A Study on The Effectiveness of Inventory Management in Cedicom Electronics, Shoranur

Mr. Harikrishnan M[1], Mr. Rajkumar Narayanan[2]
[1, 2] Dept of Management Studies
[1, 2] Jawaharlal College of Engineering and Technology, Ottapalam

Abstract- *This study focuses on the effectiveness of inventory management at CEDICOM Electronics, a mid-sized company specializing in consumer electronics and components. In the competitive electronics market, efficient inventory management is essential to balance demand variability, avoid excess inventory, prevent stockouts, and mitigate the risks of obsolescence and supply chain disruptions. The primary objective of this study is to evaluate CEDICOM's current inventory practices, assess inventory turnover rates, identify inefficiencies, and propose improvements. The study examines the company's use of technologies and methodologies for inventory tracking, emphasizing strategies such as Economic Order Quantity (EOQ) for optimizing order sizes, Just-In-Time (JIT) inventory to minimize holding costs, and ABC analysis to prioritize inventory based on importance and value. By addressing these aspects, the study aims to enhance CEDICOM's inventory management effectiveness, ultimately contributing to improved operational efficiency and competitiveness in the electronics market.*

I. INTRODUCTION

Effective inventory management is crucial in the electronics industry, where rapid technological advancements and short product cycles necessitate precise inventory control. This study examines the effectiveness of inventory management at CEDICOM Electronics, a mid-sized company specializing in consumer electronics and components. Efficient inventory management is vital to balance demand variability, avoid excess inventory, prevent stockouts, and mitigate the risks of obsolescence and supply chain disruptions. The primary objective is to evaluate CEDICOM's current inventory practices, assess inventory turnover rates, identify inefficiencies, and propose improvements. This includes analyzing the company's use of technologies and methodologies for inventory tracking, with a focus on strategies like Economic Order Quantity (EOQ) for optimizing order sizes, Just-In-Time (JIT) inventory to minimize holding costs, and ABC analysis to prioritize inventory based on importance and value. By addressing these aspects, the study aims to enhance CEDICOM's inventory management effectiveness, ultimately contributing to improved operational efficiency and competitiveness in the electronics market.

INDUSTRY PROFILE

An organization is a powerhouse of resources through which manufacturing and production operations are effectively carried out. It comes into existence when several minds are bound together through effective and efficient communication along with famous internal relations for contributing towards a common endeavor. Internship is used at creating an opportunity for the students to observe, learn, intimidate and analyze the objectives and vision of the organization and functioning of various departments.

This exercise would enable the future manager to face the challenges lying ahead. With the permission and consent from the company management and coordination from our institution, I got an opportunity to undertake an internship in CEDICOM ELECTRONICS, SHORNUR PALAKKAD. The internship was conducted for a period of 45 days, from 20 January to March 2020. CEDICOM ELECTRONICS is a company situated at Shornur Palakkad, operating in the electronic industry, offering in the production of high voltage ceramic disc capacitors, metal oxide varistors, and piezo buzzers.

Firmly grounded upon our principle of maximizing quality and reliability, Cedicom today is both a leading manufacturer and a preferred supplier to many leading blue-chip companies in India.

COMPANY PROFILE

Cedicom Electronics is an ISO 9001:2008 certified organization executing its business operation from Kerala, India. Commenced the business journey in 1996, it holds specialization in electrical products used in power, electronics, telecom, railways, power distribution, and domestic sectors. Years of experience in this domain have enabled it to become a trusted manufacturer, trader, and supplier of EHV Capacitor, High Voltage Capacitors, Hydrophone Array, Hydrophones, Metal Oxide Varistors, and Piezo Ceramic Buzzers. They are providing EHV Capacitors in various models that are integrated into medical X-ray machines, live line indication, switch gears, HV power supplies, electrical insulators, plastic

welding machines, powder coating machines, etc. Apart from civilian purposes, EHV Capacitors are also found in military applications for detecting submerged targets & submarine hunting, fisheries & echo sounding, oil explorations, sub-bottom profiling & bottom topography measurement. Grounded on the principle of reliability and quality, they are one of the most preferable companies in the electrical industry.

II. REVIEW OF LITERATURE

Dmitry Ivanov et al. (2021) - Global Supply Chain and Operations Management: A Decision-Oriented Introduction to the Creation of Value

This chapter discusses inventory management principles through a case study covering the automotive, electronics, and e-commerce sectors. It highlights the trade-off between service levels and costs, introduces ABC and XYZ analysis, and explains EOQ/EPQ models for independent demand. It also covers reorder point computation, service levels, probabilistic models, dynamic lot-sizing models, and the effects of inventory aggregation. Finally, it explains the ATP/CTP concept and performance indicators for measuring inventory management efficiency and responsiveness. An E-Supplement provides additional resources like case studies, Excel templates, tasks, and videos.

Max Muller (2019) - Essentials of Inventory Management

This resource serves as a comprehensive guide for inventory management practitioners and students, breaking down the job into fundamental concepts and steps. It covers tracking inventory costs, reading balance sheets, calculating gross profit, setting up locator systems, using bar codes and RFID, replenishment costs, disposing of dead stock, identifying system dysfunctions, and mitigating supply chain risks. It aims to provide tools to optimize efficiency and drive profits.

Donald Waters (2017) - Handbook of Logistics and Supply-Chain Management

This chapter discusses the necessity of holding stocks and the challenges of organizing them efficiently. Despite extensive research in inventory control, identifying the best policies is complex and situation-dependent. The chapter notes a trend towards lower stocks facilitated by new methods allowing goods to move quickly through the supply chain. It describes significant work in inventory control principles.

Tony Wild (2017) - Best Practice in Inventory Management 3E

This book provides a jargon-free introduction to inventory management, balancing qualitative and quantitative aspects. It outlines basic techniques, their application, and practical advice to improve customer service, cash flow, and profitability. The text emphasizes that inventory management is more nuanced than mere mathematical modeling and number crunching.

BACKGROUND

Inventory management is a critical component of the supply chain, directly impacting operational efficiency and customer satisfaction. CEDICOM Electronics, a prominent player in the electronics industry, has faced challenges in maintaining optimal inventory levels.

III. OBJECTIVES OF THE STUDY

- To assess the current inventory management practices at CEDICOM Electronics.
- To identify key challenges and inefficiencies.
- To provide recommendations for improving inventory management processes.

NEED AND SIGNIFICANCE OF STUDY

Effective inventory management is essential for CEDICOM Electronics due to the unique challenges presented by the electronics industry. The rapid pace of technological change and short product lifecycles mean that products can quickly become obsolete, leading to significant financial losses if inventory is not managed properly. Moreover, consumer demand in this sector can be highly unpredictable, requiring a nimble and responsive inventory system to prevent both overstocking and stockouts.

The need for this study stems from the critical role inventory management plays in maintaining CEDICOM's competitive edge and operational efficiency. Poor inventory management can result in excessive holding costs, increased risk of obsolescence, lost sales opportunities due to stockouts, and overall reduced profitability. By thoroughly evaluating and improving CEDICOM's inventory management practices, the company can ensure better alignment with market demands, optimized resource allocation, and enhanced customer satisfaction

STATEMENT OF PROBLEM

CEDICOM Electronics faces significant challenges in its inventory management system, which are undermining its operational efficiency and competitive edge. The current practices struggle to address the complexities of rapid technological changes, fluctuating consumer demand, and the high risk of product obsolescence. As a result, the company experiences high inventory holding costs, tying up capital and increasing storage expenses, while frequent stockouts lead to missed sales opportunities and decreased customer satisfaction.

Additionally, the rapid pace of technological advancements makes it difficult for CEDICOM to keep inventory current, resulting in significant losses from unsold outdated products.

Inefficient coordination with suppliers and distribution channels further exacerbates these issues, causing delays and increased costs. These problems underscore the urgent need for a comprehensive evaluation of CEDICOM's inventory management practices to identify root causes and propose solutions that can optimize stock levels, improve demand forecasting, and enhance overall operational efficiency. By addressing these issues, CEDICOM can better meet customer demands, reduce costs, and sustain its competitive position in the fast-paced electronics market.

IV. SCOPE OF THE STUDY

The scope of this study on the effectiveness of inventory management at CEDICOM Electronics includes an in-depth examination of several critical areas. The study also reviews inventory control processes, including procurement practices, stock level management, and warehouse operations, assessing how these practices contribute to overall inventory accuracy and efficiency. Performance metrics, such as inventory turnover rates, the frequency of stockout and overstock incidents, and carrying costs, will be analyzed to understand their impact on business operations and customer satisfaction. Additionally, the study will evaluate the demand forecasting methods employed by CEDICOM to determine their accuracy and effectiveness in predicting market demand and aligning inventory levels accordingly. By addressing these areas, the study aims to provide a comprehensive assessment of CEDICOM's inventory management practices and offer recommendations for improvement.

V. LIMITATIONS OF STUDY

- Incomplete or inaccurate data may impact conclusions.
- Current infrastructure may limit the implementation of proposed improvements.
- The focus on ABC, VED, and EOQ models might overlook other relevant strategies.
- Rapid changes in the electronics market can affect the applicability of strategies.
- External factors like supplier reliability and global supply chain disruptions can impact inventory management.

CATEGORY	ITEM	Unit Price	Quantity	Usage Value	Share of Value (%)
V	LV DISC 100KPF 50V	3	100,000 Nos	300,000	98.47
E	SOLDER STICKS 60/40	1575	1.500 KGS	2362.50	0.78
	STEEL WIRE 0.5MM	56.15	20 KGS	1123	0.37
D	ALPHA NO CLEAN FLUX	442.80	1 litre	442.80	0.15
	PRINTING INK BLUE	350	1 litre	350	0.11
	ISO PROPYL ALCOHOL	140	1litre LTRS	140	0.05
	CRAPE TAPE	41	2 Roll	82	0.03
	PAPER BASE	16	4 Nos	64	0.02
	EPOXY POWDER	15.71	3.5 KGS	54.985	0.02
	ACETONE	46.98	1 litre	46.98	0.02

VI. RESEARCH METHODOLOGY

Research Design

The study adopts a mixed-methods approach, combining quantitative and qualitative data to comprehensively assess the effectiveness of inventory management at CEDICOM Electronics. This approach allows for a thorough analysis of current inventory practices and the identification of areas for improvement.

Data collection method

- Inventory records from CEDICOM Electronics.
- Interviews with key personnel involved in inventory management.
- On-site observations of warehouse operations.

Tools and Techniques

- ABC analysis
- VED analysis
- EOQ calculation

VII. DATA ANALYSIS

Quantitative data was analysed using statistical tools to identify patterns and trends. Qualitative data was analysed thematically to gain deeper insights into operational challenges and practices.

ABC analysis

Class	Number of Items	Total Value (INR)	Total Value (%)
A	1	24,000,000	98.47%
B	3	314,264	1.29%
C	6	59,037	0.24%
	10	**24373301**	**100 %**

INTERPRETATION

- **Class A**: One high-value item accounts for 98.47% of the total inventory value, requiring stringent control and monitoring.
- **Class B**: Three moderate-value items make up 1.29% of the total value, needing regular review and balanced management.
- **Class C**: Six low-value items contribute just 0.24% of the total value, allowing for simpler, bulk ordering processes.

This distribution emphasizes prioritizing Class A items for focused management due to their significant impact on overall inventory value.

VED ANALYSIS

INTERPRETATION

- V Category: **LV DISC 100KPF 50V** is vital due to its high usage value, indicating its crucial role in the manufacturing process.
- E Category: **SOLDER STICKS 60/40** and **STEEL WIRE 0.5MM** are essential as their moderate usage values signify their importance in manufacturing, and their absence could significantly impact the production process.
- D Category: The remaining items have relatively low usage values and are categorized as desirable, meaning they are less critical but still necessary for uninterrupted production.

This VED analysis helps in prioritizing inventory management based on the criticality of each item to the manufacturing process.

EOQ CALCULATIONS

ITEM	ANNUAL DEMAND	ORDERING COST	CARRYING COST	EOQ	REORDER POINT
STEELWIRE 0.5MM	20 KGS	30,000	45,000	5.16 KGS	1.37 KGS
CRAPETAPE	2 Roll	236.25	354.375	1.63 Roll	0.14 Roll
PAPER BASE	4 Nos	112.3	168.45	2.31 Nos	0.27 Nos
ALPHA NO CLEAN FLUX	1 litre	44.28	66.42	1.15 litre	0.069 litre
ISO PROPYL ALCOHOL	1 litre	35	52.5	1.15 litre	0.069 litre
LV DISC 100KPF 50V	100,000 Nos	14	21	365.15 Nos	6,849.25 Nos
SOLDER STICKS 60/40	1.5 KGS	8.2	12.3	1.41 KGS	0.10 KGS
EPOXY POWDER	3.5 KGS	6.4	9.6	2.16 KGS	0.24 KGS
PRINTING INK BLUE	1 litre	5.4985	8.24775	1.16 litre	0.069 litre
ACETONE	1 litre	4.698	7.047	1.15 litre	0.069 litre

VIII. FINDINGS

- Inconsistent application of inventory control methods like EOQ and ABC analysis.
- Inadequate demand forecasting relying solely on historical sales data.

- Poor coordination with suppliers leading to stockouts and increased lead times.
- Suboptimal warehouse space utilization, increasing retrieval times and labor costs.

IX. SUGGESTIONS

- **Advanced Demand Forecasting**: Incorporate market trends and predictive analytics to align inventory levels with actual demand.
- **Supplier Relationships**: Strengthen supplier coordination and consider implementing Vendor-Managed Inventory (VMI) systems.
- **Warehouse Layout Optimization**: Redesign to improve space utilization and efficiency.
- **Regular Review of Inventory Control Methods**: Ensure consistent application across all product categories.
- **Staff Training**: Provide regular training on inventory management best practices and new technologies.

X. CONCLUSION

Effective inventory management is crucial for operational efficiency and competitiveness. By addressing identified inefficiencies and implementing the recommended improvements, CEDICOM Electronics can enhance inventory alignment with market demand, reduce costs, and improve customer satisfaction.

REFERENCES

[1] Global Supply Chain and Operations Management
[2] Essentials of Inventory Management
[3] Handbook of Logistics and Supply-Chain Management
[4] Best Practice in Inventory Management 3E
[5] www.cedicom.com
[6] www.wikipedia.com
[7] www.netsuite.com