https://ejournal.unma.ac.id/index.php/jee/Home

Jurnal Elementaria Edukasia
p-ISSN 2615-4625
e-ISSN 2655-0857
Publisher: Program Studi PGSD Universitas Majalengka

Home

Jurnal Elementaria Edukasia is the Indonesian Journal of Elementary Education. This Journal is published by the Elementary Teacher Education Program, Majalengka University, fourth year in march, June, September and December. This Journal has been registered number p-ISSN 2615-4625 (Print) and e-ISSN 2655-0857 (Online).

Jurnal Elementaria Edukasia was initiated and established for the first time in January 2018. All topics that we received only articles relating to elementary education fields. For the research category, articles can be written using quantitative and qualitative approaches and can be made in a variety of research designs, such as action research, experiments, and case studies.

This journal has been **ACCREDITED** by the National Journal Accreditation (ARJUNA) Managed by the Ministry of Research, Technology, and Higher Education, Republic Indonesia with Fourth Grade (Peringkat 3, Sinta 3) since the year 2019 according to the decree No. 225/E/KPT/2022.

MENU
Editorial Team
Reviewers List
Focus and Scope
Publication Ethics
Author Guidlines
Peer Reviewer Process
Online Submission
Copyright and License Statement
Plagiarism Policy
Articel Processing Charge (APC)
Open Access Statement
Contact Us

SUPPORT

VISITOR

Journal title	: **Elementaria Edukasia**
Initials	: **JEE**
Frequency	: **4 issues per year (March, June, September and December)**
ISSN Online	: **2615-4625**
ISSN Print	: **2655-0857**
Publisher	: **Program Studi PGSD, Universitas Majalengka in collaboration with HIMPUNAN DOSEN PGSD INDONESIA.**

Jurnal Elementaria Edukasia
p-ISSN 2615-4625
e-ISSN 2655-0857
Publisher: Program Studi PGSD Universitas Majalengka

Editorial Team

https://ejournal.unma.ac.id/index.php/jee/issue/view/267

Jurnal Elementaria Edukasia
p-ISSN 2615-4625
e-ISSN 2655-0857
Publisher: Program Studi PGSD Universitas Majalengka

Vol. 7 No. 2 (2024): juni

Published: 2024-07-01

Articles

The Impact of Open-Ended Based Learning Modified by Realistic Mathematic Education on Computational Thinking Skills
Maryam Aunurrahim, Yurniwati Yurniwati, Faisal Madani
PDF
Abstract Views : 0 / Downloads Count: 0

The Impact of Problem-Posing Learning Method on Critical Thinking Skills in terms of Self-Confidence
Nurul Hermiyati, Yurniwati Yurniwati, Gusti Yarmi 2570-2582
PDF
DOI : https://doi.org/10.31949/jee.v7i2.9336 Abstract Views : 0 / Downloads Count: 0

Leveraging Inventory Management for Enhanced Performance in Elementary School Cooperatives: Case Study from Majalengka Regency
Sutarman Sutarman, Agus Purnomo, Putri Mety Zalynda 2890-2899
PDF
DOI : https://doi.org/10.31949/jee.v7i2.10155 Abstract Views : 0 / Downloads Count: 0

Analysis of the Ideals and Reality of the Leadership Style of the Ministry of School in the Application of the Pancasila Student Profile Strengthening Project
I Nyoman Yadi Anggara Putra, Kadek Hariana, Arif Firmansyah, Muchdar 2900-2915
PDF
DOI : https://doi.org/10.31949/jee.v7i2.9201 Abstract Views : 0 / Downloads Count: 0

Improving Students' Social Interaction through Nojapi-Japi Traditional Game at SD Negeri Kele'I
English
Andi Imrah Dewi , Delviana Kristina Wendur , Arif Firmansyah, Kadek Hariana 2916-2931
PDF
DOI : https://doi.org/10.31949/jee.v7i2.9367 Abstract Views : 0 / Downloads Count: 0

Development of Recycled Media in SBdP Learning to Increase Student Learning Activity
Anggy bagas Ramadhan, Putri Rahayu S Institut Daarul Qur'an Jakarta, Zubaidi Institut Daarul Qur'an Jakarta 2932-2942
PDF
DOI : https://doi.org/10.31949/jee.v7i2.10055 Abstract Views : 0 / Downloads Count: 0

Jurnal Elementaria Edukasia
Volume 7, No. 2, Juni 2024, 2890-2899
DOI: 10.31949/jee.v7i2.10155

p-ISSN 2615-4625
e-ISSN 2655-0857

Leveraging Inventory Management for Enhanced Performance in Elementary School Cooperatives: Case Study from Majalengka Regency

Sutarman
Universitas Telkom, Bandung
sutarman@telkomuniversity.ac.id

Agus Purnomo
Universitas Logistik dan Bisnis Internasional, Bandung
aguspurnomo@ulbi.ac.id

Putri Mety Zalynda
Universitas Pasundan, Bandung
putri.mety@unpas.ac.id

Submitted: 2024-05-06
Revised: 2024-06-17
Accepted: 2024-06-18

ABSTRACT
Cooperatives play a significant role in promoting economic growth by not only increasing community income but also providing employment opportunities in the small business sector. For cooperatives to effectively support the economic development of villages, it is crucial for them to function as healthy business entities. One way to enhance their efficiency is by ensuring consistency in their managerial activities, ranging from planning to control, including inventory management. SD "X" Cooperative, located in Majalengka, engages in retail trading activities through a mini market. The cooperative deals with 19 specific types of items, which require strict inventory control. The governance process starts with determining the optimal quantity of economic orders to avoid shortages or excessive inventory of goods, thus ensuring satisfactory customer service. However, the cooperative currently faces challenges in terms of working capital shortage, hindering its ability to place orders according to the predetermined optimal quantity. Therefore, it becomes imperative to redefine the optimal order placement process by considering the available working capital. Such re-optimization will have an impact on increasing inventory costs, as the optimal order quantity decreases and the frequency of orders becomes more frequent. Despite the decrease in the optimal number of orders, the cooperative strives to fulfill customer demands while managing its limited working capital effectively.
Keywords: *Retail inventory; Multi items; Working capital; Optimization*

INTRODUCTION

Inventory management in manufacturing corporations is considered a non-value-adding activity and a cost center. The ideal scenario is to have zero inventory, but if that is not possible, efforts should be made to minimize it. The concept of lean manufacturing is widely recognized in the industry as a means to reduce waste, including inventory waste. Keeping inventory in the warehouse does not create any added value (Umry et al., 2019). However, for businesses involved in trade, such as mini markets, inventory availability is necessary to enhance customer service. In both manufacturing and service corporations, inventory serves the

purpose of ensuring that customer demands are met. Ahmad et al. (2016) argue that effective inventory management is a crucial success factor, demonstrating a company's efficiency in controlling its inventories. Nevertheless, there is limited information available on inventory management practices specifically in small business settings.

Two main issues always arise in inventory management: (1) what is the economic order size and (2) when to place the order, both of which must be decided to ensure the continuity of the company's operations and be able to meet customer needs at low cost. Once the economic order size and ordering time have been determined, the next issue is the available funds to buy it. If the finance manager states insufficient funds to purchase the required goods, then the purchasing department cannot make purchases according to the predetermined quantity and time.

Inventory in the retail industry is highly variable, and the amount of demand is highly dependent on holidays. The main challenge in managing retail inventory is to harmonize replenishment and demand so that the availability of goods on the shelves matches the demand of future buyers. In practice, economic supply sizes are insufficient due to variations in demand, often leading to stock-outs and excess inventory (Ehrenthal et al., 2014). Determining the economic order size reset point by considering the available funds solves this complex problem. Limited funds cause the initial optimal order size to be recalculated. One of the impacts of recalculation is the decrease in the optimal order size, resulting in increased order frequency, which can cause total inventory costs to increase. This classic problem is experienced by a small mini-market business managed by a cooperative in Majalengka district.

Majalengka Regency boasts strategic transportation infrastructure, including an International Airport and two toll highways that connect the capital city of Jakarta and the city of Bandung, the capital of West Java, with the new airport. The presence of these crucial infrastructures has had a positive impact on the growth of manufacturing and service businesses. Cooperatives play a crucial role in promoting economic growth by meeting various community needs, such as clothing, food, and other essentials. Primary School Cooperatives also play a pivotal role in the education and development of students. These cooperatives introduce students to basic entrepreneurial and economic concepts, foster character development, enhance social skills, and provide practical experience in organizational management. In addition to improving the economic well-being of the school and offering affordable goods, Primary School Cooperatives also foster creativity, innovation, and environmental education. Through these cooperative activities, students learn important values such as honesty, responsibility, and cooperation, while developing skills that will benefit them in their future lives. Furthermore, these cooperatives contribute to the improvement of facilities and support school activities. One example of a thriving cooperative business is the mini market business. Hence, the focus of this research is the Cooperative at Elementary School "X," which manages a mini market in Majalengka district.

The Cooperative mini market at Elementary School "X" manages a wide range of goods, with a high number of each variant. To effectively control these goods, prioritization through ABC analysis is necessary. In addition to catering to the needs of students and teachers at Elementary School "X," the Minimarket also serves the community by offering 59 types of goods, each with varying quantities and prices. After conducting ABC analysis, 19 types of goods have been identified as priority items. The purchasing department procures these priority items simultaneously, based on a predetermined optimization process. However, the purchasing department faces challenges due to insufficient funds required to purchase the specified quantity of items. Consequently, the finance department requests a reduction in the number of items ordered. As a result, the purchasing department must determine an order size that aligns with the available funds while still ensuring excellent customer service.

Based on the aforementioned description, the problem formulations in this study are as follows:

(1) Can the optimal order size of goods in a mini market, without any constraints on working capital, be fulfilled with the currently available working capital?

(2) What is the ideal order size when utilizing an inventory model that incorporates working capital constraints?

(3) What are the resulting changes in total inventory cost and working capital when employing an inventory model with working capital constraints?

METHODS

Deterministic Inventory

In deterministic inventory problems involving independent items, the determination of the economic order quantity relies on two crucial variables: the storage cost and the cost per order. This determination assumes that (1) there will be no shortage, (2) orders will be placed in their entirety once the inventory is depleted, (3) the demand remains constant and known, (4) there is a fixed and constant lead time, and (5) there are no quantity discounts available. The calculation of the economic order quantity is achieved through a mathematical optimization process that balances the cost of storage with the cost per order, as illustrated by the following equation:

$$TC = \frac{FP_i Q_i}{2} + \frac{CR_i}{Q_i} \quad (1)$$

$$TC = \frac{FP_i Q_i}{2} + CR_i Q_i^{-1}$$

$$\frac{dTC}{dQ} = \frac{FP_i}{2} - CR_i Q_i^{-2} = 0$$

$$\frac{FP_i}{2} = \frac{CR_i}{Q_i^2}$$

Based on equation (1), the optimum order size is obtained as follows:

$$Q_i^2 FP_i = 2CR_i$$
$$Q_i^2 = \frac{2CR_i}{FP_i}$$
$$Q_i^* = \sqrt{\frac{2CR_i}{FP_i}} \quad (2)$$

Dimana:
R_i : number of requests for item (i)
P_i: Price for each item (i)
F : Percentage of storage cost per unit in a year
C: Cost per order
Q_i^*: Economic order quantity for item (i)

The formula in equation (2) is highly valuable for inventory control in a corporate setting, as emphasized by Munyaka et al. However, it should be noted that the optimization process results obtained from the inventory system, as presented in formulations (1) and (2), do not always guarantee their feasibility due to various empirical constraints. These constraints include: (1) limitations in working capital, (2) restrictions on warehouse capacity, and (3) the occurrence of both working capital and warehouse capacity constraints. These three constraints are highly realistic, particularly within deterministic inventory scenarios. Bhattacharjee et al. (2018) further assert that, in addition to working capital limitations, inventory managers frequently face the challenge of limited warehouse capacity in practical conditions. The situation becomes even more complex when both constraints occur simultaneously, wherein the available working capital is insufficient and the warehouse lacks the capacity to store the ordered goods. Despite these limitations, it is crucial to fulfill customer demand and avoid missed sales opportunities. The inventory optimization model (2) merely considers storage and order costs when placing an order, without taking into account the available working capital for purchasing the ordered goods. Therefore, an inventory model that incorporates working capital is an indispensable approach.

Economic Order Size with Working Capital Constraints

One of the primary functions of working capital is to ensure liquidity, enabling a company to finance its operations and meet short-term debt obligations. In practical situations, however, there is often insufficient funds available for purchasing goods from suppliers, which poses a significant obstacle. According to Benmamoun et al. (2018), if supplier payments exceed the

total value of inventory and commercial income, the need for working capital becomes less critical. Working capital is determined based on the balance sheet, accounts receivable, inventory, and liabilities at a specific point in time. Improving the working capital requirement involves reducing it or even transforming it into a working capital surplus.

This research focuses on inventory control for compound items under the constraint of working capital. The following presents the formulation of certain variables and the notation employed. Let M represent the average investment in inventory, while the optimized mathematical function is denoted as B, representing the combined total of order and storage costs, subject to constraint b. The formulation is as follows:

$$\text{Minimize B} = \sum_1^n \frac{R_i C}{Q_i} + \sum_1^n \frac{Q_i P_i F}{2}$$

$$= \sum_1^n \left(\frac{R_i C}{Q_i} + \frac{Q_i P_i F}{2} \right) \quad (3)$$

$$\text{Subject to b} = \sum_1^n \frac{P_i Q_i}{2} = \text{M} \quad (4)$$

To minimize the objective function B, considering the single constraint of working capital, it can be further developed into a new function Z, as follows:

$$Z = C\sum_1^n \frac{R_i}{Q_i} + F \sum_1^n \frac{P_i Q_i}{2} + \beta \sum_1^n \frac{P_i Q_i}{2} - M \quad (5)$$

Upaya meninimumkan fungsi objektif B adalah dengan cara meminimumkan fungsi Z, dengan mempertimbangkan nilai Q dan β, maka melalui proses diferensiasi, diperoleh:

$$Z = C\sum_1^n R_i Q^{-1} + F\sum_1^n \frac{P_i Q_i}{2} + \beta \sum_1^n \frac{P_i Q_i}{2} - M$$

$$\frac{dz}{dQ} = - C\sum_1^n \frac{R_i}{Q^2} + F\sum_1^n \frac{P_i}{2} + \beta\sum_1^n \frac{P_i}{2} = 0$$

$$C \sum_1^n \frac{R_i}{Q^2} = (F + \beta) \sum_1^n \frac{P_i}{2}$$

$$\frac{C \sum_1^1 R_i}{Q^2} = \frac{(F+\beta) \sum_1^n P_i}{2}$$

$$Q^2 = \frac{2C \sum_1^n R_i}{(F+\beta) \sum_1^n P_i}$$

$$Q^* = \sqrt{\frac{2CR_i}{(F+\beta)P_i}} \quad (6)$$

sedangkan β, diperoleh melalui penggunaan *Lagrange Multiplier Method* menjadi:

$$\beta = \frac{C(\sum_1^n \sqrt{P_i R_i})^2}{2M^2} - F \quad (7)$$

Research steps

The research stages of the working capital-constrained inventory problem, are as follows, represented in Figure 1:

a. Identify items that should be prioritized for tight control.
b. Identify demand data, prices, storage costs, and order costs for each item (i) that is a priority for control.
c. Calculate the amount of EOQ, order frequency, average inventory quantity, inventory cost, and working capital required to purchase the item (i).
d. Identify the working capital available to purchase all items.
e. Compare the amount of working capital available with the working capital required.
f. If the available working capital is less than the required working capital, use the working capital constrained inventory formulation.
g. Calculate the amount of the constant β for all items, then calculate the amount of the new EOQ, order frequency, average inventory, and inventory cost.
h. Compare EOQ, frequency, average inventory, and inventory cost before and after working capital constraints and calculate the difference.
i. Summarize the improvements brought about by the Persdian Model that considers working capital.

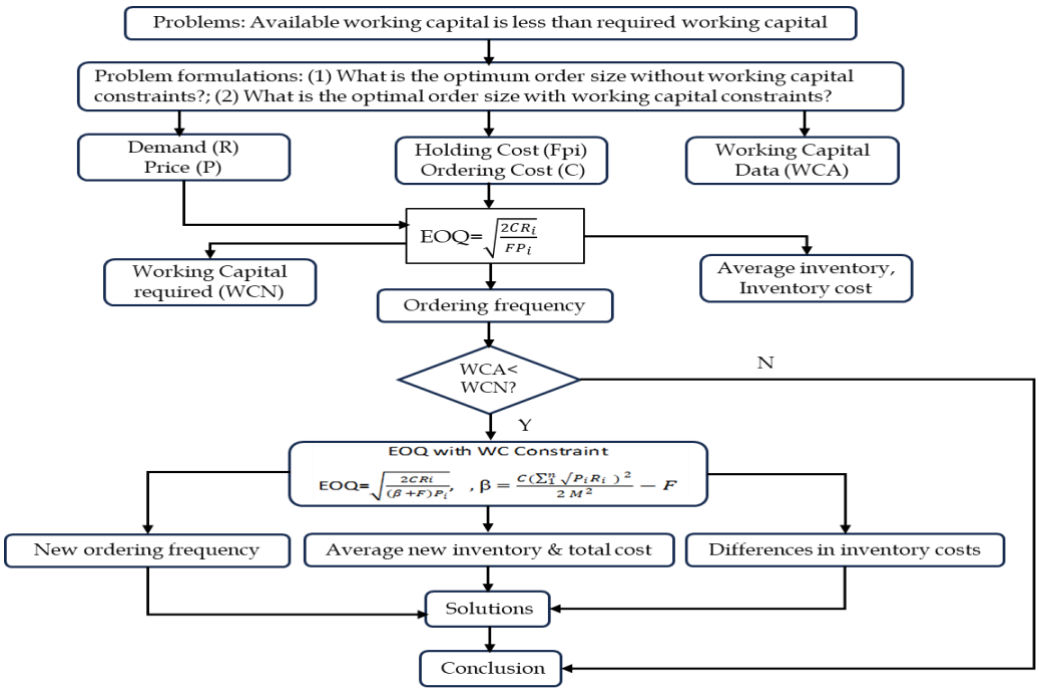

Figure 1. Flow chart of Inventory Model with Working Capital constraints

RESULTS AND DISCUSSION

The Cooperative mini market located at Elementary School "X" in Majalengka, is involved in the retail business of a mini market. The mini market offers a variety of goods, totaling 59 types. Based on the ABC analysis, which prioritizes strict handling, there are 19 types of goods

that are given priority. The company follows the EOQ (Economic Order Quantity) model to determine the order size for goods from suppliers. For the priority items, data on the annual demand, unit price of goods, and order costs are considered. The order costs for all items are consistent at IDR 50,000, while the storage costs account for 10% (F) of the total. This information is utilized in equations (2), (6), and (7) to aid decision-making. Table 1 presents crucial information for decision-making, including the order size, optimal order quantity, and order frequency for the 19 priority items at the elementary school cooperative mini market.

Based on the information from the table 1, the total inventory cost that the company must bear, according to equation (1), is 8,110,300 when involving the value of goods to 19,342,300. At the same time, the amount of working capital that must be provided each time it will buy goods from suppliers is $\sum_1^{19} \frac{P_i Q_i}{2} = \frac{81.103.000}{2} = 40.551.500,$ the number of order frequencies that must be made in a year is 79 times, then the accumulated working capital required to purchase goods to suppliers is IDR 3,203,568,500. The company cannot fulfil This amount of funds due to limited working capital. One effort is to reduce the number of order sizes through the optimization process by considering working capital constraints. However, it risks increasing the frequency of orders, but consumer demand can be met because the number of orders decreases according to the availability of working capital.

Table 1. Economic order size, order frequency without constraints Working Capital

(i)	(R_i)	(P_i)	$(P_i R_i)$	$Q_i^* = \sqrt{\frac{2CRi}{FPi}}$	$(P_i Q_i^*)$	$(\frac{R_i}{Q_i^*})$
LPG gas: 3 kg	5,892	20,000	117,840,000	543	10,860,000	10.85
On Bold 12	5,376	14,500	77,952,000	609	8,830,500	8.83
Cooking Oil: 1 kg	2,016	14,000	28,224,000	380	5,320,000	5.30
Sin Kujang Mas Kret 12	1,020	18,000	18,360,000	238	4,284,000	4.29
Sin Platinum Kretek 12	1,128	15,500	17,484,000	269	4,169,500	4.19
Sin Sapujagat	924	18,500	17,094,000	224	4,144,000	4.125
Sin Provost	624	25,000	15,600,000	158	3,950,000	3.95
Gudang Garam Surya 16	372	32,000	11,904,000	108	3,456,000	3.45
Granulated sugar: 1kg	876	13,000	11,388,000	260	3,380,000	3.37
Class Mild 16	432	26,000	11,232,000	129	3,354,000	3.35
Kapal Api Sp renceng	888	12,500	11,100,000	267	3,337,500	3.33
Wheat paying: 1 kg	1,140	9,500	10,830,000	346	3,287,000	3.29
Chicken egg	348	30,000	10,440,000	108	3,240,000	3.22
Fitri Oil	624	16,000	9,984,000	197	3,152,000	3.17
Sin Kujang normal	648	14,000	9,072,000	215	3,010,000	3.01
Mie Sedap	2,976	3,000	8,928,000	996	2,988,000	2.99
GG Filter	360	24,000	8,640,000	123	2,952,000	2.93
Dunhill Black 16	312	24,500	7,644,000	113	2,768,500	2.76
Neslife	300	23,000	6,900,000	114	2,622,000	2.63
Total			410,616,000		81,103,000	79.035

Based on Table 1, the company often faces liquidity problems every time an order is placed. Namely, the available working capital is often less than the optimized amount, so it cannot purchase goods according to the specified order quantity, while the average working capital that can be provided to purchase goods to suppliers is 25,000,000. Due to limited working capital, the optimized order size must be re-optimized by considering these limited working capital constraints. In order to obtain the new order size, the constraint factor β must be calculated, and based on the formulation in equation (7), $\beta = \frac{50000\,(87{,}120.31)^2}{2(25{,}000{,}000)^2} - 0{,}1 = 0{,}204$ is obtained.

Table 2. Economic ordering size, ordering frequency with Working Capital constraints

I	R_i	P_i	P_iR_i	$\sqrt{P_iR_i}$	$Q_i^*=\sqrt{\frac{2CR_i}{(\beta+F)P_i}}$	$\frac{R_i}{Q_i^*}$	$P_iQ_i^*$
LPG gas: 3 kg	5,892	20,000	117,840,000	10,855.4	311	18.95	6.220.000
On Bold 12	5,376	14,500	77,952,000	8,829.04	349	15.40	5.060.500
Cooking Oil: 1 kg	2,016	14,000	28,224,000	5,312.63	218	9.23	3.052.000
Sin Kujang Mas Kret 12	1,020	18,000	18,360,000	4,284.85	137	7.45	2.466.000
Sin Platinum Kretek 12	1,128	15,500	17,484,000	4,181.39	155	7.30	2.402.500
Sin Sapujagat	924	18,500	17,094,000	4,134.49	128	7.22	2.368.000
Sin Provost	624	25,000	15,600,000	3,949.68	91	6.86	2.275.000
Gudang Garam Surya 16	372	32,000	11,904,000	3,450.22	62	6.00	1.984.000
Granulated sugar: 1kg	876	13,000	11,388,000	3,374.61	149	5.88	1.937.000
Class Mild 16	432	26,000	11,232,000	3,351.42	74	5.84	1.924.000
Kapal Api Sp renceng	888	12,500	11,100,000	3,331.67	153	5.80	1.912.500
Wheat paying: 1 kg	1,140	9,500	10,830,000	3,290.90	173	6.59	1.643.500
Chicken egg	348	30,000	10,440,000	3,231,10	62	5.61	1.860.000
Fitri Oil	624	16,000	9,984,000	3,159.75	113	5.52	1.808.000
Sin Kujang normal	648	14,000	9,072,000	3,011.98	115	5.63	1.610.000
Mie Sedap	2,976	3,000	8,928,000	2,987.98	326	9.13	978.000
GG Filter	360	24,000	8,640,000	2,939.39	70	5.14	1.680.000
Dunhill Black 16	312	24,500	7,644,000	2,764.78	65	4.80	1.592.500
Neslife	300	23,000	6,900,000	2,626.79	66	4.55	1.518.000
Total				87,120.3		142.9	44.291.500

By employing equation (6), we derive a novel inventory policy measure that takes into account the constraints imposed by working capital, as presented in table 2. As a result of reoptimization actions necessitated by limited working capital, the inventory cost experiences a significant increase to 9,359,575, owing to a surge in the order frequency from 79 to 143 times annually. The disparity in inventory costs attributable to limited working capital amounts to 1,249,275, whereas the corresponding variance in working capital stands at 15,551,500.

CONCLUSION

Inventory management issues always arise dynamically because many factors affect it, including both technical and strategic factors. Technical factors typically revolve around cost efficiency, while strategic factors involve aligning management to allocate funds for procuring goods required by customers. This enables the company to fulfil customer demand promptly and accurately. The objective of this study is to optimize the number of orders placed by the company, ensuring that customer demand is met within the limits of available working capital. Limited working capital results in suboptimal purchase quantities, prompting the company to implement new strategies that align with the available working capital. The analysis yielded two important findings:

1. The optimization model for economic order quantity necessitates working capital funds amounting to IDR 40,551,500 for a single purchase from a supplier. With an order frequency of 79 times per year, implementing this decision would result in inventory costs of IDR 8,110,300. However, considering the available working capital of only IDR 25,000,000, it is insufficient to place an order. Therefore, an inventory model that accounts for working capital needs to be used.
2. The order size determined by the inventory model that considers working capital is presented in table 2, column six. By taking into account working capital, changes in order size would lead to an increased order frequency, from 79 to 143 times per year. Consequently, the total inventory cost would rise to IDR 9,359,575, but working capital would decrease.
3. The limited working capital results in an initial increase in inventory costs of IDR 1,249,275, which amounts to a 15% increase. Additionally, there is a decrease in working capital of IDR 15,551,500.

REFERENCES

Ahmad, K. and Zabri, S.M. (2016): *Inventory management practices among Malaysian micro retailing enterprises.* A Journal of the Academy of Business and Retail Management (ABRM), 11(1): pp. 103-115.

Benmamoun, Z, H. Hchimi, A. Amine (2018): *Comparison of Inventory Models for Optimal Working Capital; Case of Aeronautics Company,* IJE TRANSACTIONS A: Basics Vol. 31, No. 4, pp 605-61

Bhattacharjee, Rupak, Bibhas C. Giri, Ayan Chakraborty (2018): *An optimal policy for an integrated vendor-buyer model with two warehouses under vendor's capacity constraint*, Int. J. Inventory Research, Vol. 5, No. 1, pp 13-18

Chopra, S. and Meindl, P. (2016): *Supply chain management: Strategy, planning, and operation*. Pearson Education, 6th-Edition.

Christopher M. (2005): Logistics and supply chain management: Creating value-adding networks.Pearson Education, 4th Edition.

Ehrenthal, D. Honhon, T. Van Woensel (2014): *Demand Seasonality In Retail Inventory Management*, European Journal of Operational Research,

Feng, H., Li, J. and Zhao, D. 2013: *Retailer's optimal replenishment and payment policies in the EPQ model under cash discount and two-level trade credit policy*. Applied Mathematical Modelling, 37(1), pp. 3322–3339.

Goyal, S. K. (1985). *Economic order quantity under conditions of permissible delay in payments.* Journal of the Operational Research Society, 36, 335–338.

Huang, Y.F. (2007): Optimal retailer's replenishment decisions in the EPQ model under two levels of trade credit policy, European Journal of Operational Research, 176(3), pp. 1577–1591.

Jauhari, W.A. and Winingsih, K. (2016): '*Cooperative inventory model for vendor-buyer system with quantity and freight discounts*', International Journal of Services and Operations Management, Vol. 25, No. 4, pp.508–530.

J.B Munyaka, B.J, Yadavalli, VSS, (2022):*Inventory Management Concept and Imolementation: A Systematic Review,* South Africa Journal of Industrial Engineering, vol 33(2) pp 15-36

Limansyah, T., Dharma, L. and Ign, S. (2020): *Economic order quantity model with deterioration factor and all-units discount. Journal of Physics*: Conference Series, 1490(1), 012052.

Pal, Manisha, Anwesha Samanta, (2018): *Inventory model for non-instantaneous deteriorating item with random pre-deterioration period*, Int. J. Inventory Research, Vol. 5, No. 1, pp 2-13S.

Pervin, M., Mahata, G.C. and Roy, S.K. (2015) '*An inventory model with declining demand*

Market for deteriorating items under a trade credit policy', Int. J. Manag. Sci. Eng. Manag., October, Vol. 11, No. 4, pp.1–9.

Rajeev, N (2008): *Inventory management in small and medium enterprises: A study of machine tool enterprises in Bangalore* 'Management Research News, vol. 31, no.9, pp. 659-669.

Samanta, A. and Pal, M. (2015) '*Periodic review inventory policy for non-instantaneous*

Deteriorating items with time dependent deterioration rate', Pak. J. Statist. Oper. Res., Vol. XI, No. 3, pp.409–419.

Shon, K, S, Sharma Kumar, Satyam (2019): *Effect of Ramp Type Demand on Production Inventory Mode, International Journal of Inventory Control and Management* vol. 8 No 1 pp 17-37

Sidik, Ahmad (2019): *The Analysis of Medicine Inventory Control in a Hospital,* Sci.Int.(Lahore),31(5),pp771-776

Teng, J.-T. (2002): *On the economic order quantity under conditions of permissible delay in payments.* Journal of the Operational Research Society, 53, 915–918

Umry Faisal, Tengku, Moses L Singgih (2019): *Inventory Management and Reorder Point (ROP) Strategy Using ABC Analysis Methods in Textile Manufacture,* IPTEK Journal of Proceedings Series No. (5) pp 1-7