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OPTIMIZING INVENTORY IN THE RECEIVING & STOREKEEPER DEPARTMENT OF A HOTEL USING THE MIN-MAX METHOD

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Abstract

Inventory management plays a crucial role in hotel operations due to its direct impact on service continuity and cost control. Improper inventory management may result in excessive storage costs or operational disruptions caused by stock shortages. This study aims to analyze inventory optimization in the Receiving & Storekeeper department of a hotel using the Min–Max method. The research adopts a quantitative approach utilizing secondary data in the form of hotel inventory records. The analysis involves the calculation of safety stock, minimum stock, maximum stock, as well as inventory costs, including holding cost and ordering cost, accompanied by an inventory optimization index assessment. The results indicate that all analyzed inventory items are in optimal condition, as the actual stock levels remain within the established minimum and maximum limits. Furthermore, the total ordering cost exceeds the holding cost, reflecting a procurement pattern characterized by frequent orders with relatively small order quantities. These findings demonstrate that the Min–Max method is effective in maintaining inventory availability while controlling inventory-related costs, and can support more measured decision-making in hotel inventory management.

Keywords: Inventory Management, Min–Max Method, Holding Cost, Ordering Cost, Hotel

INTRODUCTION

Loman Park Hotel Yogyakarta, formerly known as Prime Plaza Hotel, is located on Jl. Affandi, Sleman, D.I. Yogyakarta, and has contributed to the development of Indonesian tourism since the Visit Indonesia Year 1992 program when it operated under the Radisson brand, giving it over 30 years of operational experience. Currently managed by ATAP Hospitality under PT Anindya Mitra Internasional and PT Jogja Wisata Istimewa, the hotel has been officially operating as Loman Park Hotel Yogyakarta since October 28, 2023. The hotel emphasizes heartfelt service based on Javanese local wisdom, reflected in its classic-modern Javanese room designs, meeting facilities including Lulio Ballroom and Executive Meeting Rooms, culinary services at Pawon Indigo Restaurant and Infuse Imuno Bar, and wellness and recreational facilities through Hula Hoop Wellness and Recreation, offering fitness, health, and family recreation services. The hotel employs approximately 140 staff across key departments such as Human Capital, Accounting, Housekeeping, Sales & Marketing, Engineering, Front Office, Food & Beverage, and Wellness, supported by strategic partnerships for human resource development in tourism (IDEA, 2025).

Effective inventory management is critical in hospitality operations, particularly in the Receiving & Storekeeper department, which handles planning, procurement, storage, and distribution of goods essential for daily hotel operations (Krajewski & Malhotra, 2021). Receiving staff ensure that the quantity and quality of goods match orders, while storekeepers manage storage, documentation, and timely distribution, directly affecting service continuity and guest experience. However, hotels often face discrepancies between actual stock and operational needs, leading to overstock or stockout conditions, both of which increase costs or disrupt service (Heizer et al., 2015). Therefore, inventory must be managed based on accurate data to maintain an optimal balance between availability and cost efficiency, supporting business sustainability and competitiveness (Stevenson, 2018).

All ordering and storage decisions should consider actual demand and lead time to ensure smooth operations, consistent service quality, and minimized hidden costs such as holding cost, insurance, damage risk, and opportunity cost. The Min–Max method is an effective approach for maintaining stock balance, setting minimum levels as reorder points and maximum levels to prevent overstock (Nahmias & Olsen, 2015). By applying these limits, hotels can ensure optimal inventory availability while reducing waste. The Min–Max method not only improves operational efficiency but also contributes to cost savings by controlling ordering and storage activities (Ramadhan & Saifuddin, 2024). Furthermore, research highlights that Min–Max inventory management can reduce holding costs, improve cash flow, and enhance customer service (The Benefits of Min/Max Inventory Management in GOIS, 2024).

Based on this context, this study aims to optimize inventory management in the Receiving & Storekeeper department of the hotel using the Min–Max method, minimizing risks of overstock or stockout while optimizing associated ordering and storage costs. The research is titled **"Inventory Optimization in the Receiving & Storekeeper Department of a Hotel Using the Min–Max Method**".

REVIEW OF LITERATURE

Inventory Management

Inventory management is the process of planning, organizing, and controlling all activities related to inventory, from ordering and storage to usage, with the aim of minimizing total costs while ensuring the availability of items required for operations (Heizer et al., 2015). Inventory includes raw materials, work-in-progress, and finished goods stored to meet future consumer demand or production needs. Effective management prevents overstock and stockout, maintaining production stability and service continuity (Stevenson, 2018). In the hospitality industry, effective inventory management is critical as it directly impacts service quality and guest satisfaction; the unavailability of items, whether room facilities or operational supplies, can disrupt logistics and negatively affect the guest experience and hotel reputation.

Receiving

Receiving is the initial stage of inventory management responsible for verifying that delivered items match purchase orders, including quantity, quality, and completeness of documents such as purchase orders and delivery notes. The main goal is to ensure items meet specifications and arrive on time to avoid operational disruptions. In hotels, the receiving department ensures that food, beverages, and operational equipment are delivered in proper condition and according to the needs of each department. Poor management at this stage can lead to stock errors, waste, or delays in inter-department distribution (Heizer et al., 2015).

Storekeeping

Storekeeping involves managing received items by storing, safeguarding, and issuing them according to operational needs. Its goal is to prevent stockouts or overstock conditions. Bowersox (2014) emphasizes that storage is a crucial component of the logistics system, balancing cost efficiency with desired service levels. In hotels, storekeeping staff are responsible for regular stock recording and ensuring that warehouse conditions meet safety and cleanliness standards. The performance of this division directly affects the accuracy of stock data used in control methods such as Min–Max.

Inventory Control

Inventory control involves planning and monitoring item quantities to achieve optimal stock levels. According to Heizer et al. (2015), the main objective is to determine the right quantity and timing for purchasing items to reduce total costs, including ordering, holding, and shortage costs. In practice, inventory control can be applied using methods such as reorder points or the Min–Max system. The Min–Max system sets minimum and maximum stock levels as guidelines for when items should be reordered, ensuring that inventory availability is maintained at an optimal level (Bowersox, 2014).

Min–Max System

The Min–Max system is a simple inventory control method widely used across various industrial sectors, including hotel operations, as it can maintain stable stock availability without intensive monitoring. This system uses two main parameters: the minimum stock level and the maximum stock. When inventory reaches the minimum threshold, the company will reorder to restore stock to the maximum level. This method is effective in preventing stockouts, reducing emergency ordering costs, and optimizing storage capacity by setting stock parameters adaptively based on historical data, seasonal trends, and

procurement policies (Silver et al., 2017). In practice, the calculation of the minimum stock or reorder point (ROP) considers average demand, lead time, and safety stock, while the maximum stock is determined by adding the economic order quantity to the ROP. This ensures that hotel operations, such as the provision of food, beverages, and daily supplies, run smoothly without disruption.

Inventory Costs

Inventory is a crucial element in company operations because it directly affects production continuity and customer service. However, its management incurs various costs (Heizer et al., 2015). Inventory costs can be divided into three main categories: ordering costs, which include all expenses incurred each time an order is placed, such as administration, shipping, communication, and receipt; holding or carrying costs, which arise from storing goods in a warehouse, including logistics, insurance, maintenance, security, depreciation, and capital costs; and setup costs, which occur when preparing production or raw material/product orders. Effective inventory cost management can reduce operational expenses, improve supply chain efficiency, and strengthen the company's competitiveness. Therefore, every stage of inventory control, from ordering to storage, must be carried out in a measured and optimal manner.

Safety Stock

Safety stock is an additional reserve prepared to address uncertainties in demand or lead time, functioning as a buffer to ensure smooth operations even if there are fluctuations in demand or delays in delivery (Heizer et al., 2015). In a hotel environment, safety stock is especially important for high-demand or long-lead-time items, such as beverages and daily-use cleaning supplies, so that reserve stock can maintain operational continuity. Therefore, calculating safety stock is a crucial component of the Min–Max system, as it determines the minimum stock level required to guarantee uninterrupted operations.

Optimization Theory

Optimization theory explains the process of finding the best value of an objective function while considering various logistical constraints. According to Silver et al. (2017), in inventory management, inventory optimization aims to balance ordering and holding costs so that total inventory costs can be minimized without reducing stock availability. In this study, optimization is conducted by evaluating whether stock availability has reached an ideal condition, meaning neither overstock nor stockout occurs. Through Min–Max analysis, holding costs, ordering costs, and stock optimization indices can be measured quantitatively. Therefore, optimization theory also serves as a foundation to assess the effectiveness of Min–Max implementation in improving warehouse inventory efficiency in hotels.

Decision Making

Robbins (2018) states that the decision-making process involves selecting the best option based on available information. In the context of inventory systems, decisions regarding the timing and quantity of orders are examples of logical decision-making. By applying the Min–Max method, the decision-making process relies not only on estimates but also on concrete data such as current stock, average prices, and purchase frequency. This results in data-driven decision-making.

RESEARCH METHOD

This study employs a quantitative approach to analyze the condition of hotel warehouse inventory based on inventory management parameters, such as stockout risk and overstock control, using numerical data from the hotel's inventory system (Creswell & Creswell, 2017). The unit of analysis consists of inventory items that are consistently available, have complete data, and impact hotel operations. Data were obtained secondarily through documentation, including purchase reports and inventory records, due to their completeness, standardization, and efficiency in terms of time and cost (Sekaran & Bougie, 2016). The analysis was conducted to assess whether actual stock levels were optimal using the Min–Max method, calculating safety stock, minimum stock, and maximum stock, as well as evaluating inventory costs through holding costs and ordering costs, and using a stock optimization index to assess the balance between product availability and cost control.

This study has certain limitations, including the estimation of inventory costs based on field data, the absence of ABC analysis due to the focus on daily stock optimization, and the use of short-term data that does not reflect long-term demand fluctuations. Nevertheless, the Min–Max approach with practical and adaptive parameters provides a clear picture of the effectiveness of daily stock management, which is easily applicable in hotel operations, in line with the principles of effective and efficient inventory management (Heizer & Render, 2017).

RESULTS AND DISCUSSION

Research Data Description

The research data were obtained from the Receiving & Storekeeper department of the hotel, which is responsible for the receipt, quality and quantity inspection, and storage of goods in the hotel warehouse. Secondary data in the form of inventory records were used, including current stock, average price, and last price of each item. The data collection focused on items directly managed by the Receiving & Storekeeper department and routinely used by various departments, such as housekeeping, front office, and food and beverage, as they play a crucial role in the smoothness of daily operations and the quality of guest services.

In this study, 15 items were selected for analysis using the Min–Max method based on usage frequency, availability of consistent stock data, role in hotel operations, and relevance to warehouse capacity and space limitations. Therefore, the results of the analysis are expected to reflect optimal and practical inventory management for hotel stock control (Heizer & Render, 2017).

Table 1.
List of Inventory Items and Reasons for Their Selection

No	Item	Category	Reason for Selection
1	Nescafe stick	Food & Beverage	Used both in guest rooms and F&B outlets, with daily usage frequency and economic value that need to be controlled.
2	Cleo bottle 330ml	Food & Beverage	Used as drinking water for guests and hotel operational activities, with a relatively large storage volume.
3	Creamer sachet	Food & Beverage	Beverage supporting item with high dependency on guest activities, requiring analysis of adequate stock levels.

4	White sugar sachet	Food & Beverage	A primary requirement for guest beverages and F&B operations.
5	Palm sugar sachet	Food & Beverage	Used as a supporting ingredient for beverages in rooms and outlets.
6	Brown sugar sachet	Food & Beverage	Used as a supporting ingredient for beverages in rooms.
7	Dried Butterfly Pea Flower 250g	Food & Beverage	F&B ingredient with non-daily but recurring usage, relatively long shelf life, and risk of quality decline if overstocked.
8	Facial tissue napkin	Amenities	Routinely used in public areas and guest rooms, requiring stable stock availability.
9	Dinner tissue napkin	Amenities	F&B essential with consistent daily usage.
10	Toothbrush	Amenities	Mandatory in guest rooms, directly affecting guest satisfaction.
11	Slipper	Amenities	Must always be available in every room to support hotel service standards.
12	Logo pencil	Stationery	Used as room equipment and for administrative needs, often part of the hotel's brand identity.
13	Logo ballpoint pen	Stationery	Used as room equipment and for administrative needs, also part of the hotel's brand identity.
14	Shower cap	Amenities	Guest room item with relatively high usage.
15	Cotton bud	Amenities	Bathroom essential with small size but high quantity usage.

Overall, these 15 items were selected because they represent the characteristics of inventory in the hotel warehouse, both in terms of the variety of items, economic value, frequency of use, and storage space requirements. By analyzing these items, this study is expected to provide a comprehensive picture of the condition and effectiveness of inventory management in the Hotel Receiving & Storekeeping department.

Data analysis

The data analysis in this study was conducted to assess the condition and adequacy of hotel warehouse inventory using the Min–Max method, focusing on determining safety stock, minimum stock, maximum stock, and evaluating inventory costs, including holding and ordering costs. Additionally, a stock optimization index was applied to identify whether actual stock levels were optimal, overstocked, or at risk of stockout, aiming to provide recommendations for improving hotel inventory management policies. The analysis was based on current stock and available price information, and due to limitations in daily usage data and undocumented lead times, realistic assumptions were applied to estimate the necessary values in line with hotel operational conditions, as described in Chapter III (Creswell & Creswell, 2017; Heizer & Render, 2017). This approach ensures the analysis remains feasible and relevant, producing valuable insights despite data constraints within the hotel operational context.

Analysis of Safety, Minimum, and Maximum Stock Calculations

The inventory level analysis in the hotel warehouse was conducted by calculating safety stock, minimum stock (reorder point), and maximum stock as the main parameters of the Min–Max method. These parameters were used to evaluate the adequacy of warehouse inventory and address the first research question regarding stock conditions and sufficiency. By calculating these three indicators, the study aims to assess whether the available inventory

can support smooth hotel operations while remaining within reasonable control limits (Heizer & Render, 2017).

Safety stock analysis

Safety stock analysis was conducted to determine the inventory buffer needed to anticipate demand uncertainty and potential delays in deliveries to the hotel warehouse. In this study, safety stock was calculated as 30% of the current stock using the formula: Safety stock = current stock × 0.3**.** The 30% rate was chosen to adjust for the hotel's operational conditions, where usage is relatively stable but may increase during peak periods, such as high occupancy, while also considering that most items are amenities (Heizer & Render, 2017).

Table 2.
Safety Stock 15 Item

No	Item	Current Stock	Safety Stock
1.	tissue facial napkin	60	18
2.	tissue dinner napkin	144	43.2
3.	Slipper hotel	2,000	600
4.	pensil logo	1,200	360
5.	shower cap	1,500	450
6.	cotton bud	1,300	390
7.	tooth brush	2,400	720
8.	ballpoint hotel	4,328	1298.4
9.	nescafe stick	1,120	336
10.	brown sugar sachet	5,500	1650
11.	palm sugar sachet	300	90
12.	white sugar sachet	7,500	2250
13.	creamer sachet	2,500	750
14.	Cleo bottle 330 ml	72	21.6
15.	Dried Butterfly Flowers 250gr	10	3

The calculation results indicate that safety stock values vary across items. High-consumption items, such as white sugar sachets, brown sugar sachets, and hotel ballpoint pens, have the highest safety stock, reflecting a relatively high risk of delays and the need for larger reserves. In contrast, items with specific or non-daily usage patterns, such as dried butterfly pea flowers, have the lowest safety stock, indicating lower dependency and minimal required reserves (Heizer & Render, 2017).

Minimum Stock Analysis (Reorder Point)

Minimum stock is set as the lowest inventory level that triggers a reorder, enabling the hotel to prevent stockouts during operations. It is calculated using the formula: MIN Stock = safety stock + (current stock × 0.2), where the additional 20% of current stock serves as a buffer for lead time, assuming that the procurement process may require a certain period and could experience delays (Heizer & Render, 2017).

Table 3.
Minimum Stock 15 Item

No	Item	Safety Stock	Minimum Stock
1.	tissue facial napkin	18	30
2.	tissue dinner napkin	43.2	72
3.	slipper hotel	600	1,000

4.	pensil logo	360	600
5.	shower cap	450	750
6.	cotton bud	390	650
7.	tooth brush	720	1,200
8.	ballpoint hotel	1298.4	2,164
9.	nescafe stick	336	560
10.	brown sugar sachet	1,650	2,750
11.	palm sugar sachet	90	150
12.	white sugar sachet	2,250	3,750
13.	creamer sachet	750	1,250
14.	Cleo bottle 330 ml	21.6	36
15.	Dried Butterfly Flowers 250gr	3	5

The results indicate that items with high safety stock also have relatively higher minimum stock levels, suggesting that reordering for these items should be done earlier to maintain availability. Daily consumables such as white sugar sachets, brown sugar sachets, and hotel ballpoint pens are prioritized in minimum stock control due to their direct impact on guest service, while items with lower minimum stock levels allow greater ordering flexibility as they are not used intensively. Thus, the determination of minimum stock in this study considers the differing usage characteristics of each item (Heizer & Render, 2017).

Maximum Stock Analysis

Maximum stock is set to establish the highest acceptable inventory level in the hotel warehouse, aiming to prevent overstock and reduce storage cost wastage. In this study, maximum stock is calculated using the formula: MAX Stock = 2 × MIN Stock. Setting the maximum stock at twice the minimum stock serves as a practical approach to balance product availability and warehouse capacity. This method is commonly used when detailed historical demand data are unavailable, while systematic stock control remains necessary (Heizer & Render, 2017).

Table 4.
Maximum Stock 15 Item

No	Item	Minimum Stock	Maximal Stock
1.	tissue facial napkin	30	60
2.	tissue dinner napkin	72	144
3.	slipper hotel	1,000	2,000
4.	pensil logo	600	1,200
5.	shower cap	750	1,500
6.	cotton bud	650	1,300
7.	tooth brush	1,200	2,400
8.	ballpoint hotel	2,164	4,328
9.	nescafe stick	560	1,120
10.	brown sugar sachet	2,750	5,500
11.	palm sugar sachet	150	300
12.	white sugar sachet	3,750	7,500
13.	creamer sachet	1,250	2,500
14.	Cleo bottle 330 ml	36	72
15.	Dried Butterfly Flowers 250gr	5	10

The calculation results indicate that the maximum stock values for most items are relatively equal to the current stock, suggesting that the procurement and storage policies implemented by the Receiving & Storekeeper department have been effectively controlled. Current stock does not exceed the established maximum limits, thus avoiding indications of overstock. To provide a comprehensive overview of the distribution of safety stock, minimum stock, and maximum stock across all inventory items, the results are presented in a graph comparing the safety, minimum, and maximum stock levels of the 15 analyzed hotel warehouse items (Heizer & Render, 2017).

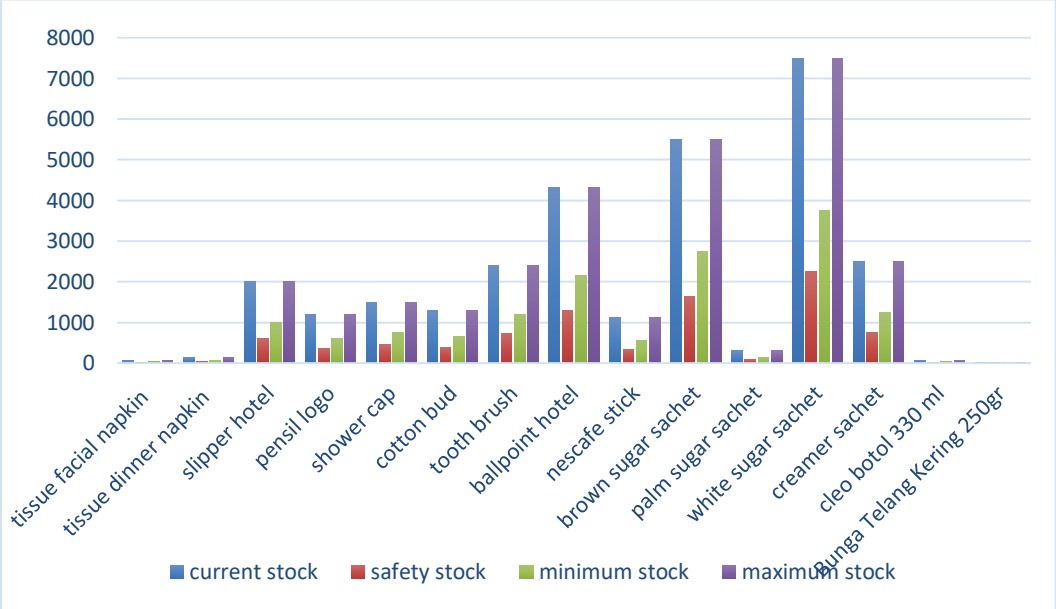

Figure 1.
Comparison Chart of Safety, Minimum, and Maximum Stock
Source: Data processed by researchers (2025)

Based on the graph, the minimum stock consistently remains above the safety stock, while the maximum stock is higher than the minimum stock for all items. Overall, calculations indicate that certain inventory items namely white sugar sachets, brown sugar sachets, and hotel ballpoint pens have relatively higher safety stock, minimum stock, and maximum stock levels. The elevated safety stock of these items reflects high usage frequency, routine consumption, and their direct role in supporting hotel operations and services (Heizer & Render, 2017). White and brown sugar sachets are widely used across various F&B outlets and room services, resulting in stable and relatively high consumption that necessitates larger safety stock to anticipate demand surges. Although hotel ballpoint pens are non-consumable, they are commonly used across multiple departments, such as front office and administration, requiring sufficient stock to ensure smooth daily operations.

Holding Cost and Ordering Cost Analysis

The analysis of holding and ordering costs was conducted to determine the inventory-related expenses arising from storage and procurement activities in the hotel warehouse. Holding costs represent expenses incurred from retaining inventory over a certain period, while ordering costs reflect expenses incurred each time the hotel places an order. This analysis aims to provide an overview of the inventory cost structure implemented by the

Receiving & Storekeeper department and addresses the second research question regarding the magnitude of inventory costs in the hotel warehouse (Heizer & Render, 2017).

Holding Cost

Holding cost was analyzed to determine the expenses arising from storing goods in the hotel warehouse over time, reflecting the financial consequences of stock level decisions, particularly for items stored for a certain period before use. In the hotel context, holding cost includes not only physical storage expenses but also indirect costs such as space utilization, shelving, stock control, and the risk of quality deterioration. In this study, holding cost was calculated using the formula: Holding cost = safety stock × average price × storage cost percentage**,** with the storage cost percentage estimated at 2–5% of the average item price, considering the hotel warehouse's limited space, high item movement frequency, and continuous inventory needs (Heizer & Render, 2017). This approach was adopted due to the unavailability of detailed actual storage cost data.

Table 5.
Holding Cost 15 Item

No	Item	Safety Stock	Average Price	Holding Cost
1.	tissue facial napkin	18	26,673.22	14,403.54
2.	tissue dinner napkin	43.2	7,595.00	9,843.12
3.	slipper hotel	600	2,150.00	38,700.00
4.	pensil logo	360	870	9,396.00
5.	shower cap	450	739.7	9,985.95
6.	cotton bud	390	439.28	5,139.58
7.	tooth brush	720	1,811.23	39,122.57
8.	ballpoint hotel	1,298.4	2,750.00	107,118.00
9.	nescafe stick	336	1,380.14	13,911.81
10.	brown sugar sachet	1,650	360	17,820.00
11.	palm sugar sachet	90	5,500	14,850.00
12.	white sugar sachet	2,250	270	18,225.00
13.	creamer sachet	750	335	7,537.50
14.	Cleo bottle 330 ml	21.6	1,563	1,012.50
15.	Dried Butterfly Flowers 250gr	3	150,000.00	13,500.00
Total Holding Cost				320,565.56

The holding cost calculation indicates that items such as hotel ballpoint pens, slippers, and toothbrushes incur higher storage costs compared to other items, due to the combination of relatively large safety stock and their average price, which increases the total holding cost borne by the hotel. To provide a clearer illustration, the holding cost results are presented in a graph showing the storage cost for each analyzed inventory item (Heizer & Render, 2017).

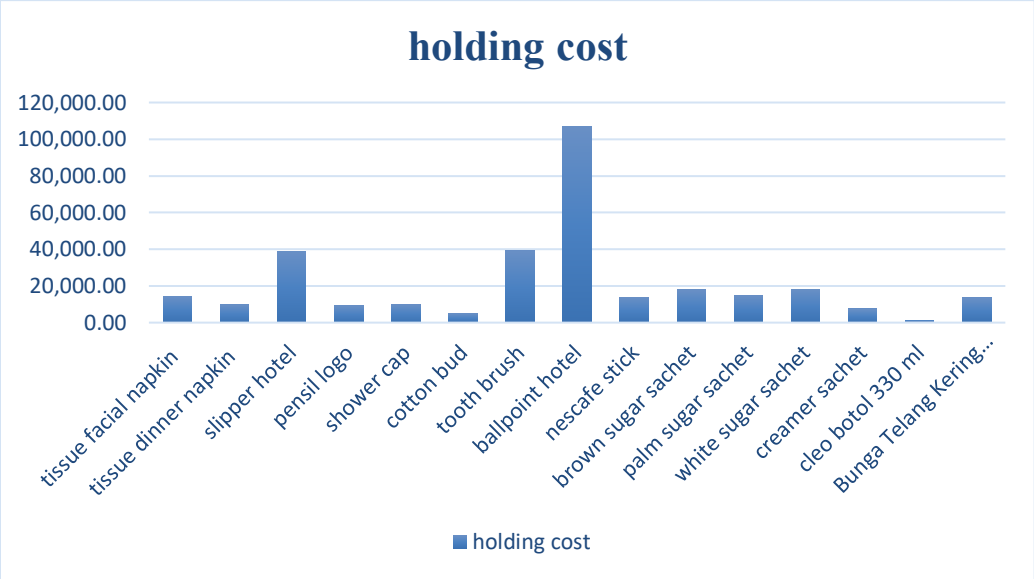

Figure 2:
Holding Cost per Item Graph
Source: Data processed by researchers (2025)

The chart illustrates the storage costs incurred by the hotel for each analyzed inventory item, showing variations in holding costs due to differences in usage patterns, stock levels, and item value. For instance, the high holding cost of hotel ballpoint pens is driven not only by large quantities but also by their distribution across multiple departments, including Front Office, Sales & Marketing, Accounting, and other operational areas, prompting the warehouse to maintain safe stock levels to prevent stockouts, albeit at higher storage costs. In contrast, hotel slippers and toothbrushes exhibit high holding costs mainly because they are essential amenities with consistent daily usage, critical to maintaining service standards, leading the Receiving & Storekeeper to keep relatively high stock levels to ensure smooth operations and guest satisfaction. Conversely, items with lower holding costs, such as dried butterfly pea flowers and certain consumables, reflect limited usage and smaller stock levels, indicating efficient inventory management that does not impose significant storage cost pressure on the hotel warehouse (Heizer & Render, 2017).

Ordering Cost

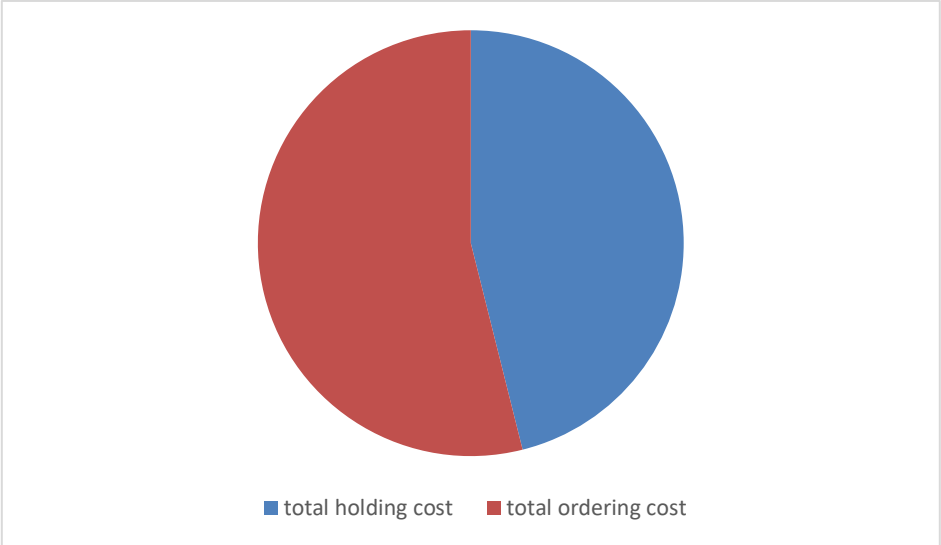

Figure 3:
Comparison Chart of Total Holding Cost and Ordering Cost
Source: Data processed by researchers (2025)

Based on the comparison diagram of total ordering cost and total holding cost, it is evident that the total ordering cost is more dominant than the total holding cost, indicating that ordering activities contribute more significantly to the inventory cost structure in the hotel warehouse. The predominance of ordering costs suggests a relatively high ordering frequency, even though inventory levels remain within optimal limits, reflecting a cautious inventory management approach that maintains stock at moderate levels to avoid space wastage and the risk of quality deterioration (Heizer & Render, 2017).

Inventory Optimization Index Analysis

The inventory optimization index analysis was conducted to assess whether previously analyzed stock levels fall within the established control limits defined by minimum and maximum stock parameters. This index identifies whether hotel warehouse inventory is in an optimal condition, overstocked, or at risk of stockout. Furthermore, the results directly address the third research question regarding the effectiveness of hotel warehouse inventory management based on the inventory optimization index (Heizer & Render, 2017).

Table 6.
Stock Optimization Index on 15 Items

No	Item	Current Stock	Min Stock	Max Stock	Status
1.	tissue facial napkin	60	30	60	Optimal
2.	tissue dinner napkin	144	72	144	Optimal
3.	slipper hotel	2,000	1,000	2,000	Optimal
4.	pensil logo	1,200	600	1,200	Optimal
5.	shower cap	1,500	750	1,500	Optimal
6.	cotton bud	1,300	650	1,300	Optimal
7.	tooth brush	2,400	1,200	2,400	Optimal
8.	ballpoint hotel	4,328	2,164	4,328	Optimal

9.	nescafe stick	1,120	560	1,120	Optimal
10.	brown sugar sachet	5,500	2,750	5,500	Optimal
11.	palm sugar sachet	300	150	300	Optimal
12.	white sugar sachet	7,500	3,750	7,500	Optimal
13.	creamer sachet	2,500	1,250	2,500	Optimal
14.	Cleo bottle 330 ml	72	36	72	Optimal
15.	Dried Butterfly Flowers 250gr	10	5	10	Optimal

Based on the Min–Max criteria—where optimal stock is defined as min ≤ current stock ≤ max, stockout as current stock < min, and overstock as current stock > max—analysis of all warehouse inventory items shows that current stock levels are equal to their respective maximum stock values. This indicates that the inventory is at the highest allowable limit within the control system but does not yet fall into the overstock category. A comparison of minimum, current, and maximum stock is presented in a graph to illustrate the status of all hotel warehouse items relative to the established Min–Max thresholds (Heizer & Render, 2017).

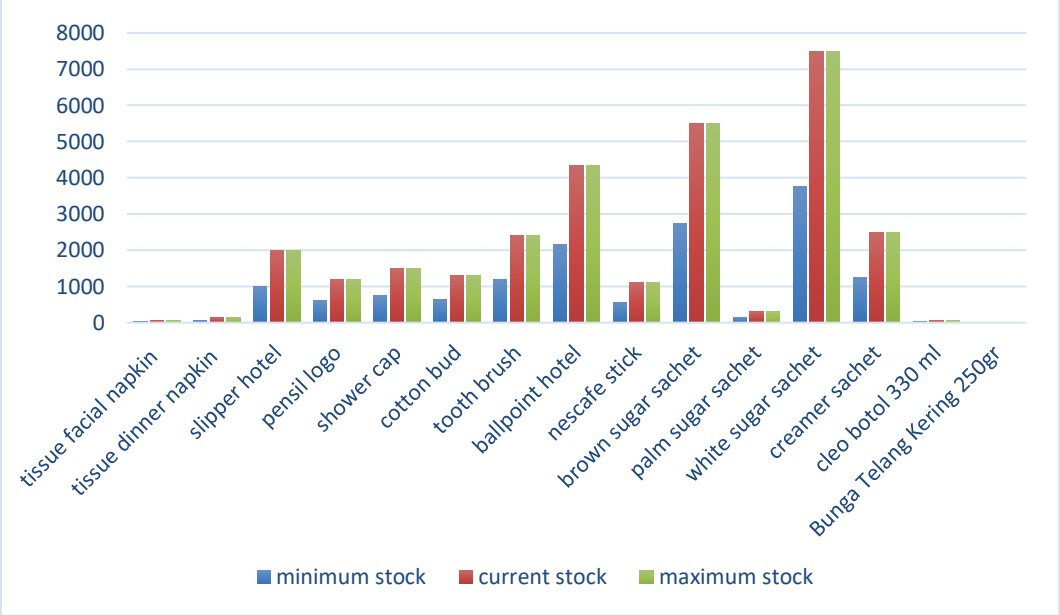

Figure 4:
Comparison Chart of Minimum, Current, and Maximum Stock
Source: Data processed by researchers (2025)

Based on the Min–Max criteria where optimal stock is defined as min ≤ current stock ≤ max, stockout as current stock < min, and overstock as current stock > max—analysis of the hotel warehouse inventory shows that current stock levels reach their respective maximum values, indicating they are at the highest allowable limit without exceeding it. A comparison of minimum, current, and maximum stock is presented in a graph to illustrate the status of all items relative to the established Min–Max thresholds (Heizer & Render, 2017)..

Discussion of Results

Interpretation of Calculation Results

Based on the Min–Max analysis, all inventory items in the hotel warehouse were maintained within optimal levels, demonstrating that the application of safety stock,

minimum stock, and maximum stock effectively balances item availability with stock control, minimizing the risks of stockouts and overstock. The findings indicate that items with high usage frequency, such as amenities (slippers, toothbrushes, shower caps) and consumables in Food & Beverage (sugar sachets, creamer, Nescafe sticks), require higher safety and minimum stock levels to ensure uninterrupted service. Conversely, items with lower daily usage, such as dried butterfly pea flowers and bottled water, have lower stock thresholds, reflecting their limited consumption and storage requirements.

Cost analysis showed that holding costs varied according to the combination of safety stock and average item price, with high-use and high-value items generating higher storage costs. Nevertheless, overall holding costs remained manageable within the hotel's operational budget. Ordering costs, on the other hand, were relatively higher than holding costs due to the need for frequent procurement to maintain service standards, which aligns with the principle that service-oriented operations often prioritize availability over minimizing storage (Bowersox, 2014; Heizer et al., 2015).

The results support the effectiveness of the Min–Max inventory system in hotel operations, confirming that a properly implemented stock control strategy can maintain operational readiness, optimize storage space, and manage costs efficiently. By adjusting stock levels according to actual consumption patterns, the hotel successfully avoids both stockouts and overstock, demonstrating a practical application of inventory optimization theory (Silver et al., 2017)

The analysis of hotel warehouse inventory using safety stock, minimum stock (ROP), and maximum stock parameters indicates that all items are maintained at optimal levels. Safety stock provides adequate reserves to anticipate demand uncertainty and delivery delays, while minimum stock effectively serves as a reorder point, ensuring smooth hotel operations. Maximum stock levels prevent excessive accumulation of inventory, maintaining warehouse efficiency. Cost analysis shows that ordering costs dominate over holding costs, reflecting a procurement pattern focused on regular ordering to minimize stockout risks. Furthermore, the inventory optimization index confirms effective stock management, with all items categorized as optimal, demonstrating that the Min–Max method serves as a reliable tool for monitoring and controlling warehouse operations in the Receiving & Storekeeper department.

Comparison with Previous Research

The findings of this study align with previous research on inventory control using the Min–Max method. Hermawan et al. (2025) found that Min–Max effectively maintains stock within optimal limits, minimizing both stockout and overstock risks, which is consistent with this study where all hotel inventory items were maintained within safe levels. Similarly, Octaviani and Fitriani (2022) emphasized that Min–Max balances stock quantities while preventing shortages, and Lentari (2022) demonstrated its effectiveness in reducing inventory imbalances in the LPG manufacturing sector. Ramadhan and Saifuddin (2024) also reported that Min–Max minimizes the risks of under- and overstock, confirming its applicability beyond manufacturing to service sectors such as hotels. Kinanthi et al. (2016) further highlighted that setting minimum and maximum stock limits helps identify excess inventory, which aligns with this study where most items were at maximum stock, reflecting a strategy to maintain safe availability. Regarding inventory costs, this study found total ordering costs higher than holding costs, indicating that the hotel warehouse's cost structure

is more influenced by ordering activities. This differs from Shofariah and Herdian (2024), who reported higher holding costs in the food industry due to large storage needs and spoilage risks, demonstrating that Min–Max's cost implications vary according to industry characteristics rather than reflecting a limitation of the method.

Practical and Theoretical Implications

Practically, this study highlights the importance for hotel management of applying minimum and maximum stock limits as an effective inventory control tool. The finding that ordering costs dominate provides a basis for evaluating ordering frequency without compromising stock availability. Theoretically, the results reinforce the effectiveness of the Min–Max method in balancing stock availability and inventory costs, supporting prior research indicating that inventory cost structures vary by industry. Notably, unlike manufacturing sectors where holding costs dominate, in the hotel industry ordering costs can be more significant. From a decision-making perspective, the Min–Max method serves as a preventive tool, guiding the Receiving & Storekeeper team to set rational stock limits and make data-driven ordering decisions. These findings extend inventory management theory by demonstrating that the Min–Max approach is adaptable beyond manufacturing, offering a practical framework for service industries with fluctuating demand patterns (Heizer et al., 2015).

CONCLUSION

This study demonstrates that inventory management in the hotel's Receiving & Storekeeper section is generally controlled and relatively optimal using the Min Max method. Current stock levels of all analyzed items remain within the established minimum and maximum thresholds, ensuring operational continuity without significant risk of stockout or overstock. Variations in safety stock across items reflect differences in consumption patterns and operational importance, allowing safety reserves to be adjusted according to each item's characteristics. From a cost perspective, total ordering costs exceed holding costs, indicating that the hotel prioritizes frequent ordering over maintaining large stock quantities in limited warehouse space, which remains reasonable in the context of service-oriented operations.

Practically, the Min Max parameters safety stock, minimum stock, and maximum stock should be used as guidelines for systematic inventory management. Regular evaluation is recommended to adapt to changes in hotel occupancy, guest consumption patterns, and operational policies. High-usage items may require gradual order adjustments to prevent stocks from constantly reaching the maximum limit, optimize warehouse capacity, and reduce total ordering costs without compromising operational availability. Managerially, the Min–Max analysis can support interdepartmental coordination and serve as a performance indicator for warehouse management in balancing stock availability and storage efficiency.

For future research, more detailed data on item usage and lead times are recommended to improve inventory calculations. Combining the Min–Max method with other inventory control techniques could provide insights into comparative efficiency and cost-effectiveness. Expanding the study to hotels of different classifications or other logistics areas would also enhance understanding of inventory management practices in the hospitality industry, allowing for more generalizable and comprehensive findings.

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