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Analysis of Raw Material Inventory Control Using The Economic Order Quantity Method at Geulis Bakery Store in Gunungsitoli City

Imelda Wulansari Saota[1], Sophia Molinda Kakisina[2], Perlindungan Faebuadodo Hulu[3], Idarni Harefa[4].

[1,2,3,4,] Management, Faculty of Economic, Nias University, Indonesia

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ABSTRACT

The study investigates the application of the Economic Order Quantity (EOQ) method in managing raw material inventory at Geulis Bakery Store in Gunungsitoli City. Utilizing a quantitative descriptive approach, the study aims to provide insights into inventory management practices, particularly focusing on the EOQ method's effectiveness. Data were collected through interviews, observation, and document analysis, with the research population consisting of raw material inventories at the bakery. Findings revealed that the EOQ method led to smaller but more cost-effective raw material orders compared to the previous ordering policy. Moreover, the EOQ method enabled the optimization of safety stock levels, reducing the risk of stockouts while minimizing inventory holding costs. The study highlights the enhanced efficiency achieved in inventory control through the EOQ method, emphasizing its potential to streamline operations and improve financial performance for small-scale enterprises like Geulis Bakery Store. Future research could explore the EOQ method's applicability in different industry contexts and evaluate its comparative effectiveness against other inventory management techniques. Overall, the study underscores the significance of adopting efficient inventory control strategies to enhance business competitiveness and sustainability in today's dynamic market environment.

Corresponding Author:

Imelda Wulansari Saota
Faculty of Economic,
Nias University, Indonesia
Gunungsitoli city, North Sumatra, Indonesia.
Email: imelsaota2018@gmail.com

1. INTRODUCTION

The evolution of business in society has seen significant growth, driven by technological advancements. Among these businesses are those in the industrial sector, ranging from large corporations to medium-sized enterprises and small-scale businesses. This growth has intensified competition among companies. With increased competition, there is a pressing need for every company to enhance efficiency across all aspects of operations (Sa'adah et al., 2021).

Efficient production processes are essential for effective and efficient operations, making supervision and control critical. The quantity and management of inventory are crucial because inventory levels can significantly affect a company's production flow. The required inventory levels vary among different companies depending on production volume, type, and process. Inventory is

an integral part of any business. According to (Marc Lim, 2023) inventory refers to the process of storing raw materials or goods to fulfill specific purposes.

Raw materials are the components that form the entirety of the finished product. These materials undergo production processes, transformed into finished goods using direct labor and factory overheads (Kocaman et al., 2023). The continuity of production processes in a company is influenced by various factors, one of which is the inventory of raw materials. Therefore, every company must plan its raw material requirements.

If a company purchases too many raw materials, it will have excessive investments in both purchasing and storing them. Conversely, purchasing too few raw materials can reduce profits due to stockouts, where the company runs out of materials, resulting in lost sales opportunities and additional costs from rush orders (Kaiser et al., 2023).

Every company must determine the necessary raw materials to produce a certain quantity of finished goods within a specified period. This is crucial to prevent shortages that could halt production processes. One method used for economically planning raw material orders is the Economic Order Quantity (EOQ) method. EOQ aims to determine the optimal order quantity to minimize costs while meeting demand (Cesariana et al., 2022).

The EOQ method calculates the most economical purchase volume for each order. It aims to minimize inventory levels, reduce costs, and improve quality. "The Economic Order Quantity method is a mathematical model that determines the quantity of goods to be ordered to meet projected demand, while minimizing inventory costs. This method is relatively easier to apply compared to other methods or systems" (Sharp et al., 2024). To meet these needs efficiently, particularly in terms of cost-effectiveness, various benefits can be obtained by purchasing at minimal costs. By employing the Economic Order Quantity strategy, companies can ensure optimal safety stock and reorder points to avoid inventory shortages and excess.

Geulis Bakery Store, located in Gunungstoli City at Jalan Diponegoro No.70 Simpang Meriam, is one such industrial business specializing in bread production. The bakery relies on essential raw materials such as flour, butter, and sugar. Based on the tables above, it can be observed that Geulis Bakery Store's raw material orders fluctuate each month, sometimes exceeding usage and sometimes falling short. This irregular ordering is due to the company's inventory planning based on previous periods' purchases and usage, leading to overstock situations. The company has also not established reorder points and safety stock levels in inventory control. Continual overordering will result in wasteful inventory costs, as the company purchases large quantities of raw materials, accompanied by increased ordering and storage costs. Based on the above phenomenon, the author is motivated to conduct a study titled "Analysis of Raw Material Inventory Control Using the Economic Order Quantity Method at Geulis Bakery Store in Gunungstoli City."

2. RESEARCH METHOD

The research method employed in this study utilized a quantitative descriptive approach, aiming to describe, examine, and explain the observed phenomena using numerical data (Sharp et al., 2024). This approach facilitated a comprehensive understanding of the research problem by collecting, preparing, and analyzing data, resulting in a clear depiction of the issue under investigation. Specifically, this study focused on quantitatively measuring the optimal inventory level of raw materials using the Economic Order Quantity (EOQ) method at Geulis Bakery Store in Gunungsitoli City.

Moreover, the research type was qualitative, aiming to provide a comprehensive portrayal of a phenomenon or situation, including its characteristics, relationships, and patterns (Cay & Irnawati, 2020). By combining quantitative and qualitative approaches, this study aimed to gain deeper insights into the integrated management quality at Toko Wery Bakery in Gunungsitoli City.

The research location was Geulis Bakery Store, situated at Jalan Diponegoro No.70 Simpang Meriam, Kelurahan Ilir, Kecamatan Gunungsitoli, Provinsi Sumatra Utara. The research schedule was outlined from March 2023 to August 2023, encompassing various research activities such as proposal submission, proposal seminar, data collection, data analysis, and manuscript preparation.

Data for this study were obtained from two primary sources: primary and secondary data. Primary data were collected through interviews conducted with owners, employees, and customers of Geulis Bakery Store, while secondary data were gathered from existing sources such as previous research, books, journals, and relevant documents (Siswantoro, 2023).

Data collection methods included interviews, observation, and document analysis. Interviews were conducted using a structured questionnaire to obtain information directly from the research subjects. Observation involved visiting Geulis Bakery Store to confirm inventory, ordering, and storage-related data. Document analysis focused on historical data from the bakery and inventory-related information (Xu & Smyth, 2023).

The research population consisted of raw material inventories at Geulis Bakery Store, while the sample comprised specific inventory data from the store. The sampling technique involved selecting a subset of the population that represented its characteristics.

Data analysis primarily utilized the Economic Order Quantity (EOQ) method to determine the optimal order quantity, safety stock, reorder point, and total inventory costs. EOQ calculations involved parameters such as ordering costs, demand, and holding costs per unit per year. Additionally, safety stock and reorder point calculations factored in lead time and demand variability. Overall, the analysis aimed to optimize inventory management practices at Geulis Bakery Store (Buzzacchi et al., 2023).

3. RESULTS AND DISCUSSIONS

The study delved into the effectiveness of the Economic Order Quantity (EOQ) method in managing raw material inventory at Roti Geulis Shop in Gunungsitoli City. The findings revealed that the implementation of the EOQ method led to significant improvements in inventory management practices. Specifically, the EOQ method resulted in smaller orders of raw materials compared to the shop's previous ordering policy. Despite the reduction in order quantities, the total inventory costs incurred by the shop decreased, indicating the cost-saving potential of the EOQ method (Sadrakh Zefanya Putra et al., 2023).

Moreover, the study demonstrated that the EOQ method enabled the optimization of safety stock levels at Roti Geulis Shop. Safety stock plays a critical role in ensuring uninterrupted production processes and meeting customer demand, especially in uncertain market conditions. By accurately determining safety stock levels based on demand variability and lead times, the shop can minimize the risk of stockouts while avoiding excessive inventory holding costs (Cay & Irnawati, 2020).

Furthermore, the findings underscored the enhanced efficiency achieved in raw material inventory control through the EOQ method. By optimizing order quantities and inventory levels, the shop can better align its inventory management practices with actual demand fluctuations. This not only reduces costs associated with excess inventory but also ensures that the shop can fulfill customer orders promptly, thereby enhancing customer satisfaction and loyalty (Fedorenko et al., 2023).

The implications of the study extend beyond inventory management practices to broader business operations. For small-scale enterprises like Roti Geulis Shop, efficient inventory control is crucial for maintaining competitiveness and sustaining profitability. By adopting the EOQ method or similar inventory management techniques, businesses can streamline their operations, reduce costs, and improve overall financial performance (Siswantoro, 2023).

Moreover, the study highlights the importance of sound inventory control practices in navigating the dynamic and competitive business landscape. In today's market environment, where uncertainties abound and customer expectations continue to evolve, businesses must leverage effective inventory management strategies to remain agile and responsive to changing market demands (Scholdra et al., 2023).

Looking ahead, future research could explore the applicability of the EOQ method in different industry contexts or evaluate its comparative effectiveness against other inventory management techniques. Additionally, investigating the integration of technology-driven solutions, such as inventory management software, could provide further insights into optimizing inventory control practices for enhanced business performance.

In conclusion, the findings of this study underscore the significance of adopting efficient inventory control strategies, such as the EOQ method, for improving business performance and competitiveness. By optimizing raw material inventory management practices, businesses can reduce costs, enhance operational efficiency, and position themselves for sustainable growth in today's competitive market environment.

4. CONCLUSION

Based on the research conducted by the researcher entitled "Analysis of Raw Material Inventory Control Using Economic Order Quantity (EOQ) Method at Roti Geulis Shop in Gunungsitoli City", several conclusions can be drawn as follows: The results of this study show that ordering raw materials such as flour, butter, and sugar according to the Economic Order Quantity (EOQ) method are smaller than the policy implemented by Roti Geulis Shop. However, with the EOQ method, the total inventory cost incurred is reduced. Thus, this study also proves several theories that the EOQ method can reduce costs incurred by the company. One of them is Rangkuti's theory (2004:136), which states that the Economical Order Quantity (EOQ) method is the ordering level that minimizes total inventory costs. Therefore, it can be concluded that the EOQ method is very effective for companies in controlling raw material inventory, especially for cost savings. The implementation of raw material inventory with the Economic Order Quantity method can determine several amounts of safety stock that must be prepared by Roti Geulis Shop. This is aimed at avoiding problems that can hinder the production process, which affects the profit obtained by Roti Geulis Shop in Gunungsitoli City. From the above analysis, the researcher can draw a conclusion that controlling raw materials at Roti Geulis Shop is more effective and efficient using the Economic Order Quantity method. The application of the Economic Order Quantity method in inventory control can optimize raw material purchases and determine optimal raw material orders, so that raw materials are obtained at minimum cost.

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