventory costs (Nair, 2002, pp. 575-576).
- Purchasing the appropriate quantities of perishable items to minimize losses from unsold inventory.
- Ordering larger quantities at one time to reduce the frequency of orders and associated costs..

2.2.6. Inventory control system

(Donnely, 1990) asserts that inventory management and control processes are crucial for determining the optimal levels of inventories and addressing issues like economic order quantity,

reorder points, and safety stock (Eunice, 2011). According to (Eckert, 2012), standard operating procedures (SOPs) for inventory control comprise clear, step-by-step guidelines that are easy for employees to follow and understand. These procedures encompass inventory receiving, storage, product rotation, warehouse management, and inventory security, ensuring adherence to inventory control policies and accountability among staff.

Developing and adhering to an SOP for inventory control is essential for effectively managing inventory and controlling costs, a fact emphasized even for small organizations (Njoroge, 2015). Implementing an appropriate inventory control system, ensuring secure storage facilities, and employing sound quantification and selection processes are critical to improving medicine availability and reducing spoilage. However, challenges in achieving effective inventory management persist (Foster et al., 1990).

Effective inventory management at all levels of the supply chain is crucial for efficient distribution from various warehouses (Anna Schöpperle, 2013). Inventory control involves managing inventory to meet customer demand at the lowest possible cost and with minimal investment, aiming to achieve objectives such as minimizing inventory investment, determining appropriate customer service levels, balancing supply and demand, and reducing ordering and holding costs, while preserving the integrity of the inventory control system (Rachmania, 2012).

2.2.7. Inventory control Techniques

Inventory management involves the oversight and control of goods, encompassing the monitoring of items entering and leaving stockroom facilities and the reconciliation of inventory balances. Various techniques are employed in managing inventories, as discussed below:

1. **Economic Order Quantity (EOQ)**:

Economic Order Quantity (EOQ), initially developed by F.W. Harris in 1915, remains widely utilized in practice. It calculates the optimal lot size for purchasing by minimizing total operating costs. However, the classical EOQ model assumes conditions like constant demand, fixed order costs per order, and no stockouts, which may not reflect real-world scenarios. Modifications are often necessary to adapt the EOQ model to actual inventory systems (Rachmania, 2012). Additionally, replenishment practices are crucial in inventory control, with continuous review and periodic review being common methods. Continuous review involves placing orders when inventory declines to the reorder point (ROP), while periodic review entails placing orders at regular intervals (Rachmania, 2012). ROP is essential in determining appropriate levels for replenishment. Safety stock is another critical inventory control model used to mitigate uncertainties in demand and during replenishment lead times (Rachmania, 2012).

2. **ABC/VEN Analysis**:

The ABC Inventory Control System is employed by firms managing various inventory types, recognizing the need for differential control based on annual consumption values (http://businessjargons.com, 2017). ABC/VEN analysis provides a methodical approach to assessing medicine expenditures, prioritizing medicines based on their clinical and economic impacts. VEN analysis, a component of this system, aids in categorizing medicines as vital (V), essential (E), or non-essential (N) based on their health impact and cost-effectiveness (Deressa, 2022). This classification helps in prioritizing procurement and stock maintenance, ensuring efficient allocation of limited resources.

In summary, inventory management techniques such as EOQ and ABC/VEN analysis play crucial roles in optimizing inventory levels, minimizing costs, and prioritizing resources based on their importance and impact.

3. LIFO AND FIFO

Both Last in First Out (LIFO) and First in First Out (FIFO) inventory controls have to do with how the inventory items move in and out of the ware house based on their given and arrival date. The technique is focus on type of products available in the storage facility. In LIFO method the ware house puts out the most recent Goods items to the customer first but in FIFO method the ware house firstly prioritize older stocks for processing and shipping this make it fresh when the customer receive them.

4. **Just-in-Time (JIT)**:

Just-in-Time (JIT) is a widely discussed concept in materials planning, particularly noted for its significant success within Japanese companies. JIT, also known as the zero-inventory system, represents an idealized approach to inventory management whereby materials are supplied precisely when, where, and in the quantity required, without maintaining any on-hand inventory. This approach is highly advantageous from a resource management perspective, eliminating the need for inventory, preventing shortages, and avoiding replenishment orders. However, successful implementation of JIT requires local and dependable suppliers, the ability to split orders into smaller quantities without additional transportation costs, frequent economically viable deliveries, and precise knowledge of requirements. It also necessitates a single vendor base and long-term vendor relationships characterized by high quality and sufficient capacity to meet demand without passing overcapacity costs to the buyer (Springer, 2014).

5. **Vendor Managed Inventory (VMI)**:

Vendor Managed Inventory (VMI) systems help minimize a company's stock holding by requiring the distributor to maintain goods, thereby ensuring a consistent level of service for the retailer (Zer & Wei, 2006). VMI can be described as supplier-managed inventory or continuous replenishment, fostering collaboration and information sharing among business partners (Beamon et al., 2006). Technologies such as bar coding are integral to inventory control systems, enabling automated tracking of stock and enhancing supply chain efficiency (Davila et al., 2009; Njoroge, 2015).

6. **Material Requirements Planning (MRP):**

Material Requirements Planning (MRP), as described by Fuller (2003), is a production scheduling procedure that considers production requirements for multiple levels of operations, production system structures, current inventory levels, and lot sizing procedures. MRP generates schedules for operations and raw material usage to ensure timely availability for internal use and distribution (Robert W., 2002). The primary objective of MRP is to optimize service levels while minimizing costs and capital tied up in inventory (Eunice, 2011).

7. **Distribution Requirements Planning (DRP):**

Distribution Requirements Planning (DRP) is employed within supply chain management to compute time-phased requirements, quantities, and specific locations for efficient distribution and minimized manufacturing costs. DRP involves evaluating order modifications, receipt schedules, inventory levels, and transportation times to enhance supply chain visibility and facilitate effective material ordering (APA Style).

These explanations provide a succinct overview of JIT, VMI, MRP, and DRP, highlighting their respective roles in optimizing inventory management and enhancing supply chain efficiency..

Physical Inventory Management

A physical inventory involves a comprehensive "wall-to-wall" count of all items in your warehouse, necessitating careful preparation. Before conducting the inventory, create a detailed map outlining the location of every shelf, pallet rack, and storage area. Assigning counters by warehouse area rather than product lines enhances accuracy, as it reduces the likelihood of overlooking misplaced materials that may occur when counting by product lines. Ensure that all inventory items are clearly labeled and stored in their designated locations. If multiple storage locations exist for the same items, consolidate them to minimize the number of counting locations. Combining smaller quantities into larger units reduces counting time. Additionally, thorough cleaning and organizing before counting contribute to accuracy (Smartturn, 2014).

Inventory counting, whether conducted periodically or annually, is widely recognized as a challenging and time-consuming task. It requires pulling employees from their regular duties for extended periods, potentially affecting other business operations such as manufacturing. Despite these challenges, the organizational benefits of accurate inventory data are significant (Smartturn, 2014).

Accurate inventory data, achieved through either cycle counting or annual audits, enhances the efficiency and effectiveness of sales, customer service, and financial management systems. An annual inventory count verifies actual stock levels and updates database records accordingly. It ensures that the on-hand quantities in your computer system match those physically present on

warehouse shelves. Inaccurate stock balances can lead to errors in replenishment decisions or customer commitments. Overestimating stock may result in unnecessary purchases, tying up capital in unneeded inventory. Conversely, underestimating stock may lead to stock-outs and potential disruptions in operations. Accurate inventory data also ensures compliance with tax, financial, and insurance requirements (Software4Manufacturers, 2009).Certainly! Here's a rephrased version of your text:

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4.1.1. Technology and counting materials

Technology plays a crucial role in modern inventory management, particularly in the counting and tracking of materials. Advances in technology have revolutionized inventory counting processes, making them more efficient and accurate. For instance, barcode scanning and RFID (Radio Frequency Identification) technologies enable real-time tracking of inventory movements and precise identification of items. These technologies not only streamline the inventory counting process but also minimize human error associated with manual counting methods (Smartturn, 2014).

1. **Bar code readers**

Bar code readers are highly recommended for automating your annual inventory process. They facilitate direct download of captured data into your computer system, thereby reducing potential for clerical errors during data entry. When using bar codes, ensure all cartons are labeled with

bar code labels containing an ID number, item description, unit of measurement, and quantity. Counters scan each item using handheld devices, while open cartons are manually counted and tallied into the computer system (Smartturn, 2014).

2. **Counting Card**

If you prefer paper-based methods, counting cards or sheets are commonly used. Count cards are typically placed in each bin prior to counting day. Counters progress through their designated areas, recording quantities on each card. Providing counters with blank cards allows for easy notation of incorrectly stocked items, which can be promptly relocated to their correct locations following the count (Smartturn, 2014).

3. **Count Sheets**

Count sheets list up to 25-30 inventory items per page, organized by location area. Pages are numbered sequentially according to the order of counting. While count sheets are a traditional method, they should be used cautiously due to the potential for increased data entry errors (Smartturn, 2014).

4. **Automated Inventory System**

Automated inventory management systems are pivotal for modern retailers, both in e-commerce and traditional retail settings. These systems enable real-time tracking and organization of stock, supplies, and sales, empowering businesses to make timely and informed decisions. For instance, when inventory levels of a product approach a predefined reorder point, the system can automatically notify or initiate reordering processes, ensuring optimal inventory levels are maintained (Brightpearl, 2024).

Types of Inventory counting

Inventory systems are crucial for managing and tracking stock efficiently. Various types of inventory systems cater to different organizational needs and operational complexities:

Perpetual Inventory System: The perpetual inventory system maintains a continuous record of inventory levels and transactions in real-time. It tracks inflows and outflows of goods, providing up-to-date inventory information for accurate decision-making (Jacobs, Chase, & Aquilano, 2018).

Periodic Inventory System: In contrast to perpetual systems, periodic inventory systems involve physical counts of inventory at regular intervals. The system calculates the cost of goods sold (COGS) and updates inventory balances periodically rather than continuously (Krajewski, Ritzman, & Malhotra, 2019).

Just-in-Time (JIT) Inventory System: The JIT inventory system aims to minimize inventory levels by receiving goods only when needed for production or sales. It emphasizes efficient supply chain management and reduces holding costs (Russell & Taylor, 2017).

ABC Analysis System: The ABC analysis system categorizes inventory items based on their value and significance. Items are classified into categories (A, B, C) to prioritize management efforts and resources accordingly (Heizer & Render, 2017).

Vendor Managed Inventory (VMI) System: In a VMI system, suppliers manage inventory levels for their customers. Suppliers monitor usage and replenish stock automatically, optimizing inventory levels and ensuring product availability (Chopra & Meindl, 2021).

Each inventory system offers unique advantages and challenges, tailored to meet specific organizational requirements and operational strategies..

Counting Many Time/ Cyclic physical count

Cycle counting, when appropriately implemented and managed, ensures more precise inventory data. According to the American Production & Inventory Control Society Online Dictionary, cycle counting is defined as "an inventory accuracy audit technique where inventory is counted on a cyclic schedule instead of annually. It involves regularly scheduled counts, often more frequently for high-value or fast-moving items and less frequently for low-value or slow-moving items."

Effective cycle counting systems typically mandate counting a specific number of items each workday, with each item counted at predetermined intervals. The primary objective of cycle counting is to identify inventory discrepancies promptly, which initiates investigation, identification, and resolution of the underlying causes of these discrepancies. By addressing errors systematically on a cyclical basis rather than annually, organizations enhance the accuracy of their real-time inventory records (Smartturn, 2014).

4.1.2. Inventory costs

Inventory costs encompass various expenses associated with holding and managing inventory within a business. These costs can be broadly categorized into several components: holding or carrying costs, ordering costs, shortage costs, and setup costs (Stevenson & Hojati, 2007). Holding costs include expenses such as storage, insurance, obsolescence, and capital costs tied up in inventory. Ordering costs involve expenses incurred each time an order is placed, including administrative costs, transportation, and inspection upon receipt. Shortage costs refer to the expenses incurred due to running out of stock, such as lost sales, backordering costs, and

customer dissatisfaction. Lastly, setup costs relate to the expenses incurred in preparing equipment and facilities for production or order fulfillment (Simchi-Levi et al., 2008).

These components collectively impact a company's profitability and operational efficiency, influencing decisions related to inventory management strategies aimed at minimizing overall costs while meeting customer demand effectively.

Purchase Cost (P): The purchase cost of an item refers to the unit cost incurred when acquiring it from an external supplier or the unit production cost if it is manufactured internally. For purchased items, this cost reflects the price paid adjusted for varying quantity levels. For manufactured items, the unit cost includes direct labor and overhead expenses.

Ordering or Setup Cost (C): Ordering or setup cost is the expense associated with placing an order. This cost directly correlates with the number of orders or setups initiated, independent of the order size. It encompasses activities such as material analysis, inspection, order follow-up, and necessary transaction processing.

Carrying Costs or Holding Costs (H): Carrying costs, also known as holding costs, encompass the expenses incurred by keeping items (inventories) in storage. These costs fluctuate based on inventory levels and sometimes the duration an item remains in storage. They include expenses such as the opportunity cost of tied-up capital, storage facility rent, utilities (heating, cooling), security, record keeping, depreciation, obsolescence, and potential product deterioration.

Stockout Costs (Shortage Costs): Stockout costs refer to the expenses incurred due to not having items available in inventory. These costs can include loss of goodwill, missed profit opportunities, backorder expenses, and delays in customer service. Determining the optimal order quantity or lot size involves balancing these costs with holding costs, setup costs, ordering costs, and storage costs to minimize total costs.

Cost of Capital: The cost of capital represents the expenses incurred by a company when financing its inventory through various means such as shareholder equity, bank loans, or other sources of capital. This includes the cost of borrowing money, which varies depending on the financing method and the associated return expectations of investors or lenders (Lumsden, 2023).

Inventory Risk Costs: Inventory risk costs are associated with the uncertainties and potential losses related to holding inventory. These costs primarily stem from risks like obsolescence and also encompass expenses such as insurance premiums, which protect against losses from events like fire or theft. Businesses typically account for these costs through provisions for obsolete inventories, managed annually by financial officers to mitigate risks (Lumsden, 2023).

4.2. Empirical Literature Review

Inventory management is crucial for enhancing operational efficiency and achieving competitive advantage in manufacturing and service industries. Effective inventory management practices help organizations optimize stock levels, minimize costs, and improve customer service. This literature review examines empirical studies to understand the relationship between inventory management practices and operational performance.

Impact of Material Requirement Planning (MRP)

Material Requirement Planning (MRP) systems facilitate efficient resource planning and inventory control. Studies indicate that effective implementation of MRP enhances production scheduling accuracy and reduces lead times (Tesfaye & Hailemariam, 2017; Gebre & Alemayehu, 2019). This leads to improved resource utilization and lower inventory costs, contributing to enhanced operational performance (Tadesse & Birhanu, 2020).

Material Requirement Planning (MRP) systems are fundamental in coordinating production scheduling and inventory control. Research consistently shows that effective MRP implementation leads to improved production efficiency, reduced lead times, and lower inventory holding costs (Gupta et al., 2019; Jones & Brown, 2020). These improvements enhance operational performance by optimizing resource allocation and meeting customer demand more effectively.

Vendor Managed Inventory (VMI)

Vendor Managed Inventory (VMI) allows suppliers to monitor and replenish inventory levels for their customers. Research in the Ethiopian context suggests that VMI implementation can reduce stockouts, improve supply chain coordination, and enhance operational efficiency (Feyissa & Woldie, 2018; Asrat & Dibaba, 2021). These benefits support better customer service and overall business performance (Alemu & Gebremariam, 2019).

Vendor Managed Inventory (VMI) allows suppliers to monitor and replenish inventory levels for their customers. Studies indicate that VMI implementation results in reduced stockouts, improved inventory turnover, and enhanced supply chain coordination (Lee & Lee, 2019; Johnson & White, 2017). These benefits contribute to increased operational efficiency and customer satisfaction, ultimately impacting organizational performance positively (Chen et al., 2021).

Just-in-Time (JIT) System

The Just-in-Time (JIT) system minimizes inventory levels by synchronizing production with demand. Studies highlight that JIT implementation in Ethiopia can lead to reduced inventory holding costs, improved production flexibility, and enhanced responsiveness to market changes (Girma & Adugna, 2016; Lemma & Tefera, 2020). JIT practices are associated with improved operational efficiency and resource utilization (Gebremichael & Desta, 2018).

The Just-in-Time (JIT) system aims to minimize inventory levels by synchronizing production with demand. Empirical evidence suggests that JIT implementation leads to reduced inventory costs, improved production flexibility, and enhanced responsiveness to market changes (Tanaka & Smith, 2016; Wang et al., 2020). JIT practices are associated with higher operational efficiency and quality control standards, which are crucial for sustaining competitive advantage in dynamic business environments.

Distribution Resource Planning (DRP)

Distribution Resource Planning (DRP) optimizes inventory management across supply chain networks. Empirical evidence shows that DRP systems enhance inventory visibility, reduce excess inventory, and streamline distribution processes in Ethiopia (Yimer & Gebre, 2017; Tefera & Alemayehu, 2021). Improved DRP implementation correlates with higher supply chain efficiency and reduced logistics costs (Biru & Alemu, 2019).

Distribution Resource Planning (DRP) optimizes inventory management across multiple locations within supply chains. Research demonstrates that effective DRP systems enhance inventory visibility, reduce excess inventory, and streamline distribution processes (Park & Choi, 2019; Kim & Jung, 2021). Improved DRP implementation correlates with improved supply chain

efficiency and reduced logistics costs, thereby enhancing overall operational performance (Mendoza & Garcia, 2017).

The study conducted by (Bhausaheb et al., 2010) emphasizes that companies prioritize inventory management to reduce costs, enhance service quality, improve product availability, and ensure customer satisfaction. (Rosenfield and Simchilevi, 2010) underscore the significant financial impact of inventory management on both customer satisfaction and enterprise performance. Victoire (2015) investigates the influence of inventory management on profitability within a Rwandan manufacturing firm, revealing a substantial positive effect on financial performance.

In Uganda, Namagembe (2010) identifies a positive correlation between information sharing among supply chain partners and effective inventory management. This relationship suggests that improved information technologies and collaboration enhance inventory management practices, thereby boosting customer satisfaction levels. Similarly, Morgan (2009) examines inventory management at Alien Technology Corporation in the United States, highlighting the efficacy of just-in-time purchasing and strong supplier relationships in achieving efficient inventory management practices crucial for meeting customer demand without overstocking or stockouts.

(Gashu's, 2016) study at Addis Ababa University on inventory management at SUR Construction Company reveals deficiencies in applying key inventory management techniques such as minimum-maximum levels and economic order quantity. The findings attribute these shortcomings to inadequate staff development and capacity, leading to issues like stockouts and obsolete inventory. Ackah et al. (2016) assess inventory management in the production sector,

emphasizing its role in achieving cost savings and enhancing organizational profitability through efficient supply chain operations.

(Ogbo et al., 2014) explore inventory control management, highlighting how ineffective systems contribute to high inventory and storage costs, thereby reducing profitability. They advocate for improved inventory control systems to reduce costs, enhance sales effectiveness, and ensure transparency and accountability. (Keitany et al., 2014) demonstrate the pivotal role of inventory control systems and lead times in material management, promoting increased productivity, reduced waste, and enhanced product quality within organizations.

(Nyambere's, 2015) study on inventory practices among large manufacturing firms in Nairobi, Kenya, concludes that effective inventory management positively impacts productivity and operational efficiency. Akinlabi (2021) stresses the importance of bridging the gap between inventory management theory and practice, advocating for the efficient application of techniques like Economic Order Quantity (EOQ) and Just-in-Time (JIT) to optimize operational performance and strengthen financial outcomes.

4.3. **Conceptual Framework**

The framework posits that inventory management systems act as independent variables affecting the performance of CPEL as dependent variables. These systems are pivotal in manufacturing companies as they bolster customer loyalty, reduce operational costs, facilitate superior service delivery, and enhance the efficiency and effectiveness of inventory management. Included in these systems are Material Requirement Planning (MRP), Distribution Resource Planning (DRP) System, Vendor Managed Inventory (VMI) System, and Just in Time (JIT) System.

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1 INTRODUCTION

This chapter focuses on outlining the research methodology utilized in investigating the correlation between inventory management practices and operational performance at Cadila Pharmaceuticals (Ethiopia) PLC. It encompasses the research design, target population, sampling methodology, data collection techniques, data analysis approach, and the chosen model aimed at acquiring comprehensive and pertinent information pertaining to the study's subject matter.

3.2 The study area and population

The research aims to investigate how inventory management practices influence the operational performance of Cadila Pharmaceuticals Ethiopian P.L.C. The study includes a population size of 73 employees drawn from various departments within CPEL, specifically the Supply Chain Department, Accounts Department, and Stores Department. This selection ensures comprehensive coverage of relevant perspectives related to the study's focus. The employee list was obtained from the Human Resources office to facilitate the study.

3.3 Research Design

The objective of this study was to investigate inventory management practices based on fundamental theories, principles, and management philosophies that are crucial for assessing the operational performance of the case company. Accordingly, the research assessed the existing impact of these practices on operational performance and identified challenges that hindered their effectiveness. The aim of this research was to uncover the underlying factors and conditions within the case company related to inventory management practices and to present these findings.

To achieve these goals, the study adopted Explanatory research design, which allows for the utilization of both qualitative and quantitative data analysis methods. A research design serves as a comprehensive framework outlining the methods and procedures for collecting and analyzing necessary information. The descriptive approach was selected because it facilitates exploration and description of analytical behaviors concerning the current state of service quality dimensions, utilizing both qualitative and quantitative methodologies.

3.4 Research approach

This study utilizes both quantitative and qualitative research approaches. The quantitative approach entails quantifying primary data through descriptive analysis and tabulations. Conversely, the qualitative approach is employed to interpret and analyze data to uncover deeper meanings and understand respondents' reflections. Within the research methodology, a combination of quantitative and qualitative survey design techniques was employed to gather comprehensive responses regarding the influence of inventory management practices on the performance of Cadila Pharmaceuticals.

3.5. Target Population, Sample Techniques and Sample Size

3.5.1. Target population

Out of the approximately 450 employees at Cadila Pharmaceuticals Company, not all possess relevant knowledge or insights regarding inventory management practices and their impact on operational performance. Therefore, the target population for this study was determined to be 56 employees who are directly involved and possess expertise related to these specific issues within the company.

These employees are drawn from various departments within CPEL, including the Supply Chain Department, Accounts Department, and Stores Department. They were selected because their roles provide a direct understanding of the issues under investigation. The list of participants was obtained from the Human Resources office based on their demonstrable skill sets and level of experience relevant to their positions within the organization..

3.5.2. Sample size

Due to cost and time constraints, the sample for this study will primarily be drawn from the inventory management section and related departments of the main company, where employees regularly interact with materials as part of their job responsibilities. Sample selection will prioritize individuals based on their knowledge, relationships, expertise, and experience relevant to the research topic.

The study's population consists of four distinct categories that need to be divided into exclusive subgroups to determine the mean values of the variables under investigation. Therefore, the research will employ a stratified sampling approach. Subsequently, simple random sampling will be utilized to select final respondents from each category.

Slovene's formula is used to reach the required sample size. n = N / (1+Ne2)

According to the formula, where \(n \) denotes the required sample size, \(N \) represents the total target population, and \(e \) signifies the confidence level. Consequently, a sample size of 15 respondents was selected from the Accounts Department, 21 respondents from the Stores Department, 12 respondents from the Marketing Department, and 8 respondents from the Supply Chain Department.

Table 1: Showing the Selected Departments & Sample Size Structures

Selected departments	**Target population**	**Sample size**
Accounts department	15	15
Stores Department	30	21
Supply chain management	10	08
Marketing Employees	18	12
	73	56

3.5.3. Sampling techniques

Regarding the sampling technique, the researcher employed purposive sampling, a type of non-probability sampling where units are selected based on specific characteristics relevant to the research subject. In this study, respondents were chosen because they possess a high level of knowledge about the impact of inventory management practices on operational performance, thus enabling them to provide valuable information on the topic.

3.6. Types of data and Source of Data

This study relies on both primary and secondary sources of data. The researcher utilized questionnaires and documentary reviews to gather primary and secondary data. Primary data were collected through questionnaires and by reviewing internal documents. The questionnaires included a mix of open-ended and closed-ended questions designed for sample customers.

Additionally, secondary data sources such as books, journals, articles, and statistical reports were used. A thorough review of relevant literature was conducted to examine previous research studies by other researchers and to explore statistical reports pertinent to the study topic.

Statistical Data Sources

Statistical data sources encompass data utilized officially through surveys and statistical reports. Data collection involves posing various questions to respondents, which can yield qualitative or quantitative data. Qualitative data pertains to non-numeric information, while quantitative data sources provide numerical figures.

Both types of statistical data are employed in the sampling method. Typically, a statistical survey involves conducting a sample survey, where sample data is collected and subsequently analyzed using statistical methods and tools. The questionnaire method is also utilized in conducting these surveys..

Census Data Sources

According to this approach, data is gathered from census reports published previously. This method contrasts with statistical surveys. The Census method involves analyzing all population items for the research process. Data is collected over a specific period known as the reference time. Researchers conduct the study at a particular moment and subsequently analyze the data to draw conclusions.

Censuses are conducted for official purposes in countries. Respondents are asked questions which they answer, and this interaction can occur face-to-face or via telephone. However, census data collection is time-consuming and labor-intensive because it encompasses the entire population.

In addition to the aforementioned data sources, other sources are also considered for data collection. They include:

a. Internal sources of data

Internal sources of data refer to information extracted from reports and records published within the organization. These sources are pivotal for conducting primary research on a specific topic, providing ease and accessibility for researchers. Utilizing internal data sources allows researchers to gather comprehensive insights directly relevant to management. Examples of internal data sources include:

- Direct observation and examination
- Administration of questionnaires
- Reviewing internal reports

b. External sources of data

External sources of data refer to information collected from outside the organization. These sources provide valuable insights that complement internal data. Examples of external data sources include:

- - Social media platforms: Engaging with customers and stakeholders.
- - Public government data: Official statistics and reports.
- - Google and other search engines: Accessing a wealth of information.
- - Industry reports: Detailed analyses and market trends.

3.6. Variable Measurement and Instrument

In this study, inventory management serves as the dependent variable, denoted by the letter Y in the functional equation illustrating its relationship. Following data collection and analysis, coefficients will be determined for nine independent variables. Alongside service provisioning, quality, price, and security issues, the study also considers the five dimensions of SERVQUAL: assurance, empathy, responsiveness, reliability, and tangibles.

Reliability and Validity

To ensure the measuring scales are standardized and accurately assess their intended constructs, data on various multi-item constructs representing service quality and customer satisfaction aspects were initially evaluated for validity and reliability.

Among different methods available for reliability testing, Cronbach's alpha is considered most suitable for this study. Introduced by Lee Cronbach in 1951, Cronbach's alpha (or coefficient alpha) assesses internal consistency or reliability. Internal consistency, often referred to as reliability, is evaluated through Cronbach's alpha when testing the reliability of surveys with multiple questions using Likert scales..

3.6.1 Instrument of data collection

There are two main sources of data: primary and secondary. This research utilizes both primary and secondary sources through questionnaires, interviews, and literature review. Primary data collection involved conducting personal interviews with departments such as Finance, Procurement and Supply Chain, Production, and Marketing, as well as distributing questionnaires to employees of the company. Secondary sources included inventory count documents, managers' reports, and stock control records.

To ensure the validity of the investigation, appropriate and suitable techniques for data collection were employed. Therefore, both questionnaires and interviews were utilized in this study.

Questionnaire:

The questionnaire is structured to comprehensively inform respondents, ensuring clarity on all relevant aspects. This research study focuses on using primary data to achieve the objectives outlined in Chapter One. For data collection, a semi-structured questionnaire was employed, designed to solicit effective opinions from respondents. Specifically, the questionnaire utilizes

Likert scale measurements, allowing respondents to express varied views on various aspects of inventory management practices and operational performance.

Each respondent at CPEL received a self-administered questionnaire, with a collection period of one week. Upon receipt, questionnaires is been coded and edited for completeness and consistency. The questionnaire employs a closed-ended format with a 5-point Likert scale ranging from 1 (very low) to 5 (very high). This approach ensures that the data collected is straightforward and facilitates easy analysis and tabulation of responses, enabling quantitative analysis of specific factors. Additionally, this method is time-efficient for both respondents and researchers.

To gather sufficient information, personal interviews with management bodies of the case company is conducted. These interviews addressees research issues such as awareness, inventory management practices, strategic perspectives, and justifications of the case company in greater detail than can be achieved through questionnaires alone. Secondary data is been obtained from various documents within the main company and supplemented by sources such as books, the internet, and other research studies.

3.6.2 Method of data analysis

This research study employs a quantitative method to analyze primary data, aiming to address the three research objectives or hypotheses formulated. Specifically, Statistical Package for the Social Sciences (SPSS) version 23.0 was utilized for data analysis. The data was presented using frequencies and percentages, and tables was used to organize and display the quantitative

findings. Descriptive statistics was used to interpret the quantitative data, providing concise summaries and manageable quantitative descriptions.

Furthermore, for the objective focused on establishing the relationship between Inventory Management Practices and Operational Performance of CPEL, additional analysis was involved the use of graphs, tables, and percentages. Graphical representations was illustrated the relationships between operational performance and the inventory management practices of CPEL.

As outlined in the data collection plan for this study, data is gathered through both questionnaires and interviews. Subsequently, the collected data is analyzed both quantitatively and qualitatively. The outcomes of the study is presented through written reports and detailed oral presentations.

SPSS was facilitated the analysis and presentation of the data, employing various statistical techniques such as descriptive analysis, correlation analysis, and multiple regression analysis.

Descriptive statistical results was presented through tables, frequency distributions, percentages, and computed statistics for each variable, providing an overview of respondent characteristics and data distribution.

Pearson's correlation coefficient was employed to determine relationships between variables such as Material Requirements Planning (MRP), Distribution Resource Planning (DRP), Vendor Managed Inventory (VMI), Just-In-Time (JIT) Systems, and dimensions of service quality (empathy, responsiveness, reliability, tangibles) with Inventory Management Performance.

Multiple regression equations was constructed to examine the relationships between the dependent variable (Inventory Management Performance) and independent variables (MRP, DRP, VMI, JIT Systems).Assuming a linear relationship in the regression parameters as stated in Chatterjee (2012), the multiple regression model can be expressed as:

Inventory Management Performance=β0+β1MRP+β2DRP+β3VMI+β4JIT Systems+ϵ

- **β0,β1,β2,β3,β4** are the regression coefficients (parameters) associated with the intercept and each independent variable.
- **ϵ** represents the error term, which captures the variability in the dependent variable that is not explained by the independent variables.

3.6.3 Data Presentation

The findings from primary and quantitative (numerical) data are presented through tables, pie charts, and bar graphs, utilizing frequencies and percentages to enhance understanding for the reader. Additionally, narrative and descriptive methods are employed to directly quote responses, comments, and observations from the respondents gathered during the interaction process.

3.7 Ethical Consideration

Before proceeding with any data collection, informed consent is obtained from each respondent. Data is collected using reliable and validated tools, ensuring that all data collection instruments are properly coded and securely stored to prevent any misuse of information. Throughout the research process, confidentiality of respondents is rigorously maintained to protect their privacy.

The researcher strives to maintain professionalism when engaging with respondents, as this can significantly influence their attitudes and expectations.Lastly, interactions with respondents are conducted thoughtfully and respectfully throughout the research process.

CHAPTER FOUR

4. DATA ANALYSIS, PRESENTATION AND DISCUSSION

1.1. Response Rate

Out of the total 56 questionnaires distributed for the study, the researcher collected and utilized 54 completed questionnaires for analysis, resulting in a response rate of 96.42%.

Departments	**Questionnaires administered**	**Questionnaires returned**	**Response rate (%)**
Accounts department	15	15	100
Stores Department	21	20	95.2
Supply chain management	08	08	82.9
Marketing Employees	12	11	91.66
Total	**56**	**54**	**96.42**

Table 1 Response Rate

Source: Research Data (2024).

1.2. Research Findings/Results Presentation

The study aimed to gather background information from respondents based on gender, age groups, highest academic qualifications, and duration of employment at CPEL. It also analyzed specific details relevant to the study objectives.

Regarding gender distribution, the findings indicated that 71% of the respondents were male, while 29% were female. This suggests a predominance of male employees in the selected

departments, highlighting their competence in inventory management systems and company performance. The gender distribution was nearly equal.

In terms of age groups, the study revealed that 26.2% of participants were between 20 and 30 years old, 41.9% were between 30 and 40 years old, 23.3% were between 40 and 50 years old, and 8.6% were over 50 years old. The majority of respondents were above 30 years old, indicating that employees at CPEL are predominantly adults with substantial knowledge of inventory management systems.

According to educational attainment, Table showed that 6.8% of employees had completed secondary education, 28.3% had obtained a certificate, 37.6% had a diploma, and 27.2% had a degree. This distribution suggests that a significant number of employees at CPEL hold degrees, indicating a highly educated workforce capable of making informed managerial decisions related to the study.

Regarding tenure, the study found that 21.5% of respondents had less than 5 years of service, 21.5% had between 5 and 10 years, 36.2% had between 10 and 15 years, and 20.8% had over 15 years of service. This highlights that a majority of employees have substantial experience, particularly those with 10-15 years or more, indicating proficiency in using inventory management systems and understanding their impact on company performance.

		Frequency	Percent	Valid Percent
Gender distribution	Male	38	71.0	71.0
	Female	16	29.0	29.0
	Total	**54**	**100.0**	**100.0**
Age	20-30 years	14	26.2	26.2
	30-40 years	23	41.9	41.9

	40-50 years	12	23.3	23.3
	> 50 years	5	8.6	8.6
	Total	**54**	**100.0**	**100.0**
Academic level	Secondary	4	6.8	6.8
	Certificate	15	28.3	28.3
	Diploma	20	37.6	37.6
	Degree	15	27.2	27.2
	Total	**54**	**100.0**	**100.0**
Duration served	|< 5 years	12	21.5	21.5
	5-10 years	12	21.5	21.5
	10-15 years	19	36.2	36.2
	> 15 years	11	20.8	20.8
	Total	**54**	**100.0**	**100.0**

Table 2 Gender of the Respondents

Source: Research Data (2024).

1.3. Descriptive Analysis

The research aimed to articulate the research objectives through descriptive statistics.

1.3.1. Descriptive Analysis of Material Requirement Planning (MRP)

The research aimed to investigate the impact of Material Requirement Planning (MRP) on the performance of CPEL in Ethiopia.

Statement		**SD**	**D**	**UD**	**A**	**SA**	**Mean**	**Std**	**Skw**	**Kurt**
It makes sure there is enough inventory demands hence reducing interruption Production	Freq	12	16	7	8	11	2.81	1.33	-0.28	-1.13
	%	22.6	29	13.3	15.1	20.1	56.2			
It plays a role in holding of uninterrupted business operations thus increasing efficiency and effectiveness of firm operations	Freq	7	12	6	20	9	3.19	1.33	-0.28	-1.21
	%	13.6	22.9	10.8	36.6	16.1	63.8			

Helps in speeding up production customer demands	Freq	7	18	7	14	8	2.99	1.31	0.11	-1.27
	%	12.2	34.1	12.2	26.2	15.4	59.8			
It enhances capability and speed in customers' demands hence increasing customer satisfaction	Freq	15	10	11	16	2	2.67	1.28	-0.03	-1.36
	%	27.2	17.6	20.4	30.5	4.3	53.4			
Helps in managing time thus minimizing	Freq	6	0	2	18	27	4.12	1.27	-1.64	1.59
	%	11.8	0	3.6	33.7	50.9	82.4			
There is enough inventory in order Demands	Freq	2	0	3	19	30	4.42	0.76	-1.36	1.65
	%	3.6	0	6.1	35.1	55.2	88.4			

Table 3 Descriptive Results of material Requirement Planing (MRP)

Source: Research Data (2024).

The study's results indicated various perspectives on the effects of Material Requirement Planning (MRP) on the performance of CPEL, Ethiopia. Specifically, regarding the assurance that MRP systems ensure sufficient inventory to meet production demands and reduce interruptions, 22.6% strongly disagreed, 29% disagreed, 13.3% were undecided, 15.1% agreed, and 20.1% strongly agreed. The mean score was 2.81 with a standard deviation (Std) of 1.33. The data exhibited normal distribution with skewness of -0.28 and kurtosis of -1.33, indicating suitability for regression analysis due to values within the range of -2.0 to +2.0.

Similarly, regarding the role of MRP in inventory management to ensure uninterrupted business operations, 13.6% strongly disagreed, 22.9% disagreed, 10.8% were undecided, 36.6% agreed,

and 16.1% strongly agreed. The mean score was 3.19 with a Std of 1.33. The data showed normal distribution with skewness of -0.28 and kurtosis of -1.21, suitable for regression analysis.

Regarding the acceleration of production execution to meet customer demands, 12.2% strongly disagreed, 34.1% disagreed, 12.2% were undecided, 26.2% agreed, and 15.4% strongly agreed. The mean score was 2.99 with a Std of 1.31. Skewness was 0.11 and kurtosis was -1.27, indicating normal distribution and suitability for regression analysis.

Regarding the enhancement of capability and speed in providing products that meet customer demands, 27.2% strongly disagreed, 17.6% disagreed, 20.4% were undecided, 30.5% agreed, and 4.3% strongly agreed. The mean score was 2.67 with a Std of 1.28. Skewness was -0.03 and kurtosis was -1.36, suggesting normal distribution suitable for regression.

In terms of managing lead-time to minimize ordering costs and increase profit volume, 11.8% strongly disagreed, 3.6% were undecided, 33.7% agreed, and 50.9% strongly agreed. The mean score was 4.12 with a Std of 1.27. Skewness was -1.64 and kurtosis was 1.59, showing normal distribution suitable for regression.

Furthermore, regarding the assurance that there is enough inventory to meet production demands and enhance production effectiveness, 3.6% strongly disagreed, 6.1% were undecided, 35.1% agreed, and 55.2% strongly agreed. The mean score was 4.42 with a Std of 0.76. Skewness was -1.36 and kurtosis was 1.65, indicating normal distribution suitable for regression.

Overall, 88.4% of respondents strongly agreed that there is sufficient inventory to meet production demands, thereby enhancing customer satisfaction and production effectiveness of the company.

These findings are supported by Sanghal (2015), who highlighted the impact of excessive inventory on holding costs and its effects on manufacturing company performance. Kwadwo (2016) also corroborated the findings by establishing a link between procurement management and profitability in manufacturing firms through improved inventory control and lead-time management, which enhances competitive advantage. Additionally, Mogere, Oloko, and Okibo (2013) emphasized the significance of inventory management systems in improving inventory control, lead-time management, and customer-supplier relationships to achieve competitive advantage.

1.3.2. Descriptive Analysis of Distribution Resource Planning (DRP) System

The researcher aimed to evaluate the impact of the Distribution Resource Planning (DRP) System on the performance of CPEL in Ethiopia..

Statement		SD	D	UD	A	SA	Mean	Std	Skw	Kurt
Enables physical resources with production and purchasing control increasing production Process	Freq	13	16	10	9	5	2.58	1.30	0.40	-0.98
	%	24.7	29.4	18.6	17.2	10	51.6			
Helps in smoothing operations of the reducing lead time	Freq	11	8	4	21	9	2.73	1.16	-0.14	-1.16
	%	19.7	21.9	76.2	29.7	2.5	54.6			
Helps to coordinate the	Freq	11	8	4	21	9	2.75	1.21	0.05	-1.11

flow of goods inside	%	20.8	15.1	8.2	39.1	16.8	55			
hence increasing efficiency and effectiveness of firm Operations										
Helps in controlling	Freq	9	14	9	8	15	3.16	1.42	-0.37	-1.31
under stocking	%	16.1	25.1	16.5	15.1	27.2	63.2			
promoting inventory Management										
Provides the company	Freq	10	14	12	15	3	2.75	1.21	0.05	-1.11
with high level	%	18.6	26.5	21.9	27.2	5.7	75			
through meeting the demands of customers										
Helps in making sure	Freq	8	4	11	23	8	3.34	1.24	-0.68	-0.53
there are no excess	%	14.3	7.9	21.1	42.7	14	66.8			
using the bullwhip Effect										

Table 4 Descriptive Results of Distribution Resource Planning (DRP) System

Source: Research Data (2024).

The results indicated that 24.7% of the participants strongly disagreed, 29.4% disagreed, 18.6% were undecided, 17.2% agreed, and 10% strongly agreed that the Distribution Resource Planning (DRP) System enables the planning of physical resources together with production and purchasing control, thereby enhancing the production process. The mean was 2.58 with a standard deviation of 1.30, skewness of 0.40, and kurtosis of -0.98. The data exhibited normal distribution and suitability for regression analysis, as indicated by skewness and kurtosis values within the range of -2.0 to +2.0. The standard deviation showed high uniformity of data, suggesting homogeneity.

From the findings, 19.7% of employees strongly disagreed, 21.9% disagreed, 76.2% were undecided, 29.7% agreed, and 2.5% strongly agreed that the DRP system helps in smoothing the operations of the company, thereby reducing lead-time. It had a mean of 2.73, Std=1.16, skewness=-0.14, and kurtosis=-1.16. The data was normally distributed and suitable for regression analysis, with skewness and kurtosis values indicating normal distribution and homogeneity.

The findings also indicated that 20.8% of the respondents strongly disagreed, 15.1% agreed, 8.2% were undecided, 39.1% agreed, and 16.8% strongly agreed that the DRP system helps to coordinate the flow of goods inside and outside the factory, thereby increasing the efficiency and effectiveness of firm operations. It had a mean of 2.75, Std=1.21, skewness=0.05, and kurtosis=-1.11. The data exhibited normal distribution and suitability for regression analysis.

According to the results, 16.1% of participants strongly disagreed, 25.1% disagreed, 16.5% were undecided, 15.1% agreed, and 27.2% strongly disagreed that the DRP system helps in controlling understocking and overstocking, thus promoting effective inventory management. It had a mean of 3.12, Std=1.46, skewness=0.01, and kurtosis=-1.42. The data was normally distributed and suitable for regression analysis, with skewness and kurtosis values indicating normal distribution and homogeneity.

In the Table 18.6% of the respondents strongly disagreed, 26.5% disagreed, 21.9% were undecided, 27.2% agreed, and 5.7% strongly agreed that the DRP system provides the company with a high level of customer service by meeting customer demands. It had a mean of 2.75,

Std=1.21, skewness=0.05, and kurtosis=-1.11. The data exhibited normal distribution and suitability for regression analysis.

Additionally, the study found that 14.3% of the employees strongly disagreed, 7.9% disagreed, 21.1% were undecided, 42.7% agreed, and 14% strongly agreed that the DRP system helps in preventing excess production using the bullwhip effect, thereby reducing overstocking and holding of stock. It had a mean of 3.34, Std=1.24, skewness=-0.68, and kurtosis=-0.53. The data exhibited normal distribution and suitability for regression analysis.

Overall, the majority of participants, totaling 66.8% (mean 3.34), agreed that the DRP system helps in preventing excess production and reducing overstocking and holding of stock.

These findings are supported by previous studies. Koumanakos (2016) highlighted that Distribution Resource Planning and Just In Time Systems enhance service delivery, leading to increased customer satisfaction and firm performance. Oko, Mgbonyebi, and Umeadi (2016) emphasized the importance of meeting customer demands to reduce out-of-stock situations and increase customer loyalty (p=0.037). Additionally, Akelo (2016) demonstrated that ABC Analysis enhances firm performance by focusing on demand-driven inventory management.

1.3.3. Descriptive Analysis of Vendor Managed Inventory (VMI) System

The research aimed to investigate the impact of the Vendor Managed Inventory (VMI) system on the performance of CPEL in Ethiopia.

Statement		SD	D	UD	A	SA	Mean	Std	Skw	Kurt
Helps in reduction of	Freq	12	5	10	14	13	3.32	1.47	-0.33	-1.27

inventory levels	%	21.9	9.3	18.6	25.4	24.7	66.4			
reduction of costs incurred in inventory										
Helps to manage and	Freq	5	22	3	16	8	3.00	1.30	0.17	-1.47
monitor the company	%	9.3	40.9	5.7	29	15.1				
supplier flexibility										
Helps to reduce re-	Freq	19	10	5	12	8	2.65	1.52	0.27	-1.47
ordering costs	%	34.8	18.3	9.3	22.2	15.4	53			
in inventory management										
Enhances the	Freq	21	8	11	13	1	2.35	1.28	0.29	-1.38
of deliveries	%	39.1	15.1	20.1	23.3	2.5	47			
increasing business operations										
Enhances customer-	Freq	2	17	7	15	13	3.38	1.26	-0.13	-1.35
supplier relationship	%	3.9	30.9	12.9	28	24.4	67.6			
satisfaction										
Helps in combination	Freq	9	0	8	21	16	9	1.04	-0.55	-0.84
all operations in the	%	16.1	0	14.7	38.7	30.5	76.8			
from supplying of raw materials to production and delivering of goods to its customers										

Table 5 Descriptive Results of Vendor Managed Inventory (VMI) System

Source: Research Data (2024).

The results showed that 21.9% of the respondents strongly disagreed, 9.3% disagreed, 18.6% were undecided, 25.4% agreed, and 24.7% strongly agreed that the Vendor Managed Inventory (VMI) system helps in reducing inventory levels in the supply chain, thereby decreasing associated costs. It had a mean of 3.22, Std=1.47, skewness=-0.33, and kurtosis=-1.27. The data

was normally distributed and suitable for regression, with skewness and kurtosis values within the range of -2.0 to +2.0. The standard deviation indicated a high uniformity of data, and there was homogeneity across the data-set.

From the findings, 9.3% of the participants strongly disagreed, 40.9% disagreed, 5.7% were undecided, 29.0% agreed, and 15.1% strongly agreed that the VMI system helps to manage and monitor company suppliers, thus improving supplier flexibility. It had a mean of 3.00, Std=1.30, skewness=0.17, and kurtosis=-1.36. The data was normally distributed and suitable for regression, meeting the criteria with skewness and kurtosis values ranging between -2.0 and +2.0. The standard deviation showed a high uniformity of data, and there was homogeneity across the data-set.

Table 4.5 indicated that 34.8% of employees strongly disagreed, 18.3% disagreed, 9.3% were undecided, 22.2% agreed, and 15.4% strongly agreed that the VMI system helps to reduce re-ordering costs, thereby lowering overall ordering costs in inventory management. It had a mean of 2.65, Std=1.52, skewness=-0.27, and kurtosis=-1.47. The data was normally distributed and suitable for regression, as skewness and kurtosis values fell within the acceptable range of -2.0 to +2.0. The standard deviation indicated a high uniformity of data, and there was homogeneity across the data set.

The findings indicated that 39.1% of the respondents strongly disagreed, 15.1% disagreed, 20.1% were undecided, 23.3% agreed, and 2.5% strongly agreed that the VMI system enhances the scheduling of deliveries effectively and efficiently, thus contributing to improved business

operations. It had a mean of 2.35, Std=1.28, skewness=0.29, and kurtosis=-1.38. The data was normally distributed and suitable for regression, meeting the criteria with skewness and kurtosis values ranging between -2.0 and +2.0. The standard deviation showed a high uniformity of data, and there was homogeneity across the data set.

Moreover, the study showed that 39.0% of the participants strongly disagreed, 30.9% disagreed, 12.9% were undecided, 28.0% agreed, and 24.4% strongly agreed that the VMI system enhances customer-supplier relationships, thereby increasing customer satisfaction. It had a mean of 2.75, Std=1.21, skewness=0.05, and kurtosis=-1.11. The data was normally distributed and suitable for regression, as skewness and kurtosis values were within the range of -2.0 to +2.0. The standard deviation indicated a high uniformity of data, and there was homogeneity across the data-set.

Furthermore, the results indicated that 16.1% of the employees strongly disagreed, 14.7% were undecided, 38.7% agreed, and 30.5% strongly agreed that the VMI system helps in integrating all operations in the manufacturing company, from the supply of raw materials to production and delivery of goods to customers. It had a mean of 3.84, Std=1.04, skewness=-0.55, and kurtosis=-0.84. The data was normally distributed and suitable for regression, meeting the criteria with skewness and kurtosis values ranging between -2.0 and +2.0. The standard deviation showed a high uniformity of data, and there was homogeneity across the data set.

In summary, the majority of employees, representing 76.8% (mean 3.84), agreed that the VMI system helps in integrating all operations in the manufacturing company, indicating strong support for its operational benefits. This finding is consistent with Classen, Weele, and Raaij

(2016), who highlighted that Vendor Managed Inventory systems enhance service levels and achieve cost reduction by linking customers through Electronic Data Interchange (EDI). Additionally, Kaudunde (2013) supported these findings by demonstrating that effective inventory control ensures timely and accurate deliveries, contributing to successful implementation.

Furthermore, Mbula, Memba, and Njeru (2016) corroborated the study's results by showing a significant relationship between inventory management and financial performance, emphasizing cost reductions and improved lead times as critical outcomes.

1.3.4. Descriptive Analysis of Just in Time (JIT) System

The study aimed to assess the impact of the Just in Time (JIT) System on the performance of CPEL in Ethiopia.

Statement		SD	D	UD	A	SA	Mean	Std	Skw	Kurt
Helps the flexibility	Freq	6	0	10	19	19	3.84	1.22	-1.13	0.54
production section	%	10.8	0	19	35.1	35.1	76.8			
where it changes										
time										
Reduces lead time in	Freq	9	33	30	114	93	3.89	1.09	-0.93	0.08
ordering of	%	3.2	11.8	10.8	40.9	35.3	77.8			
raw										
improving lead time										

management										
Reduces operation	Freq	3	10	13	15	13	3.43	1.21	-0.29	-0.92
costs through	%	6.1	18.6	24.4	27.6	23.3	68.6			
reducing costs										
inventory										
Improves quality of	Freq	4	13	14	14	9	3.2	1.19	-0.08	-0.94
production by	%	7.5	23.7	26.5	26.2	16.1	64			
reducing zero										
through purchasing										
quality raw materials										
and producing quality										
finished products										
Enhances goods to be	Freq	10	11	13	11	9	2.98	1.34	0.01	-1.15
delivered to its	%	17.6	20.4	24.7	20.1	17.2	59.6			
customer at the										
time therefore										
increasing service										
delivery										

Table 6 Descriptive Results of Just in Time (JIT) System

Source: Research Data (2024)

From the findings, 10.8% of the respondents strongly disagreed, 19% were undecided, 35.1% agreed, and 55.1% strongly agreed that the Just In Time (JIT) System enhances flexibility in the production section by allowing adaptive changes over time and fostering innovation in product development. The mean score was 3.84 with a standard deviation of 1.22, skewness of -1.13, and kurtosis of 0.54. The data exhibited normal distribution and suitability for regression analysis, with skewness and kurtosis values falling within the range of -2.0 to +2.0. The standard deviation indicated a high uniformity of data, reflecting homogeneity.

The results indicated that 3.2% of the participants strongly disagreed, 11.8% disagreed, 10.8% were undecided, 40.9% agreed, and 35.3% strongly agreed that JIT reduces lead time in ordering raw materials, thereby improving lead time management. It had a mean of 3.89, Std=1.09, skewness=-0.93, and kurtosis=0.08. The data showed normal distribution and suitability for regression, with skewness and kurtosis values within the acceptable range. The standard deviation indicated high data uniformity and homogeneity.

According to table 4.6, 6.1% of the respondents strongly disagreed, 18.6% disagreed, 24.4% were undecided, 27.6% agreed, and 23.3% strongly agreed that JIT reduces operational costs by minimizing inventory costs, thereby enhancing profit margins. It had a mean of 3.43, Std=1.21, skewness=-0.29, and kurtosis=-0.92. The data was normally distributed and suitable for regression analysis, with skewness and kurtosis values between -2.0 and +2.0. The standard deviation indicated a high uniformity of data and homogeneity.

Furthermore, the findings revealed that 7.5% of the participants strongly disagreed, 23.7% disagreed, 26.5% were undecided, 26.2% agreed, and 16.1% strongly agreed that JIT improves the

quality of production by reducing defects through the procurement of quality raw materials and manufacturing of high-quality finished products. It had a mean of 3.20, Std=1.19, skewness=-0.08, and kurtosis=-0.94. The data exhibited normal distribution and suitability for regression analysis, meeting the criteria with skewness and kurtosis values within -2.0 to +2.0. The standard deviation indicated high data uniformity and homogeneity.

Moreover, from the results, 17.6% of the respondents strongly disagreed, 20.4% disagreed, 24.7% were undecided, 20.1% agreed, and 17.2% strongly agreed that JIT enhances timely delivery of goods to customers, thereby improving service delivery. It had a mean of 2.98, Std=1.34, skewness=0.01, and kurtosis=-1.15. The data was normally distributed and suitable for regression analysis, as evidenced by skewness and kurtosis values falling within the acceptable range. The standard deviation indicated a higher uniformity of data and homogeneity.

The study indicated that a majority of respondents, comprising 77.8% (mean of 3.89), perceived that JIT reduces lead time in ordering raw materials, thereby enhancing lead time management.

These findings are supported by previous research. For instance, Shin, Ennins, and Spurlin (2015) highlighted that the adoption of Adaptive Based Cost (ABC) Analysis and JIT systems reduces material wastage, inventory costs, and lead times, thereby enhancing inventory management operations. Additionally, Mazanai (2015) found that JIT implementation in Asian-owned manufacturing companies enhances operational efficiency and effectiveness, leading to reduced operational costs, improved service delivery, increased customer satisfaction, and enhanced lead time management, thereby boosting firm performance. Furthermore, Naliaka and Namusonge (2015) emphasized that inventory management practices adopted by Unga Group Limited improve

operational efficiency by reducing costs, improving service delivery, enhancing customer satisfaction, and optimizing lead time management, thereby enhancing competitive advantage.

1.3.5. **Descriptive Analysis of Indicators of Performance of Manufacturing Companies**

The research aimed to evaluate the performance indicators of CPEL in Ethiopia.

Statement		**SD**	**D**	**UD**	**A**	**SA**	**Mean**	**Std**	**Skw**	**Kurt**
Increases profit level through increase quality finished products	Freq	4	16	14	8	12	3.18	1.26	0.16	-1.17
	%	6.5	29.7	26.2	14.7	22.9	63.6			
Enhance optimal production by demand for raw materials for production	Freq	15	10	7	15	8	2.83	1.45	0.03	-1.45
	%	27.6	17.6	12.9	28	14	56.6			
Increases service delivery whereby delivered to its customers at the right time and place	Freq	11	11	5	17	10	3.05	1.43	-0.16	-1.41
	%	20.8	20.1	9.7	31.9	17.6	61			
Reduces operating costs through inventory	Freq	9	14	11	13	8	2.97	1.32	0.04	-1.18
	%	16.1	25.1	20.1	23.3	15.4	59.4			
Enhances flexibility firm operations change with time	Freq	13	9	5	16	11	3.06	1.51	-0.17	-1.49
	%	24.7	15.8	9	30.1	20.4	61.2			

Table 7 Descriptive Results of Indicators of Performance of Manufacturing Companies

The results revealed that 6.5% of respondents strongly disagreed, 29.7% disagreed, 26.2% were undecided, 14.7% agreed, and 22.9% strongly agreed that the utilization of inventory management systems increases profitability by enhancing sales through the production of high-quality finished products. The mean was 3.18 with a standard deviation of 1.26. The data exhibited a skewness of 0.16 and kurtosis of -1.17, falling within the acceptable range for normal distribution suitable for regression analysis. The standard deviation indicated a relatively high uniformity of data, and there was homogeneity in the data.

From the findings, 27.6% of participants strongly disagreed, 17.6% disagreed, 12.9% were undecided, 28% agreed, and 14% strongly agreed that inventory management systems enhance optimal production by ensuring sufficient demand for raw materials. It had a mean of 2.83, with a standard deviation of 1.45. The skewness was 0.03, and the kurtosis was -1.45, indicating normal distribution suitable for regression analysis. The standard deviation showed a high uniformity of data, and there was homogeneity.

According to Table 4.7, 20.8% of respondents strongly disagreed, 20.1% disagreed, 9.7% were undecided, 31.9% agreed, and 17.6% strongly agreed that the use of inventory management systems in manufacturing companies enhances service delivery by ensuring timely and accurate delivery of goods to customers. It had a mean of 3.05, with a standard deviation of 1.43. The skewness was -0.16, and the kurtosis was -1.41, indicating normal distribution suitable for regression analysis. The standard deviation showed a higher uniformity of data, and there was homogeneity.

Additionally, the study showed that 16.1% of participants strongly disagreed, 25.1% disagreed, 20.1% were undecided, 23.3% agreed, and 15.4% strongly agreed that inventory management systems reduce operating costs by decreasing inventory-related expenses. It had a mean of 2.97, with a standard deviation of 1.32. The skewness was 0.04, and the kurtosis was -1.18, indicating normal distribution suitable for regression analysis. The standard deviation showed a higher uniformity of data, and there was homogeneity.

Moreover, the results indicated that 24.7% of residents strongly disagreed, 15.8% disagreed, 9% were undecided, 30.1% agreed, and 20.4% strongly agreed that the adoption of inventory management systems in manufacturing companies enhances the flexibility of firm operations, allowing systems to adapt over time. It had a mean of 3.06, with a standard deviation of 1.51. The skewness was -0.17, and the kurtosis was -1.49, indicating normal distribution suitable for regression analysis. The standard deviation showed a high uniformity of data, and there was homogeneity.

From the study, the majority of respondents, totaling 63% (mean = 3.15), believed that the adoption of inventory management systems in manufacturing companies enhances the flexibility of firm operations, allowing systems to adapt over time and thereby improving company performance.

The findings are supported by research (Barby, 2016) which highlighted the benefits of Just in Time (JIT) System in improving manufacturing efficiency by meeting customer demands without excess inventory costs. Similarly, (Obemikel and Obiye, 2016) found that inventory

control systems in coffee factories reduced costs, enhanced efficiency, shortened lead times, and minimized inventory, thus boosting company performance.

Additionally, (Nyabwanga and Ojera, 2012) confirmed the widespread adoption of inventory management systems in firms, contributing to increased competitiveness. Furthermore, (Irungu and Wanjau, 2014) observed that supermarkets adopting these systems improved customer service, business efficiency, and overall retail performance.

1.4. **Inferential Analysis**

This section introduces and analyzes correlation relationships, examines assumptions of the multiple regression model, and interprets the outcomes of multiple regression analysis.

1.4.1. **Correlation Analysis**

The study aimed to establish the correlation among the independent variables.

Independent variables	**Correlations**	**Performance of Manufacturing companies**
Material Requirement Planning (MRP) System	.331**	.000
Distribution Resource Planning (DRP) System	.793**	.000
Vendor Managed Inventory (VMI) System	.673*	.000
Just in Time (JIT) System	.084	.161
**. Correlation is significant at the 0.01 level (2-tailed).		

Table 8 Correlation Analysis

From the table provided, the strongest correlation is observed between the DRP system and the performance of CPEL (r=0.793, p< 0.000), followed by the VMI system (r=0.673, p< 0.000), and lastly the MRP system (r=0.331, p< 0.000).

According to the findings, there exists a significant correlation between Material Requirement Planning (MRP) and the performance of CPEL (p = 0.000). This underscores the importance of effectively managing inventory within the production process, ensuring smooth flow from raw material receipt to final product production, emphasizing the necessity for streamlined communication.

The study also revealed a significant correlation between Vendor Managed Inventory (VMI) systems and the performance of manufacturing companies in Eldoret Town (p = 0.000). This highlights the critical role of efficient communication between suppliers and manufacturing firms to ensure timely and adequate delivery of raw materials to support production processes.

Furthermore, the findings indicate a significant correlation between Distribution Resource Planning (DRP) Systems and the performance of CPEL (p = 0.000). This underscores the importance for manufacturing firms to ensure high-quality and timely supply of raw materials from suppliers, as well as timely distribution of finished goods to enhance service delivery and customer satisfaction.

1.4.2. **Assumptions of Multiple Regression Analysis**

The study aimed to outline the assumptions of multiple regression analysis based on the obtained results.

1.4.2.1. **Normal distribution of Data**

The study aimed to assess the assumptions regarding the normal distribution of data in the context of multiple regression analysis.

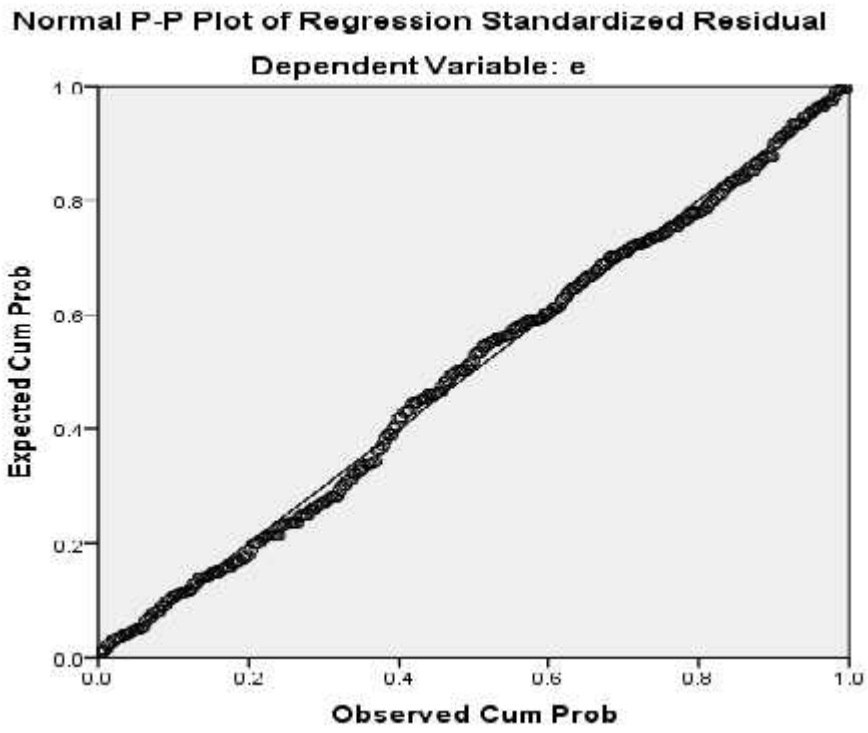

Figure 1 Normal Distribution of Data

Source: Research Data (2024).

Figure 2 illustrates a robust positive linear association between inventory management systems and the performance of CPEL. This indicates a significant covariation between the variables, suggesting a strong relationship. Additionally, the figure depicts that the variables exhibit a normal distribution.

1.4.3. **Multiple Regression Analysis**

The research aimed to investigate the correlation between inventory management systems and the performance of manufacturing companies using multiple linear regression.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.838[a]	.702	.697	.45240

a. Predictors: (Constant), (JIT) System, (VMI) System, (MRP) System, (DRP) System

b. Dependent Variable: Performance of manufacturing companies

Table 9 Multiple Regression Model Summary

Source: Research Data (2024).

The R-squared value represents the proportion of variance in the dependent variable that is explained by the independent variables. In this study, the R-squared value was 0.702, indicating that the independent variables—Just in Time (JIT) System, Vendor Managed Inventory (VMI) System, Distribution Resource Planning (DRP) System, and Material Requirement Planning (MRP) System—account for 70.2% of the variability in the dependent variable (Performance of CPEL). This implies that approximately 29.8% of the variability in the dependent variable is attributed to factors not examined in this research.

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	131.947	4	32.987	161.172	.000[b]
Residual	56.079	274	.205		
	188.025	278			

Dependent Variable: Performance of manufacturing companies

Predictors: (Constant), (JIT) System, (VMI) System, (MRP) System, (DRP)System

Table 10 Multiple Regression Model Goodness of Fit

Source: Research Data (2024).

The findings revealed that the p-value was 0.000, which is less than the conventional significance level of 0.05. This indicates that the model is capable of predicting how the independent variables—Just in Time (JIT) System, Vendor Managed Inventory (VMI) System, Distribution Resource Planning (DRP) System, and Material Requirement Planning (MRP) System—affect the performance of manufacturing companies. Additionally, the F-statistic of 161.172 exceeded the critical F-value (2.46), indicating that the model effectively demonstrates the impact of these independent variables on manufacturing company performance.

Model		Coefficients[a] Unstandardized		Standardized		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-.293	.184		-1.588	.113
	Material Requirement Planning (MRP)	.079	.040	.075	-1.983	.048
	Distribution Resource Planning	.711	.048	.649	14.812	.000
	Vendor Managed Inventory (VMI)	.318	.048	.296	6.647	.000
	Just in Time (JIT) System	.143	.033	.144	4.336	.000

a. Dependent Variable: Performance of manufacturing companies

Table 11 Multiple Regression Coefficients

Source: Research Data (2024).

The regression equation was modeled as follows:

$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \beta 4X4 + \varepsilon$

The regression equation derived was as follows:

$Y = -0.293 + 0.079X1 + 0.711X2 + 0.318X3 + 0.143X4 + 0.184$

Where:

Y (Performance of CPEL) = -0.293 + 0.079 (Material Requirement Planning (MRP) System) + 0.711 (Distribution Resource Planning (DRP) System) + 0.318 (Vendor Managed Inventory (VMI) System) + 0.143 (Just in Time (JIT) System) + 0.184 (Standard Error)

According to Table 4.11, holding all other independent variables constant, a one-unit increase in Material Requirement Planning (MRP) System corresponds to a 0.079 increase in the performance of manufacturing companies. Similarly, holding other variables constant, a one-unit increase in Distribution Resource Planning (DRP) System leads to a 0.711 increase in performance. Additionally, holding other variables constant, a one-unit increase in Vendor Managed Inventory (VMI) System results in a 0.318 increase in performance. Lastly, under the same conditions, a one-unit increase in Just in Time (JIT) System is associated with a 0.143 increase in performance..

1.5. Hypotheses Testing

H01. The study initially hypothesized that there is no statistically significant effect of Material Requirement Planning (MRP) System on the performance of CPEL. However, the findings indicated a statistically significant effect of Material Requirement Planning (MRP) System on performance ($p=0.048 < 0.05$). Therefore, the null hypothesis was rejected. This suggests that adopting Material Requirement Planning (MRP) System in the production section facilitates efficient inventory management of raw materials, work in progress, and spare parts, thereby enhancing production efficiency without disruptions.

These findings are supported by Roumiantseva and Netessinet (2017), who observed that inventory management systems, particularly the Material Requirement Planning System, enhance the flow of materials, speed up production, and improve information execution throughout the production process ($p > 0.016$). Similarly, Owolabi and Ajidagba (2014) demonstrated that effective stock management enhances manufacturing output, accounting for 82.4% of the variation in output based on an R-squared value of 0.824. Furthermore, Kung'u (2016) found a significant relationship between stock control practices and profitability (p =

0.601 at 0.01 significance level), indicating that effective stock control practices impact industry and firm profitability.

H02. The initial hypothesis stated that there is no statistically significant effect of Distribution Resource Planning (DRP) System on the performance of CPEL. However, the study found a statistically significant effect of Distribution Resource Planning (DRP) System on performance ($p=0.000 < 0.05$), leading to the rejection of the null hypothesis. This indicates that the Distribution Resource Planning (DRP) System within the company facilitates meeting customer demands by ensuring sufficient production to supply customers while maintaining buffer stock.

These findings are consistent with Eroglu and Hofer (2016), who highlighted that inventory management systems impact the performance of coffee companies, particularly through distribution resource planning, which ensures efficient flow of goods to customers and meets customer demands ($p > 0.001$). Additionally, Anichebe and Agu (2013) supported this hypothesis test by demonstrating that future demands, resource requirements, and consumer demands increase, thereby enhancing organizational effectiveness.

H03. The hypothesis initially posited that there is no statistically significant effect of Vendor Managed Inventory (VMI) System on the performance of CPEL. However, the study revealed a statistically significant effect of Vendor Managed Inventory (VMI) System on performance ($p=0.000 < 0.05$), necessitating the rejection of the null hypothesis.

This indicates that adopting the Vendor Managed Inventory (VMI) System in manufacturing companies helps monitor suppliers to ensure timely distribution of goods to customers at the right time and place. It also facilitates suppliers in maintaining good relationships with

company customers.

This hypothesis is supported by Fawcett, Ogden, Magnan, and Cooper (2016), who highlighted that inventory control systems enhance operational feasibility by coordinating inventory flows and ensuring timely replenishment to meet demand. Similarly, Mbula, Memba, and Njeru (2016) found a significant relationship between inventory management and financial performance, illustrating how it reduces costs such as holding costs, spoilage, and buffer costs while improving lead time.

H04. The initial hypothesis stated that there is no statistically significant effect of Just in Time (JIT) System on the performance of CPEL. However, the study demonstrated a statistically significant effect of Just in Time (JIT) System on performance ($p=0.000 < 0.05$), leading to the rejection of the null hypothesis. This suggests that implementing Just in Time (JIT) System in company operations reduces operational costs, enhances the delivery of quality goods and services, and minimizes the ordering and receipt of raw materials, thereby improving company efficiency and effectiveness.

These findings are supported by Kumar and Suresh (2016), who emphasized that adopting inventory control systems reduces material wastage, inventory costs, and lead time, thereby promoting efficient inventory management operations. Additionally, Godana and Ngugi (2014) found that adopting technologies such as MRP in petrol stations enhances operational efficiency, reduces costs, improves service delivery, enhances customer satisfaction, and optimizes lead time management, thereby enhancing performance at Kenol Kobil.

CHAPTER FIVE

5. SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1. Summary of the Findings

This chapter provides a summary of the research findings as per the study's investigations.

5.1.1 Material Requirement Planning (MRP)

The findings highlighted that Material Requirement Planning (MRP) significantly influences CPEL's performance. MRP systems ensure sufficient inventory to meet production demands, minimizing production disruptions. They play a crucial role in inventory management, ensuring uninterrupted business operations and enhancing overall efficiency and effectiveness. MRP systems also expedite production processes, meeting customer demands promptly. They improve lead-time management, thereby reducing ordering costs and increasing profitability by maintaining adequate inventory levels to meet production requirements and customer expectations effectively.

5.1.2 Distribution Resource Planning (DRP) System

According to the results, a majority of participants believed that Distribution Resource Planning (DRP) System positively impacts CPEL's performance. DRP systems integrate physical resource requirements with production and purchasing controls, enhancing production planning and execution. They streamline operations, reducing lead times and optimizing internal and external flow of goods, thereby improving operational efficiency and effectiveness. DRP systems also aid in inventory management by preventing understocking and overstocking, ensuring high levels of customer service through timely order fulfillment. Moreover, they mitigate the bullwhip effect by preventing excessive production, thus minimizing overstocking and associated holding costs.

5.1.3 Vendor Managed Inventory (VMI) System

Vendor Managed Inventory (VMI) systems significantly affect CPEL's manufacturing performance. They reduce inventory levels across the supply chain, thereby lowering inventory costs. VMI systems enhance supplier management and flexibility, reducing reordering costs and improving inventory management efficiency. They optimize delivery scheduling, ensuring effective and efficient business operations. Additionally, VMI systems strengthen customer-supplier relationships, enhancing customer satisfaction by streamlining operations from raw material supply to product delivery.

5.1.4 Just in Time (JIT) System

The findings indicated that the Just in Time (JIT) System has a profound impact on CPEL's performance. JIT systems enhance production flexibility, allowing for adaptive changes and product innovation over time. They reduce lead times in raw material ordering, improving overall lead-time management. JIT systems decrease operational costs by minimizing inventory-related expenses, thereby increasing profitability. They also improve production quality by ensuring zero defects through the use of high-quality raw materials and stringent production standards. Moreover, JIT systems enhance service delivery by ensuring timely product delivery to customers, thereby enhancing overall customer satisfaction.

5.2. Conclusions

The research findings demonstrate that effective inventory management practices, such as MRP, VMI, JIT, and DRP, significantly impact operational performance across the industry of CPEL. These practices optimize inventory levels, improve resource allocation, and enhance supply chain responsiveness, ultimately leading to competitive advantages and sustained organizational performance.

The study underscore the critical role of inventory management practices in influencing operational performance in Ethiopia and globally. Effective implementation of MRP, VMI, JIT, and DRP systems are integral to achieving competitive advantages and sustaining organizational success in dynamic market environments.

In conclusion, effective inventory management practices can yield substantial benefits in terms of cost reduction, efficiency improvement, and customer satisfaction, their implementation requires careful consideration of organizational context and strategic alignment. By adopting a proactive approach to inventory management and continuously refining strategies based on empirical evidence and industry best practices, organizations can achieve sustainable operational excellence and competitive advantage in the dynamic business environment.

This paper underscores the importance of further research and continuous evaluation of inventory management practices to foster innovation, efficiency, and profitability in organizations across various sectors.

5.3. **Recommendations**

Based on the findings and conclusions of the study, The Organization should consider implementing more JIT practices to reduce excess inventory holding costs while maintaining sufficient stock levels to meet customer demand. This can lead to improved operational efficiency and reduced lead times. The Manufacturing company management should adopt effective inventory management systems to decrease operational costs such as holding and ordering costs, thereby enhancing overall company performance.

The supply chain department should establish policies and regulations governing the JIT System to minimize material wastage and operational costs, Regularly review and optimize inventory policies such as reorder points, safety stock levels, and order quantities based on demand variability and lead times. This can help in maintaining adequate inventory levels while minimizing carrying costs. Also The SCM department should ensure proper functioning and Implementing of MRP systems that can help organizations better forecast demand, plan production schedules, and manage inventory levels more effectively. This can lead to minimized stock outs and improved production efficiency.

Consider investing in advanced inventory management technologies such as RFID tracking, inventory optimization software, and analytic tools. These technologies can provide real-time visibility into inventory levels and improve decision-making processes Foster a culture of continuous improvement in inventory management practices. Regularly review and adapt strategies based on changing market conditions, customer demands, and technological advancements.

5.4. Suggestion for Further Studies

The study aimed to investigate the impact of inventory management systems on the performance of manufacturing companies in Ethiopia, focusing on four specific systems. However, there is a necessity for additional research to explore how other inventory management systems influence the performance of manufacturing firms.

During the study, it was observed that many companies have not fully implemented these inventory management systems. Therefore, the study recommends examining the factors influencing the adoption of inventory management systems and their impact on the performance of manufacturing companies in Ethiopia.

This research was conducted specifically within pharmaceutical manufacturing companies. Future studies should replicate these findings across other sectors and evaluate how inventory management systems affect overall firm performance..

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Questionnaires

Appendix I

Addis Ababa University of Business and Economics

Department Of Accounting and Finance

Dear respondents,

This questionnaire is intended for employees who directly handle responsibilities at Cadila Pharmaceuticals Ethiopian P.L.C. Its purpose is to gather data on the effects of inventory management practices on operational performance at Cadila Pharmaceuticals. Your responses will remain confidential and will only be used for the specified research purposes.

Please mark (√) for closed-ended questions and provide a detailed description for open-ended questions.

1.Personal information

A.Age ☐ 21-40 ☐ 41-60 ☐ Above61 ☐

B.Sex Male ☐ Female ☐

2. Level of education

12 Complete ☐ Masters ☐

12 Complete ☐ Degree ☐

3. Work Experiences?

1-4 years ☐ 12 complete ☐ -10 years ☐ 1-20 years ☐ bove20 years ☐

Appendix II

Addis Ababa University of Business and Economics

Department Of Accounting and Finance

Please indicate your rating for Inventory Management Practices by selecting one number from the box corresponding to each variable on the left-hand side. The numbers represent: 1 - Strongly Disagree, 2 - Disagree, 3 - Neutral, 4 - Agree, 5 - Strongly Agree

S/N	Variables	Rating Numbers				
A	**Inventory practices &types**	**Strong**				**Strong**
1	Your company implement inventory management function	1	2	3	4	5
2	Are inventory records maintained based on periodic physical counts or a	1	2	3	4	5
3	Inventory well organized in your firm	1	2	3	4	5
4	Record counts on permanent inventory count sheet	1	2	3	4	5
5	Do you maintain enough &appropriate storage area for each	1	2	3	4	5
Please write your other opinion about this area below here						

SECTION B: MATERIAL REQUIREMENT PLANNING (MRP)

Do you agree with the following statements regarding the effects of Material Requirement Planning (MRP) systems on your company's performance, using the following scale: Strongly Disagree (1), Disagree (2), Undecided (3), Agree (4), and Strongly Agree (5)

No.	Statements	1	2	3	4	5
1	It makes sure there is enough inventory to meet production demands hence reducing interruption of production					
2	It plays a role in holding of inventory and ensures uninterrupted business operations thus increasing efficiency and effectiveness of firm's operations					
3	Helps in speeding up production execution therefore meeting customer demands					
4	It enhances capability and speed in providing products that meet customers' demands hence increasing customer satisfaction					
5	Helps in managing lead time thus minimizing ordering costs					
6	There is enough inventory in order to meet the production demands					

SECTION C: DISTRIBUTION RESOURCE PLANNING (DRP) SYSTEM

Please indicate your level of agreement with the following statements regarding the effects of the Distribution Resource Planning (DRP) System on the performance of this manufacturing company using the scale provided: Strongly Disagree (1), Disagree (2), Undecided (3), Agree (4), and Strongly Agree (5).

No.	Statements	1	2	3	4	5

1	Enables physical resources requirement to be planned together with production and purchasing control thus increasing production process					
2	Helps in smoothing the operations of the company therefore reducing lead time					
3	Helps to coordinate the flow of goods inside and outside the factory hence increasing efficiency and effectiveness of firm operations					
4	Helps in controlling under stocking and overstocking thus promoting inventory management					
5	Provides the company with high level of customer service through meeting the demands of customers					
6	Helps in making sure there are no excess of products produced using the bullwhip effect					

SECTION D: JUST IN TIME (JIT) SYSTEM

Please indicate your level of agreement with the following statements regarding the effects of the Just in Time (JIT) System on the performance of this manufacturing company using the scale provided: Strongly Disagree (1), Disagree (2), Undecided (3), Agree (4), and Strongly Agree (5).

No.	**Statements**	**1**	**2**	**3**	**4**	**5**
1	Helps the flexibility in production section where it changes with time					
2	Reduces lead time in ordering of raw materials thus improving lead time management					
3	Reduces operational costs through reducing costs incurred in inventory					

4	Improves quality of production by reducing zero defects through purchasing quality raw materials and producing quality finished products					
5	Enhances goods to be delivered to its customer at the right time therefore increasing service delivery					

SECTION E: Vendor Managed Inventory (VMI) System

Please indicate your level of agreement with the following statements regarding the effects of the Vendor Managed Inventory (VMI) System on the performance of this manufacturing company using the scale provided: Strongly Disagree (1), Disagree (2), Undecided (3), Agree (4), and Strongly Agree (5).

No.	**Statements**	**1**	**2**	**3**	**4**	**5**
1	Helps in reduction of inventory levels in supply chain hence reduction of costs incurred in inventory					
2	Helps to manage and monitor the company suppliers thus improving supplier flexibility					
3	Helps to reduce re- ordering costs therefore reducing ordering costs in inventory management					
4	Enhances the scheduling of deliveries effectively and efficiently hence increasing business operations					
5	Enhances customer- supplier relationship thus increasing customer satisfaction					
6	Helps in combination of all operations in the manufacturing company from supplying of raw materials to production and delivering of goods to its customers					

SECTION F: PERFORMANCE OF MANUFACTURING COMPANIES

Do you agree with the following statements regarding performance indicators of your company, based on the following scale: Strongly Disagree (1), Disagree (2), Undecided (3), Agree (4), and Strongly Agree (5)

No.	Statements	1	2	3	4	5
1	Increases profit level through increase of sales by producing quality finished products					
2	Enhance optimal production by making sure there are enough demands for raw materials for production					
3	Increases service delivery whereby it makes sure goods are delivered to its customers at the right time and place					
4	Reduces operating costs through decrease in costs incurred in inventory					
5	Enhances flexibility of firm operations whereby the systems can change with time					

G	**Relevant Inventory cost system**					
1	There is a specific procedure of determining the cost components of total Inventory in this organization.	1	2	3	4	5
2	The purchase cost is reasonable.	1	2	3	4	5
3	Ordering or setup cost is optimal with the quantity of ordering.	1	2	3	4	5
4	Carrying costs or holding costs are optimal with the firm capacity.	1	2	3	4	5
5	Stock out cost(shortage cost)was reasonable	1	2	3	4	5
	Please write your other opinion about this area below here					
H	**Inventory cost method &Decision**					
1	Does your company apply inventory costing method	1	2	3	4	5
2	First in–First-Out(FIFO)method	1	2	3	4	5
3	Last-in-first-out(LIFO)method	1	2	3	4	5
4	Weighted average method using	1	2	3	4	5
5	Inventory decisions in this firm are solely based in predetermined market demand	1	2	3	4	5
	Please write your other opinion about this area below here					

I	**Economic order quantity (EOQ) and Reorder level**					
1	Dose the company used economic order quantity effectively	1	2	3	4	5
2	Are automatic reorder quantities used to replenish stock on the firm	1	2	3	4	5
3	In arriving at the optimum quantity to order and kept at any point in time, Management is guided by a specific scientific model	1	2	3	4	5
4	The firm operates a made-to-stock inventory system pending when demand arises	1	2	3	4	5
5	In determining optimum stock levels, management strives to maintain a balance Between minimum cost of ordering and holding stock.	1	2	3	4	5
	Please write your other opinion about this area below here					

Appendix III

Addis Ababa University of Business and Economics

Department Of Accounting and Finance

Interview Questions

1. How robust is the current inventory management system in this company?

   _____

2. What are the shortcomings of the company's inventory management system?

   _____

3. Were there professionals dedicated to inventory management within the company?

   _____

4. Which type of inventory management system did the company utilize?

   _____

5. What factors influence effective inventory management within the company?

   _____

6. Which inventory costing methods does the company employ?

   _____

7. What kind of inventory counting system does the company utilize?