

Supply Chain and Inventory Optimization for Cost Efficiency in Café Operations: A Case Study of Naivedhyam's Cafetreea

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Abstract—Purpose of the Study: The present study explores how supply chain practices and inventory handling influence cost efficiency in independent café operations, with a specific focus on Naivedhyam's Cafetreea. It looks into key operational challenges such as managing perishable stock, handling unpredictable demand, and operating without a well-defined inventory system.

Methodology:

This research is based on a case study approach, supported by direct observations and available secondary data such as purchase records and stock usage trends. Simple inventory control methods, including classification of items and reorder planning, are used to assess current practices and uncover operational gaps.

Key Findings:

The study identifies that reliance on manual and experience-based decision-making leads to issues such as overstocking, stock-outs, and wastage, particularly in perishable categories. It highlights that lack of coordination between procurement and usage significantly affects cost efficiency.

Practical and Theoretical Implications:

From a practical viewpoint, the study recommends easy-to-follow improvements such as grouping inventory based on importance, aligning orders with expected demand, and strengthening coordination with suppliers to minimize waste and ensure availability. From a theoretical perspective, the study adds value by connecting existing supply chain concepts with their practical use in small-scale café environments.

Index Terms—Supply Chain Management, Inventory Optimization, Cost Efficiency, Café Operations, Perishable Inventory, ABC Analysis

I. INTRODUCTION

1.1. Background and Context

The café industry in India has experienced rapid

growth in recent years, particularly in urban and emerging cities. Modern cafés have evolved beyond simple beverage outlets into multi-cuisine spaces offering a wide variety of food and beverage options. This expansion has increased the complexity of operations, especially in areas such as supply chain coordination and inventory management. Independent cafés, unlike large food chains, often operate with limited resources and depend heavily on manual processes, making efficient inventory control a critical factor for sustaining profitability and service quality.

1.2. Research Problem

Café operations are characterized by high menu diversity and dependence on perishable ingredients such as dairy products, fresh produce, and specialty items. These ingredients have limited shelf lives, while customer demand fluctuates based on time, season, and footfall. In the absence of a structured inventory system, cafés often face challenges such as overstocking, stock-outs, and wastage. At Naivedhyam's Cafetreea, these issues are further intensified by reliance on experience-based decision-making rather than systematic planning, leading to inefficiencies in cost management and customer service.

1.3. Motivation and Relevance

The motivation for this study arises from the need to improve cost efficiency in small café operations by addressing backend operational challenges. Inventory-related costs form a significant portion of overall expenses, and even small inefficiencies can lead to noticeable financial losses. In a competitive market, optimizing supply chain and

inventory practices is essential not only for reducing costs but also for maintaining consistent product availability and enhancing customer satisfaction.

1.4. Research Gap

A review of existing literature shows that most research on supply chain and inventory optimization focuses on large-scale food service chains or manufacturing sectors. There is limited focus on independent cafés, particularly in the Indian context, where operational constraints, supplier variability, and demand patterns differ significantly. Moreover, many studies emphasize advanced analytical models that are not easily applicable to small businesses with limited access to technology and structured data. This creates a gap in the availability of simple, practical, and implementable solutions tailored for small café operations.

1.5. Objectives of the Study

The main purpose of this study is to understand and enhance the existing supply chain and inventory management practices at Naivedhyam's Cafetreea, with the goal of improving cost efficiency while maintaining service standards. The study focuses on reviewing current operational processes, identifying gaps and inefficiencies, examining patterns of wastage, and evaluating how suppliers contribute to overall performance.

It also aims to suggest practical and workable inventory improvement methods, including stock classification and structured reordering approaches, which can be easily followed in a small café setup. In addition, the study attempts to evaluate how these improvements can influence operational efficiency and cost management.

1.6. Structure of the Paper

This study is divided into multiple sections for better clarity and flow. The literature review section discusses key concepts and earlier studies related to supply chain and inventory management. The methodology section explains how the study has been conducted, including data sources and the approach used for analysis.

Following this, the analysis and findings section presents the major observations related to operational challenges and inefficiencies. The discussion section then explains these findings in relation to existing

knowledge, leading to the final conclusions and recommendations

II. LITERATURE REVIEW

2.1. Theoretical Foundations

Supply chain management (SCM) in a café setting can be understood as the overall coordination of activities such as sourcing raw materials, purchasing, storing, and delivering them for daily operations. Instead of being just a backend function, it directly influences how efficiently a café runs and how consistently it can serve customers. In café operations, the movement of ingredients from suppliers to final usage plays a key role in maintaining both service quality and cost control. Proper coordination among suppliers, stock handling, and daily consumption helps in preventing delays and operational disruptions.

Inventory management concepts form the basis for controlling stock effectively and reducing unnecessary expenses. One commonly used approach focuses on deciding how much quantity should be ordered at a time so that both storage costs and ordering efforts remain balanced. Another approach emphasizes keeping inventory levels as low as possible by purchasing items closer to when they are actually needed, which helps in reducing excess stock.

In addition, categorizing inventory based on its importance and usage value allows better attention to be given to critical items, while less important items can be managed with simpler controls. In café operations, these methods need to be adapted carefully because of the perishable nature of many ingredients, making timely usage and proper stock rotation equally important.

2.2. Review of Key Empirical Studies

Previous studies have highlighted the importance of structured inventory systems in improving efficiency. Research by Puspitawati et al. (2024) indicates that integrating accounting systems with inventory tracking can enhance decision-making and reduce inefficiencies in small businesses, although implementation remains a challenge. Similarly, Gupta et al. (2025) examined inventory practices in quick-service restaurants and found that demand variability and perishable goods create significant operational pressure, requiring better planning and monitoring.

Olaniyi and Pugal (2024) emphasized that strategies such as lean inventory practices, improved supplier coordination, and use of basic analytics can significantly reduce supply chain costs. Their findings suggest that even simple improvements in planning can lead to noticeable gains in efficiency. In addition, studies focusing on small and medium enterprises (SMEs) in India highlight that many businesses still rely on manual processes, which limits their ability to respond effectively to changing demand conditions (Rajeev, 2010).

More recent discussions in the field also point toward the growing role of data tracking and technology in inventory management. While advanced tools can improve accuracy, their adoption in small cafés remains limited due to cost and skill constraints.

2.3. Critical Synthesis of Literature

An overall review of previous studies indicates that structured inventory practices generally help improve cost control and operational efficiency. Methods related to stock planning and prioritization have been widely used across different industries and are considered effective in managing inventory. However, many of these studies are based on environments where accurate data, technological support, and trained personnel are readily available, which is not always the case in small café operations.

It is also observed that while existing models mainly focus on optimizing costs, they often do not fully address real-world challenges faced in café settings. Issues such as fluctuating customer demand, inconsistency in supplier performance, and the perishable nature of food

items create additional complexity. Compared to manufacturing or large retail businesses, these factors have a stronger impact in cafés, making it difficult to apply standard models without adjustments.

Another key insight from the literature is the importance of simplicity and flexibility for small businesses. Instead of relying on complex systems, cafés benefit more from practical and easy-to-follow methods that can be regularly used by staff without requiring specialized knowledge or training.

2.4. Identification of Gaps

Despite the availability of extensive research on supply chain and inventory optimization, there is limited focus on independent café operations,

particularly in the Indian context. Most studies concentrate on large organizations or industries where data availability and technological infrastructure are well established.

There is also a lack of research that provides practical, easy-to-implement solutions tailored to small food service businesses. Existing models often remain theoretical and do not fully address real-world challenges such as limited resources, manual processes, and demand uncertainty.

Therefore, there is a clear need for studies that bridge the gap between theory and practice by developing simple, realistic, and scalable inventory management approaches specifically designed for independent café operations.

III. RESEARCH GAP AND CONTRIBUTION

3.1. Clear Articulation of the Gap in Existing Literature

Existing studies on supply chain and inventory management provide strong theoretical frameworks and highlight the benefits of optimization techniques such as EOQ, JIT, and ABC analysis. However, most of this research is centered on large-scale organizations or well-structured industries where data availability, technological infrastructure, and specialized expertise are already in place. As a result, the findings are often difficult to apply directly to small and independent café operations.

In the context of cafés, especially in developing markets, operations are influenced by practical constraints such as limited capital, reliance on manual processes, and inconsistent supplier performance. Additionally, the presence of highly perishable inventory and fluctuating daily demand creates a dynamic environment that is not fully addressed in traditional models. While some studies acknowledge these challenges, they do not provide clear, implementable solutions tailored to small food service businesses.

Another noticeable gap is the limited focus on the Indian café sector, where operational conditions, vendor relationships, and consumer behavior differ significantly from global markets. There is also a lack of research that connects theoretical models with simple, day-to-day practices that café staff can realistically follow without advanced technical knowledge. This highlights the need for a more

practical and context-specific approach to inventory and supply chain optimization.

3.2. Academic and Managerial Contribution of the Study

This study adds to existing knowledge by applying supply chain and inventory concepts within the context of independent café operations. It highlights the practical challenges faced by small businesses and shows how commonly used approaches can be adjusted to suit environments with limited resources and uncertain conditions. By focusing more on real-world application than purely theoretical discussion, the study connects conceptual understanding with everyday operational practices.

From a managerial point of view, the study provides practical insights that café owners and managers can use to improve their day-to-day functioning. It suggests straightforward methods such as organizing inventory based on importance, planning orders according to demand, and improving coordination with suppliers to minimize waste and manage costs effectively. The focus remains on creating systems that are simple to use, do not depend heavily on technology, and can be consistently followed by staff. Overall, the study presents a balanced view by combining conceptual knowledge with practical solutions, making it useful for both academic understanding and real-world decision-making in small café operations.

IV. CONCEPTUAL FRAMEWORK AND HYPOTHESES

4.1. Conceptual Model Description

The conceptual framework of this study is built around the idea that structured inventory and supply chain practices directly influence cost efficiency in café operations. In a setting like Naivedhyam's Cafetreea, where operations depend heavily on perishable goods and fluctuating demand, even small improvements in inventory control can create noticeable financial impact.

The model considers inventory management practices such as categorization of stock, ordering decisions, and waste monitoring as key independent factors. These practices influence the dependent outcome, which is overall cost efficiency, reflected through reduced wastage, better stock utilization, and

improved cash flow.

At the same time, certain operational elements shape how effective these practices can be. Factors such as supplier reliability, demand variability, and staff handling of inventory act as influencing conditions. For example, even a well-planned ordering system may not work effectively if supplier deliveries are inconsistent or if stock is not properly monitored at the usage level.

In simple terms, the framework suggests that better structure in managing inventory leads to better financial control, but the results also depend on how well the system is supported by daily operations.

4.2. Hypotheses Development with Justification

H1: Structured inventory categorization has a positive impact on cost efficiency in café operations.

When inventory is grouped based on importance or usage, it becomes easier to focus attention on high-value or fast-moving items. This reduces the chances of unnecessary

stocking and helps in better allocation of resources. As a result, overall inventory costs can be controlled more effectively.

H2: Effective supplier coordination improves inventory management performance. Dependable suppliers support stable inventory levels by providing timely deliveries and consistent pricing. When coordination with vendors is well maintained, cafés can limit the need for holding extra buffer stock, which helps in lowering storage-related expenses and minimizing the chances of inventory getting wasted.

H3: Monitoring and controlling wastage significantly reduces operational costs. In café operations, a large portion of losses comes from unused or expired ingredients. Regular tracking of wastage helps identify problem areas and supports better decision-making regarding purchasing and usage, ultimately improving cost efficiency.

H4: Demand-based ordering positively influences stock availability and reduces stock-outs.

Aligning inventory decisions with expected customer demand ensures that essential items are always available while avoiding overstocking. This balance helps maintain service quality and reduces lost sales due to unavailable menu items.

H5: Simpler, structured inventory practices improve overall operational performance in café small settings.

In environments where advanced technology may not be available, easy-to-follow systems are more likely to be consistently used by staff. This consistency leads to better control over inventory and smoother day-to-day operations

V. RESEARCH METHODOLOGY

5.1. Research Design

The study is based on a case study approach with a descriptive and analytical perspective. It focuses on understanding how supply chain and inventory practices function in an actual café environment and identifying areas where improvements are possible. Rather than using complex experimental methods, the approach emphasizes gaining practical insights from the day-to-day operations of Naivedhyam's Cafetreea. This helps in closely examining existing processes and suggesting solutions that are realistic and applicable in practice.

5.2. Data Sources

To develop a well-rounded understanding of the problem, both primary and secondary sources of data are considered.

Primary information is gathered through direct observation of café activities and informal interactions with staff involved in purchasing, storage, and kitchen operations. These observations provide a clearer picture of how inventory-related decisions are made in real situations.

Secondary information is obtained from available records such as purchase bills, basic stock details, and estimated sales trends. In cases where precise numerical data is not available, reasonable estimations based on observed patterns are used to support the analysis. This approach ensures that the study remains closely connected to actual operations while still allowing meaningful evaluation

5.3. Sample Design and Size

The study focuses on a selected group of inventory items rather than the entire stock. Around 20–30 key items are considered, including high-usage and high-value categories such as dairy products, fresh produce, beverages, and dry storage items. These items are chosen because they have the most direct impact on cost and wastage.

The sampling approach is purposive, meaning items

are selected based on their importance to daily operations rather than random selection. This helps in concentrating on areas where improvements can generate maximum benefit.

5.4. Measurement of Variables

The study considers both qualitative and simple quantitative indicators to evaluate performance.

- **Cost Efficiency (Dependent Variable):** Assessed through indicators such as reduction in wastage, better stock utilization, and smoother cash flow management.
- **Inventory Practices (Independent Variables):** Includes methods like stock categorization, ordering frequency, and monitoring of usage.
- **Wastage Levels:** Observed through frequency of expired or unused items.
- **Stock Availability:** Measured based on the occurrence of stock-outs for key menu items.
- **Supplier Performance:** Evaluated based on delivery consistency, pricing stability, and reliability.

These variables are measured using observation, simple comparisons, and logical assessment rather than complex statistical models.

5.5. Tools and Techniques Used for Analysis

The analysis is carried out using simple and practical methods that are suitable for small business operations

ABC Analysis: Helps in grouping inventory items according to their significance and value, making it easier to focus on the most critical items.

Basic Ratio and Percentage Analysis: Used to understand the extent of wastage and its impact on overall costs.

Comparative Analysis: Assists in identifying differences between existing practices and suggested improvements.

Trend Observation: Useful for recognizing patterns in demand and inventory usage over a period of time.

The focus is kept on simplicity and ease of use, so that the results and recommendations can be clearly understood and practically implemented by café management

VI. DATA ANALYSIS AND RESULTS

The analysis of selected inventory items reveals clear patterns in usage, cost distribution, and wastage. A small group of high-value items, such as dairy products, coffee beans, and specialty ingredients, contributes a major portion of the total inventory cost. At the same time, frequently used items like milk and bread show high turnover but relatively lower individual cost impact.

Observation of daily operations indicates that wastage is more prominent in perishable categories, particularly fresh produce and dairy products. These items are often over-purchased to avoid stock-outs, leading to unused stock at the end of the day. In contrast, dry storage items show lower wastage but sometimes contribute to hidden costs through overstocking and slow movement.

Overall, the descriptive findings highlight an imbalance between purchasing decisions and actual consumption patterns.

6.1. Reliability and Validity Analysis

As the study is primarily based on observation and practical evaluation rather than structured survey tools, formal statistical reliability testing has not been carried out. However, consistency is maintained by verifying observations with available records such as purchase bills and stock usage data.

To maintain validity, the study concentrates on key inventory categories that have a direct impact on cost and operations. Using more than one source of information, including direct observation and existing records, strengthens the trustworthiness of the findings. This

approach helps ensure that the conclusions are grounded in actual operational conditions rather than assumptions.

6.2. Inferential Statistics / Model Results

Instead of relying on complex statistical models, the study interprets observed patterns to draw meaningful conclusions. The use of ABC-based classification highlights that a relatively small group of items contributes a significant portion of the total inventory value, indicating the importance of prioritizing these items in management decisions.

Introducing structured practices such as demand-based ordering and closer monitoring of high-value

items suggests the possibility of reducing wastage and improving stock utilization. Observations also indicate that aligning purchasing decisions with actual consumption trends can improve cost efficiency.

While detailed numerical projections are limited, the overall pattern clearly supports the benefits of adopting systematic inventory control practices.

6.3. Hypotheses Testing

H1: Structured inventory categorization has a positive impact on cost efficiency in café operations. Supported. The application of ABC analysis highlights better focus on high-value items, leading to improved control over costs.

Category	Percentage of Items	Contribution to Total Cost
High-Value Items (A Category)	20–25%	65–75%
Medium & Low-Value Items (B & C)	75–80%	25–35%

H2: Effective supplier coordination improves inventory management performance. Supported. Observations indicate that consistent supplier deliveries reduce the need for excess stock and improve inventory balance.

Category	Estimated Wastage (%)	Contribution to Total Waste
Dairy & Fresh Produce	12–18%	60–65%
Other Inventory Items	5–8%	35–40%

H3: Monitoring and controlling wastage significantly reduces operational costs. Supported. Identification of wastage-prone categories helps in reducing unnecessary losses and improving cost efficiency.

Parameter	Observation
Average Stock-Out Frequency	2–4 times per week
Peak Time Occurrence	70% (Evenings/Weekends)

H4: Demand-based ordering positively influences stock availability and reduces stock-outs.

Supported. Aligning purchases with expected demand improves product availability and reduces missed sales opportunities.

H5: Simpler, structured inventory practices improve overall operational performance in small café settings.

Supported. Easy-to-follow methods are more consistently applied by staff, leading to better inventory control and smoother operations.

VII. DISCUSSION

7.1. Interpretation of Findings

The results indicate a clear pattern in café operations, where inventory-related inefficiencies are largely linked to the absence of a structured system rather than a lack of effort. Practices such as visual checking and experience-based decision-making may work adequately for regularly used items, but they become less effective when dealing with high-value or slow-moving ingredients. This imbalance creates two major issues—excess inventory that eventually turns into waste, and unexpected shortages that affect customer service.

A further insight from the analysis is the close link between purchasing decisions and wastage levels. When ordering is done without properly considering actual consumption, particularly in the case of perishable items, it leads to avoidable losses. On the other hand, even small improvements—such as aligning orders with expected demand or closely tracking important inventory items—can result in noticeable gains. This indicates that improving cost efficiency in café operations does not always depend on complex systems; consistent use of simple and structured practices can bring meaningful improvements.

7.2. Comparison with Previous Studies

The results of this study show strong similarities with earlier research that highlights the importance of structured inventory practices in improving operational efficiency. Prior studies in the food service sector have also identified demand fluctuations and the perishable nature of inventory as key challenges affecting performance. However, while much of the existing research focuses on advanced systems and technology-driven solutions, the present study indicates that even simple and

consistently applied methods can produce effective results in small café settings.

Studies related to small and medium enterprises further point out the continued reliance on manual processes and the challenges involved in adopting formal.

7.3. Theoretical Explanations

From a theoretical perspective, the findings reinforce the relevance of traditional inventory management concepts such as prioritization and demand alignment. The effectiveness of ABC categorization in identifying high-impact items supports the idea that not all inventory requires equal attention. Similarly, the benefits observed from demand-based ordering align with the core principle of minimizing excess stock while maintaining availability.

At the same time, the study highlights the need to adapt these theories to the specific context of café operations. Unlike manufacturing or large-scale retail, cafés operate in a more uncertain environment where perishability and daily demand fluctuations play a major role. This means that strict application of models may not always be practical. Instead, simplified and flexible versions of these concepts are more suitable. Overall, the discussion suggests that while existing theories remain valid, their real value lies in how effectively they are adapted to fit the operational realities of small businesses.

VIII. MANAGERIAL IMPLICATIONS

8.1. Practical Implications for Managers and Practitioners

The findings of this study offer several practical takeaways for café owners and managers aiming to improve cost efficiency without complicating their daily operations. One of the most important insights is the need to move away from completely informal inventory practices and introduce a basic level of structure. This does not require advanced software or heavy investment; even simple systems can create noticeable improvements if followed consistently.

First, managers should prioritize inventory categorization. By identifying high-value and frequently used items, attention can be directed where it matters most. This helps in reducing unnecessary spending on low-priority stock while ensuring that critical ingredients are always available.

Second, adopting a demand-aware ordering approach can significantly reduce wastage. Instead of ordering based on assumptions or visual checks alone, managers should consider past consumption patterns, day-wise demand variations, and peak business periods. Even rough tracking can help in aligning purchases more closely with actual needs.

Supplier management also plays an important role. Building stable relationships with a smaller number of reliable vendors can improve delivery consistency and reduce the need for excess safety stock. Regular communication with suppliers regarding demand expectations can further streamline the supply process.

Another key implication is the importance of waste monitoring. Tracking which items are frequently discarded can help identify problem areas in purchasing or storage. Once these patterns are understood, corrective actions can be taken, such as adjusting order quantities or improving stock rotation practices.

In addition, staff involvement is crucial. Since café operations are highly dependent on daily handling of ingredients, employees should be guided with simple and clear practices for stock usage and monitoring. Systems that are easy to understand are more likely to be followed consistently, leading to better overall control.

Finally, managers should focus on gradual improvement rather than complete system overhaul. Introducing small, practical changes step by step makes it easier to adapt and reduces resistance within the team. Over time, these incremental improvements can lead to better cost control, reduced waste, and more efficient operations.

IX. THEORETICAL IMPLICATIONS

Contribution to Theory and Literature

This study adds to existing knowledge in supply chain and inventory management by shifting the focus toward small-scale café operations, a setting that is often overlooked in academic discussions. While traditional theories provide structured models for optimizing inventory, they are usually developed in contexts where systems are stable, data is readily available, and operations are large-scale. This research highlights how those same concepts behave when placed in a more uncertain and resource-limited

environment.

One key contribution lies in demonstrating that foundational approaches such as inventory categorization and demand-based ordering remain relevant, but their effectiveness depends on how simply and flexibly they are applied. Instead of treating these models as fixed formulas, the study shows that they can be adapted into more practical versions suitable for everyday use in small businesses.

The study also brings attention to the role of operational realities, such as perishability and fluctuating demand, which are not always fully addressed in standard theoretical frameworks. By emphasizing these factors, it encourages a more context-sensitive understanding of inventory management, especially in food service environments.

In addition, the research contributes by narrowing the gap between theory and application. It highlights that the success of inventory practices is not only determined by the model itself but also by how well it fits the capabilities of the organization using it. This perspective supports the idea that simplicity, consistency, and adaptability are just as important as technical accuracy in achieving effective outcomes.

Overall, the study enriches the literature by offering a grounded view of how established supply chain principles can be interpreted and applied within the constraints of small café operations.

X. CONCLUSION

10.1. Summary of Findings

The study examines how supply chain and inventory practices affect cost management within a small café environment. The results indicate that most of the operational difficulties at Naivedhyam's Cafetreea are not caused by lack of effort, but rather by the absence of a clear and systematic way of managing inventory. Decisions are mainly based on experience and visual checks, which may be sufficient for fast-moving items but are not reliable for high-value or perishable products.

The findings further show that problems such as excess stock, shortages, and wastage are closely connected to how purchasing decisions are made. Perishable items, especially dairy products and fresh ingredients, contribute significantly to losses when

demand is not properly estimated. At the same time, the study demonstrates that simple measures like grouping inventory, ordering based on expected demand, and regularly tracking wastage can bring noticeable improvements in both cost control and stock management.

In summary, the results suggest that improving inventory management in cafés does not always require complex systems. Instead, consistent use of simple and structured practices can make a meaningful difference in overall efficiency.

10.2. Overall Contribution of the Study

This study provides a practical understanding of how supply chain and inventory concepts can be applied within a small café setting. Instead of remaining limited to theory, it shows how these ideas can be used in real operational situations through simple and workable approaches.

From a practical point of view, the study offers useful guidance for café managers to improve efficiency without depending heavily on advanced technology or large financial investments. It focuses on solutions that are easy to follow and suitable for small-scale operations.

From a research perspective, the study adds to the existing knowledge on inventory and supply chain practices in independent cafés, especially within the Indian context where such studies are limited.

Overall, the study highlights that effective inventory management is not only about controlling costs, but also about improving service quality and ensuring smoother day-to-day operations. By adopting structured yet flexible practices, small cafés can strengthen both their financial performance and operational stability.

XI. LIMITATIONS AND FUTURE RESEARCH

11.1. Study Limitations

Although this study offers useful insights into supply chain and inventory practices within a café environment, certain constraints need to be acknowledged. The analysis is based on a single case, Naivedhyam's Cafetreea, which means the findings are closely linked to its specific operating conditions. Elements such as location, customer behaviour, and supplier relationships may vary across different cafés, which can affect how widely the results can be

applied.

Another limitation arises from the dependence on observation and approximate records instead of detailed, long-term numerical data. Since a fully digital inventory system is not in place, the analysis relies on available information and practical estimation. While this approach reflects actual working conditions, it may not capture precise quantitative relationships.

Additionally, the study concentrates on a selected set of important inventory items rather than the entire range of products. This helps in maintaining practical relevance, but it also means that some smaller categories may not be fully covered in the analysis.

11.2. Directions for Future Research

Further studies can take this work ahead by including multiple café outlets instead of focusing on a single location. Studying different operational environments would make it easier to compare practices and identify patterns that are more broadly relevant across the café industry.

There is also scope to strengthen future research by using more detailed and structured data, especially through digital inventory systems. With better data availability, researchers can apply advanced analytical methods to develop more accurate and practical cost optimization approaches.

Another area worth exploring is the role of technology in improving café operations. Tools such as automated inventory tracking and demand forecasting systems can be studied to understand how they support better decision-making in small café setups.

Future work can also examine how menu planning affects inventory efficiency. Standardizing ingredients across menu items may help in reducing complexity, lowering waste, and improving stock utilization. Additionally, analyzing customer demand over longer time periods can provide deeper insights into seasonal trends and changing consumption patterns.

Overall, future research can build upon this study by combining real-world observations with improved data and wider coverage, leading to more practical and scalable solutions for café operations.

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