

# Challenges and Strategies for Inventory Management in Small and Medium-Sized Cosmetic Enterprises: A Review

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## Abstract

This article presents an in-depth analysis of inventory management challenges faced by small and medium-sized cosmetic enterprises (SMEs) and examines the strategies implemented to overcome them. Through qualitative research methods, including extensive interviews with industry managers, this study sheds light on the key obstacles encountered by SMEs in inventory management. These challenges primarily include inaccurate demand forecasting, inadequate storage facilities, and inefficient inventory control systems. To address these hurdles effectively, SMEs have implemented various strategies, such as outsourcing inventory management, embracing technology-driven inventory control systems, and establishing streamlined supply chain networks. The significance of effective inventory management for the success of SMEs in the cosmetics industry is emphasized, with the identified strategies serving as valuable insights for industry practitioners seeking to enhance their inventory management practices.

**Keywords**— Inventory management, small and medium-sized enterprises, cosmetics industry

## 1 Introduction

Inventory management assumes a paramount role in the operational framework of enterprises, particularly for small and medium-sized entities (SMEs) operating within the fiercely competitive cosmetics industry. The efficacy of inventory management stands as a pivotal factor in meeting customer demands, curtailing costs, and preserving profitability. However, SMEs in the cosmetics sector encounter a multitude of challenges when attempting to navigate the complexities inherent in inventory management. These challenges arise from the intricate nature of the industry, which mandates SMEs to grapple with an assortment of products characterized by fluctuating demand levels, abbreviated product lifecycles, and capricious customer preferences.

The principal objective of this scholarly undertaking is to discern the array of challenges confronting SMEs in the cosmetics industry as they endeavor to manage their inventories effectively. Concurrently, the study seeks to devise efficacious strategies capable of triumphing over said challenges. In pursuit of these aims, we embarked on a meticulous case study analysis, scrutinizing SMEs operating within the cosmetics industry, their inventory management practices, as well as the adversities they confront. By undertaking this inquiry, our study endeavors to augment the existing body of knowledge pertaining to inventory management within SMEs and impart practical insights tailored to the exigencies of practitioners in the cosmetics domain.

The subsequent sections of this paper are structured as follows. Initially, we offer an overarching delineation of the cosmetics industry, underscored by an exposition of the pivotal import wielded by the implementation of effective inventory management practices. Subsequently, we conducted an exhaustive review of the extant literature on inventory management within SMEs, with a particular focus on the multifarious challenges faced by SMEs entrenched in the cosmetics industry. Following this, we meticulously explicate the methodological framework employed in our research endeavor. A comprehensive analysis of our findings ensues, encompassing a

granular examination of the inventory management challenges besetting SMEs, coupled with a comprehensive appraisal of the strategies deployed to abate these impediments. Ultimately, we engage in a discerning discussion regarding the implications arising from our findings, ultimately proffering pragmatic recommendations tailored to practitioners in the cosmetics industry, thereby equipping them with the tools to ameliorate their inventory management practices.

## 2 Background of Problems

Small and medium-sized enterprises (SMEs) encounter numerous challenges throughout their developmental trajectory, often hindering their competitiveness within the marketplace [1]. Extensive research has revealed a consistent pattern of issues faced by most SMEs. Buyong et al. [2] have identified key challenges, including limited resources, inadequate management knowledge, and insufficient IT infrastructure, primarily attributed to a lack of financial support. Insufficient resources often lead to an unclear distribution of work among employees, fostering inefficiencies such as multitasking and resulting in a convoluted organizational workflow.

The absence of clear work distribution exacerbates the likelihood of crucial tasks being overlooked within the SME. It is common for employees in SMEs to shoulder multiple responsibilities due to limited financial means, which further extends to the realm of IT resources. The majority of SMEs struggle to implement sophisticated information technology innovations that could bolster productivity [3]. To ensure optimal organizational performance, seamless coordination across all components is imperative. As highlighted by Buyong et al. [2], one of the most prevalent issues faced by SMEs is inadequate inventory management. Disorganized documentation serves as the primary catalyst for poor inventory management. The dearth of employees and management expertise directly correlates with disorganized inventory records. Kryvakovska [4] emphasizes that protracted manual processing of inventory documentation engenders data inaccuracies, consequently impairing decision-making. Furthermore, Kryvakovska [4] contends that inaccurate inventory documentation significantly undermines company profits, bestowing substantial disadvantages upon the organization. As elucidated by Monnas [5], the primary objective of inventory management is to store company inventories, encompassing raw materials, work-in-progress items, and finished goods, at the lowest feasible cost. However, deficient inventory management practices compel the allocation of additional funds toward inventory, negating the intended cost reduction.

Inadequate inventory management engenders difficulties in effectively monitoring and tracking inventory, owing to flawed data records. The incapacity to accurately trace inventory adversely impacts production management and customer order fulfillment. The company may fail to recognize dwindling inventory levels, leading to potential stockouts. Ordering raw materials from suppliers necessitates time, during which inventory depletion remains uncertain. Smithers [6] further highlights the prevalence of communication breakdowns between the company and manufacturers within the supply chain. Insufficient communication further compounds the challenges faced by SMEs, manifesting in various operational disruptions with detrimental consequences for the company.

## 3 Problem Statements

The inadequate inventory management practices in small and medium-sized enterprises (SMEs) have pervasive adverse effects on company performance. X Beauty, in particular, has encountered significant challenges stemming from limited resources and subpar inventory management. These challenges have manifested in recurrent instances of stockouts, thereby disrupting operations. Smithers [6] asserts that stockouts contribute to customer dissatisfaction, eroding trust and diminishing brand loyalty. Sepehri [7] further emphasizes that deficient inventory management ultimately results in customer loss and decreased sales.

Although X Beauty has managed to mitigate the immediate consequences by requesting customers to wait for restocking, such a strategy is unsustainable in the long run. Eventually, customers become fatigued and lose interest in purchasing the products. Failing to meet market demand further compromises the company's competitiveness within the market [8].

The first predicament faced by X Beauty is the challenge of accurately tracing inventory. Reliance on conventional inventory tracking methods perpetuates a high frequency of inaccuracies, thereby disrupting sales. The lack of consistent information flow within the supply chain bears the potential for severe repercussions,

ultimately leading to financial losses [9]. Therefore, it is imperative for the company to establish robust inventory tracking systems to ensure consistency between the information gathered from various points in the supply chain and the actual inventory status within the warehouse.

The second issue pertains to inventory replenishment problems, which arise as a consequence of the aforementioned tracking deficiencies. Inadequate inventory tracking systems result in poor timing of inventory replenishment. X Beauty initiates contact with suppliers to replenish inventory when stock levels fall below 10%. However, effective coordination with both suppliers and manufacturers is paramount, as the production process requires a specific timeframe for completion. Neglecting such coordination can have severe ramifications, leading to depleted inventory levels. The empty inventory conundrum exacerbates the stockout situation, effectively halting the sales and delivery processes of the company.

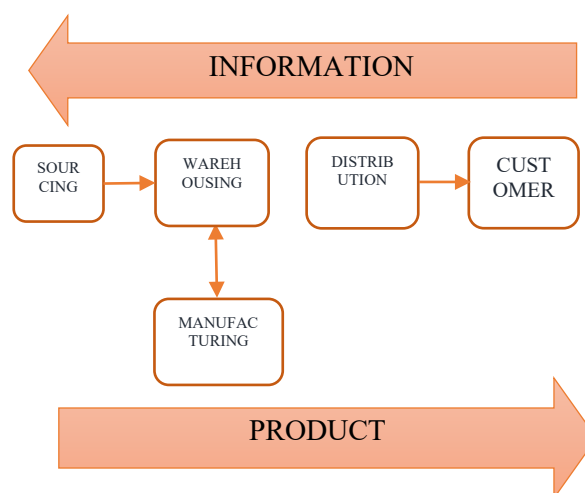
## 4 Proposed Solution

### 4.1 Supply Chain Management

Supply chain management (SCM) entails the integration of various business elements, including suppliers, warehouses, producers, and distributors, in a cohesive manner to ensure efficient flow management at the lowest possible cost [10]. The overarching objective of SCM is to reduce system costs while facilitating the production and distribution of high-quality products in the right quantities, to the appropriate locations, and at the correct times [11]. SCM primarily revolves around information utilization and employs analytical tools to enhance decision-making processes. Sorak and Dragic propose a classical model of supply chains comprising four key elements: sourcing, warehousing, manufacturing, and distribution (Figure 1). Sourcing involves the procurement of raw materials from suppliers for subsequent product manufacturing. Warehousing encompasses the storage of acquired raw materials from the sourcing phase, as well as finished goods produced during the manufacturing process. This phase facilitates inventory level tracking through the utilization of sensor technologies like tag barcodes affixed to goods, thus mitigating inventory record inaccuracies.

The manufacturing process involves the transformation of sourced raw materials into finished products, which are subsequently delivered to customers via the distribution phase. The distribution process encompasses the transfer of finished products to retailers for market entry and includes the final delivery of products to customers. SCM integrates all these elements into a cohesive cycle, fostering collaboration to yield advantageous outcomes for the organization [12]. Information derived from the supply chain serves as a foundation for strategic planning, enabling workflow enhancement and cost minimization within the organization. Such planning encompasses various facets, including inventory management, demand management, and order fulfillment.

This paper focuses on the implementation of SCM, specifically in the context of inventory management, to address the challenges faced by X Beauty. The adoption of SCM holds the potential to streamline workflow processes for SMEs, such as X Beauty, in accordance with organizational theory principles [12]. Furthermore, the implementation of SCM in SMEs can significantly enhance executive decision-making capabilities.



**Figure 1** Supply Chain elements

#### 4.2 Data Analytics

Data analytics has become a popular topic in the world nowadays. A lot of businesses have implemented data analytics in their system. There are three different types of data analytics:

1. Descriptive analytics
2. Predictive analytics
3. Prescriptive analytics

Descriptive analytics serves the purpose of understanding the current state of affairs, addressing the question of "what is happening now?" Predictive analytics, on the other hand, anticipates future events by answering the question of "what will happen in the future?" Prescriptive analytics goes a step further by offering solutions to optimize outcomes, providing answers to the question of "what should we do?" Advanced analytics methods such as big data analytics and data mining are also employed. The conventional approach of managing inventory data using spreadsheets has proven ineffective, as dealing with vast amounts of data in such a format increases the likelihood of errors [13]. Human observers struggle to identify subtle errors when handling large datasets.

Another challenge encountered by professionals when dealing with data is visualization. Executives within organizations typically prefer not to analyze data presented in spreadsheet form. Instead, they expect subordinates to present data in a more user-friendly format, enabling easier comprehension and time-saving. However, manually visualizing large datasets is a challenging task.

Given the aforementioned challenges, implementing data analytics emerges as an effective solution. Leveraging data analytics tools allows companies to transform cumbersome spreadsheets into interactive dashboards, preventing the misinterpretation of data. This approach enables executives to understand data more easily while saving time.

In the case of X Beauty, the implementation of data analytics can help address the company's challenges. Utilizing descriptive analytics for visualizing inventory levels facilitates easier inventory tracking, eliminating the need for outdated conventional methods. By creating a dashboard, the company can track inventory levels as well as sales figures.

Undoubtedly, data analytics offers numerous advantages for companies. It enables time savings by providing visual representations of data, enhancing comprehension. Executives can make better-informed decisions with a clearer understanding of the company's internal dynamics.

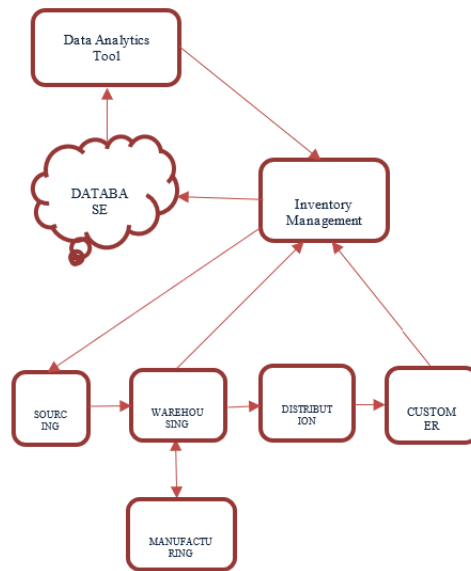
Nevertheless, there are also disadvantages associated with implementing data analytics. As an SME, the company would need to allocate resources to train employees in the use of data analytics tools, necessitating financial support. Furthermore, there is a risk of data leakage to competitors and susceptibility to cyber-attacks, highlighting security concerns.

#### 4.3 Solution Framework

This research employs a combination of supply chain management (SCM) and data analytics approaches to address the inventory management challenges faced by X Beauty. The proposed approach involves the development of an inventory management system that interfaces with the company's database server and utilizes a data analytics tool. To optimize operational costs, a cloud-based database server can be implemented. The inventory management system will oversee the monitoring of raw material stock levels for the manufacturing process, as well as the finished product inventory. Concurrently, the data analytics tool will visualize the database information and present it in the form of a dashboard within the inventory management system. Figure 2 illustrates the proposed framework.

By integrating SCM into the company's system, the four key elements of the supply chain (sourcing, warehousing, manufacturing, and distribution) will be interconnected, facilitating seamless management of the entire operational chain.

As depicted in Figure 2, the foundational components of the process remain the four elements of the supply chain. The supply chain management cycle will be linked to the inventory management system application, responsible for monitoring and tracking these activities. During the sourcing phase, each raw material stored in the warehouse will be assigned a unique tagging barcode. This barcode system enables the tracking of material movements, and any newly stored materials will be promptly updated in the inventory management system. The inventory management system, in turn, maintains a secure connection to the company's database, ensuring the safe storage of all relevant data. During the manufacturing phase, materials will be dispatched for production, and the inventory management system will update the stock of raw materials as they are utilized in the manufacturing process, automatically adjusting the inventory levels accordingly.



**Figure 2** Solution Framework

Once the manufacturing of finished products is completed, they will be returned to the warehouse for storage. During this process, the finished products will be entered into the inventory system, updating the inventory records accordingly. Subsequently, the products will be distributed to customers. The inventory management system will also track product sales, enabling the system to reserve products listed in customer orders. Upon receiving payment, the system will automatically reduce the stock levels in the inventory and initiate the delivery of the product to the customer.

To visualize the data, data analytics tools such as Microsoft Power BI or Tableau will be employed. The inventory data will be transformed into graphical representations, facilitating easier tracking of inventory stocks. The company's database will be directly connected to the data analytics tool, enabling real-time data visualization. Any changes or updates in the database will reflect immediately in the visualizations. The dashboard will display comprehensive information, including inventory stock movements, product sales, and company profits. Additionally, it can be designed to exhibit key performance indicators, such as current total sales or current inventory levels. Accessible through the inventory management application, this visualization aids viewers in comprehending the data effortlessly. Decision-makers can leverage these visualizations to enhance company planning and strategy, both in inventory management to meet customer demand, minimize the risk of stockouts, and reduce inventory costs, as well as in marketing strategy to boost sales.

Furthermore, the inventory management system will provide access to the company's suppliers. This feature allows suppliers to monitor inventory levels and receive timely alerts when the inventory level reaches a predetermined threshold, such as 20%. The system will automatically generate reordering alerts, placing orders with the suppliers and notifying the manufacturer accordingly. The number of orders can be customized by the company to align with customer demand. Consequently, efficient inventory management ensures appropriate order quantities are placed with suppliers, enabling the company to meet customer demand effectively and mitigate the occurrence of stockouts.

## 5 Challenges in The Implementation

Despite the potential effectiveness of the proposed framework in addressing the business problem faced by X Beauty, its implementation poses several challenges.

Firstly, the introduction of a new system necessitates an adaptation process within the company. The organization will need to realign its operational strategies to accommodate the new system. This adaptation will entail employee training to ensure proficiency in utilizing the new system. Additionally, it is crucial to establish effective communication channels with all suppliers to facilitate seamless access to the inventory management application and ensure its effectiveness.

Furthermore, the implementation of the new system requires financial support. The company must allocate funds to engage a software developer who will create the inventory management application and tailor it to meet the specific needs of the organization. Such an investment may entail upfront costs. However, if implemented correctly, this system has the potential to yield significant long-term benefits for the company.

## 6 Conclusion

This paper addresses the inventory management problem encountered by small and medium-sized cosmetic enterprises, with specific focus on the case of X Beauty. To resolve this issue, a hybrid approach combining supply chain management and data analytics is proposed. By employing an inventory management application, the company can effectively monitor and control its inventory.

The inventory management application serves as a centralized platform accessible to all stakeholders involved in the supply chain. Notably, it features an automated alert system that triggers notifications to suppliers when the inventory level falls below the predetermined threshold of 20%. Moreover, data analytics software is employed to visualize the inventory data in graph format, presenting it as a user-friendly dashboard. This visual representation enhances comprehension of the report and facilitates informed decision-making within the organization. Ultimately, the proposed approach has the potential to optimize workflow processes and improve overall efficiency in the company.

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