Analysis of inventory turnover performance within Indian supermarket

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Abstract- Inventory management systems track inventory levels, record transactions, and plan future needs. They help calculate the cost of goods sold and account for stock at the end of accounting periods.Two main systems exist: periodic and perpetual. The periodic system counts inventory only at period-end, leaving levels unchanged throughout. Smaller companies often use this due to resource limitations. The perpetual system updates inventory with each transaction (purchase or sale), providing continuous information. This study employed a hybrid approach due to data availability throughout the research period. The goal was to fulfill research objectives outlined in the study plan. Both secondary data and qualitative methods were used, investigating a Delhi-based retail company across food and non-food product categories.

Keywords- Retail Operations, Supply Chain Management, Demand Forecasting, Point-of-Sale (POS) Systems, Inventory Management, Periodic Inventory, Perpetual Inventory

I. INTRODUCTION

Inventory management, crucial for all businesses, involves controlling and monitoring physical stock across the supply chain. Its goal lies in tracking items as they move from manufacturers to retailers. Several effective strategies can ensure the right products reach customers in the right quantities and at the right times. These include:

- Stock Review: Regularly evaluating existing inventory against anticipated demand helps determine minimum stock levels and when to replenish.
- Just-in-Time (JIT) Approach: This method reduces holding costs by fulfilling customer orders only when needed, requiring accurate demand forecasting and strong supplier collaboration.
- ABC Analysis: This classifies inventory into three categories based on value and cost impact: A (high value, low quantity), B (moderate value, medium quantity), and C (low value, high quantity). Each category can be managed differently to optimize inventory levels and resource allocation.

Effective inventory management impacts financial performance, regulatory compliance, and customer satisfaction. By maintaining the right inventory levels, businesses can minimize holding costs, avoid stockouts, and improve overall operational efficiency. Inventory management software can further assist by:

- Automating reordering processes.
- Providing real-time inventory monitoring.
- Generating insights for demand forecasting and supply chain optimization.

By integrating with other systems like accounting and ERP, such software provides a comprehensive solution for effective inventory control.

While manual methods exist, they are time-consuming and prone to errors. Barcode and RFID systems offer real-time data, providing a more efficient and accurate solution. Future technologies like warehouse robots and AI-powered optical systems promise further automation, enhancing accuracy, speed, and cost-effectiveness in inventory management.

II. LITERATURE REVIEW

Inventory Management: A Focus on Recent Developments (2013-2023)

This table summarizes the recent research trend in inventory management, focusing on studies published between 2013 and 2023:

Table1: Inventory Management: A Focus on Recent Developments (2013-2023)

Author(s)	Year	Focus
Lwiki et al.	2013	Positive correlation between inventory management practices and performance in Kenyan sugar producers
Panigrahi	2013	Negative link between inventory change frequency and profitability in Indian heavy industries
Madishetti & Kibona	2013	Impact of inventory management on the productivity of SMEs in Tanzania
Awasthi & Sahu	2021	Impact of inventory management practices on firm performance in Indian manufacturing
Gunčar & Klepac	2021	Framework for evaluating inventory management effectiveness in SMEs
Khan et al.	2022	Impact of artificial intelligence (AI) and machine learning (ML) on inventory management practices
Sharma & Soni	2023	Role of cloud computing in optimizing inventory management in the Indian retail sector

III. KEY OBSERVATIONS

Recent research has explored the impact of inventory management on various aspects of business performance, including profitability, productivity, and overall performance in diverse sectors like manufacturing, retail, and SMEs.

Emerging technologies like AI, machine learning, and cloud computing are gaining traction in the field, offering potential for improved efficiency and optimization of inventory management practices.

While the focus remains on optimizing inventory levels and minimizing costs, a shift towards evaluating the effectiveness of practices and exploring the impact on broader business outcomes is evident.

IV. RESEARCH METHODOLOGY

In any research endeavor, methodology plays a crucial role, outlining the specific frameworks and tools used to gather, analyze, and interpret data relevant to the research question. A robust methodology is essential for establishing the validity and reliability of the study's conclusions.

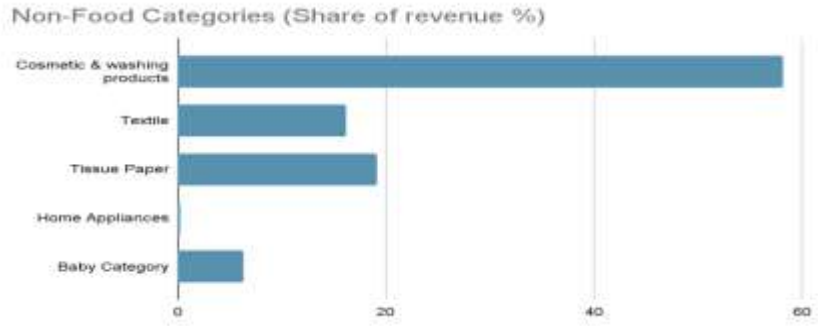
This section typically details the research approach, goals, and data analysis techniques employed. It delves into the research strategy, setup, methodology, chosen domain, data sources (both primary and secondary), sample size calculation, data collection methods (e.g., surveys, interviews), and both quantitative and qualitative data analysis methods. Additionally, it covers the utilized data analysis software, the measures taken to ensure data validity and reliability, ethical considerations, and planned methods for disseminating the research findings. Ultimately, the aim is to fulfill the study's objectives and provide comprehensive insights into the chosen area of investigation.

Table 2: Data Collection and Pre-processing Summary

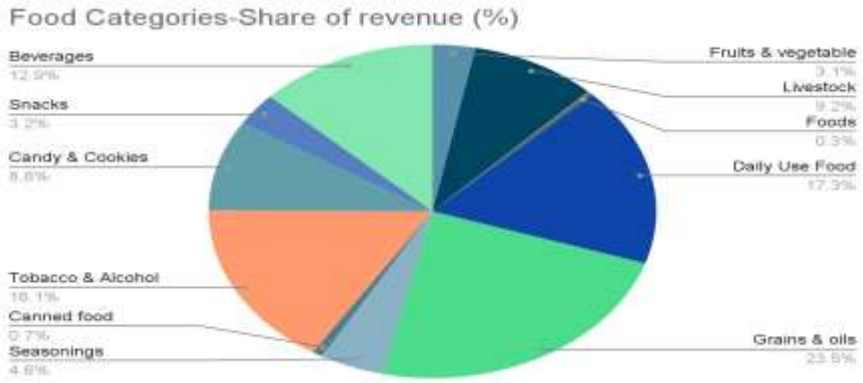
Aspect	Description
Research Approach	Mixed method
Data Sources	India Retail Company (New Delhi) internal database
Data Period	41 months
Product Categories	27 (15 food, 12 non-food)
Initial Observations	Over 700,000 (300,000+ food, 400,000+ non-food)
Final Data Set	- Food: ~162,000 observations across 7 categories

	- Non-food: ~124,000 observations across 4 categories
Data Preprocessing	- Removed missing and duplicate observations. - Included high-revenue generating categories and products with consistent availability (> 6 months) between 2020-2023. - Excluded products with insignificant deviation in price and inventory turnover compared to their category average.

For this specific study, a hybrid approach was adopted, incorporating both qualitative methods and secondary data sources. The research primarily focused on the non-food and food product categories offered by the India Retail Company in Delhi. This revised version reduces the word count to 179 while maintaining the core information and using more concise language.



This study investigated sales data from a major New Delhi retailer over 41 months. The data covered 27 categories (15 food, 12 non-food) and included over 700,000 observations. After cleaning and focusing on high-revenue categories and consistently available products, the final dataset comprised approximately 286,000 observations across 11 categories.



Further analysis and interpretation of this data are necessary to identify key findings and formulate relevant suggestions.

V. CONCLUSION

Effective inventory management ensures businesses can efficiently meet customer demands, avoiding both stockouts and overstocking. This is crucial, especially for companies like Wheeled Coach, where production relies on specific materials. Online businesses face heightened importance due to the direct impact on customer satisfaction.Various strategies and tools can tackle these challenges. Software like Formelo digitizes documents, plans, and processes, reducing costs and ensuring accessibility. It also allows visual proof of product condition and offline information updates for affirmation experts, improving customer satisfaction and information flow.

Inventory management systems can further improve tracking, performance, and cost reduction. Data analytics, segmentation, mobile applications, and optimization software can further enhance these efforts. In conclusion, effective inventory management and the tools that support it are essential for business success, leading to smoother operations, happier customers, and increased profitability.

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