

INVENTORY MANAGEMENT ANALYSIS FOR LIGHT STEEL ASSEMBLY OPTIMIZATION IN CV. NIRA JAYA ABADI, EAST LAMPUNG

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ABSTRAK

Persaingan bisnis di Indonesia semakin ketat seiring dengan semakin banyaknya wirausahawan dan perusahaan baru. Salah satu sektor yang penting adalah industri konstruksi khususnya atap bangunan yang berfungsi sebagai pelindung dari unsur cuaca dan benda jatuh. Pentingnya persediaan bahan baku untuk kelancaran produksi sangatlah penting, karena mempengaruhi proses produksi dan biaya operasional. Penelitian ini bertujuan untuk menganalisis manajemen persediaan bahan baku dalam memenuhi permintaan perakitan baja ringan di CV. Nira Jaya Abadi di Kabupaten Way Jepara, Lampung Timur. Metode pengumpulan data yang digunakan adalah dokumentasi dan wawancara. Hasil penelitian menunjukkan bahwa pengelolaan persediaan bahan baku di CV. Nira Jaya Abadi belum optimal pada tahun 2023. Dengan menggunakan metode Economic Order Quantity (EOQ), diketahui jumlah pembelian bahan baku yang ekonomis sebanyak 3.623 unit, sedangkan rata-rata pembelian yang dilakukan perseroan hanya 1.617 unit. Hal ini mengakibatkan frekuensi pembelian lebih tinggi yaitu 12 kali dalam setahun dibandingkan frekuensi optimal yaitu 5 kali. Akibatnya biaya pemesanan dan persediaan bahan baku meningkat, dengan biaya persediaan mencapai Rp19.440.670, sedangkan biaya optimal menurut perhitungan EOQ adalah Rp17.065.510,5. Inefisiensi ini menyebabkan perusahaan menanggung biaya tambahan serta risiko kerusakan bahan baku.

Kata Kunci : Persediaan Bahan Baku, Pemenuhan Permintaan

ABSTRACT

Business competition in Indonesia is getting tighter along with the increasing number of entrepreneurs and new companies. One of the important sectors is the construction industry, especially the roofs of buildings that function as protection from weather elements and falling objects. The importance of raw material inventory for smooth production is crucial, because it affects the production process and operational costs. This study aims to analyze the inventory management of raw materials in meeting the demand for light steel assembly in CV. Nira Jaya Abadi in Way Jepara District, East Lampung. The data collection methods used are documentation and interviews. The results of the study show that the management of raw material inventory in CV. Nira Jaya Abadi is not yet optimal in 2023. Using the Economic Order Quantity (EOQ) method, it was found that the number of economical purchases of raw materials was 3,623 units, while the average purchase made by the company was only 1,617 units. This results in a higher frequency of purchases, which is 12 times a year, compared to the optimal frequency of 5 times. As a result, the cost of ordering and inventory of raw materials increased, with inventory costs reaching IDR 19,440,670, while the optimal cost according to the EOQ calculation was IDR 17,065,510.5. This inefficiency causes the company to bear additional costs as well as the risk of damage to raw materials.

Keywords: Raw Material Inventory, Demand Fulfillment

INTRODUCTION

The development of the business world in Indonesia is currently experiencing rapid growth, with more and more individuals entering the world of entrepreneurship. This

phenomenon causes competition in business to become increasingly fierce, both in terms of service, product quality, and applied technology. One of the important components in the construction of a building is the roof, which

It functions as a protector from weather elements such as heat, rain, and wind, as well as prevents foreign objects from entering the room. With technological advances and increasing needs in the construction field, a wide selection of materials for building roofs are available on the market, which are selected based on technical, economic, and aesthetic aspects (Hadi, 2022).

In Indonesia, the use of mild steel as an alternative to wood materials for roof construction is increasingly popular. Mild steel offers a number of advantages, such as faster installation times, resistance to termites and corrosion, and better structural strength compared to conventional wood or steel (Sari, 2023). Mild steel, which is a type of cold canal steel with high quality, requires special coatings such as Galvanized, Galvalume, Zinalume, or ZAM to prevent corrosion (Susanto, 2021).

The importance of raw material inventory management in supporting the smooth production process is a crucial aspect in the company. Adequate supply of raw materials greatly affects the company's ability to meet consumer demand and manage production costs (Hendrik, 2024). In the context of a light steel assembly company in Way Jepara, inadequate raw material inventory can hinder the fulfillment of market demand, as indicated by data from CV. Nira Jaya Abadi which shows that the supply of raw materials is often insufficient to meet the amount of demand.

Table 1. Light Steel Assembly Demand for January-December 2020 (in bars)

Moon	Raw Inventory	Material	Number of Requests
January February March April	329		410
May June	346		375
July	361		380
August September October	352		365
November	368		370
December	392		450
	406		445
	410		450
	432		462
	467		497
	507		557
	508		598

In table 1 above, the amount of steel raw material inventory has not been able to meet the demand for light steel assembly, this is due to the difficulty in ordering the steel raw materials.

Table 2. Order Fee, Storage Fee, and Inventory Fee for Raw Materials for Light Steel Assembly (in rupiah)

Moon	Booking Fee	Storage Fees	Total Inventory Cost

January	February	March	10.231.200	1.123.120	10.354.320
April	May	June	10.284.400	1.128.440	10.412.840
July	August	September	10.349.000	1.134.900	10.483.900
October		November	10.406.000	1.140.600	10.546.600
December			10.479.100	1.147.810	10.625.910
			10.540.500	1.154.050	10.694.550
			10.634.100	1.163.410	10.797.510
			10.724.000	1.172.400	10.896.400
			10.740.000	1.174.000	10.914.000
			10.828.000	1.182.800	20.010.800
			20.017.200	2.201.720	20.218.920
			20.181.200	2.218.120	20.399.320

Based on table 2 above, the amount of raw material supply costs for light steel assembly that must be borne by the company as a result of the supply of raw materials continues to increase. (Siregar, E., & Kartika, R. 2018)

In addition, the analysis of order costs, storage costs, and total inventory costs shows that these costs have increased significantly from month to month, which has an impact on the company's cost efficiency (Table 2) (CV. Nira Jaya Abadi, 2023). Therefore, this study aims to analyze the management of raw material inventory to minimize failures in the production process and increase the effectiveness of meeting the demand for light steel assembly in CV. Nira Jaya Abadi, Way Jepara

The purpose of this study is to find out and analyze how the supply of raw materials can meet the demand for light steel assembly in CV. Nira Jaya Abadi, Way Jepara. This research aims to provide insight into more effective management of raw material inventory in the context of light steel production. (Sutrisno, A. 2017) The benefit of this research is to help CVs. Nira Jaya Abadi in improving the effectiveness and efficiency of the production process, providing theoretical and practical knowledge for writers, and providing useful research references for students of the Bakti Nusantara Institute in the future (Susanto, 2021).

METHODS

The conceptual limitation in this study is limiting the supply of raw materials to meet demand. According to (Sugiyono 2002), research variables are attributes or traits of people, objects, or activities that have certain variations that are studied and inferred by researchers:

The data collection method is used to reveal the variables to be studied. In this study, the data collection methods used are documentation method is carried out by viewing and recording data in documents or notebooks in the company. This method is used as a complement when the data cannot be disclosed by other methods. (Kontjaraningrat 2001: 185) states that data in documents is often the only way to learn about certain problems that can no longer be observed or remembered. In this study, the documentation records and studies data related to the supply of raw materials to meet the demand for light steel assembly in CV. Nira Jaya Abadi Way, Jepara, East Lampung. (Koentjaraningrat, 2001) The interview technique was carried out by direct questions and answers to the respondents, namely the owner of a light steel assembly company in CV. Nira Jaya Abadi Way, Jepara, East Lampung.

RESULT AND DISCUSSION

Determination of Economical Raw Material Purchase

Here, it will be tried to apply the EOQ method to the policy of supplying raw materials to light steel companies in Way Jepara during 2015. The calculation is using the EOQ method,

in addition to determining raw materials per period. Average purchase price per kilogram (table 1): The storage cost borne by the company is 10% of the purchase price per kilogram.

The formula used to calculate EOQ:

$$\sqrt{EOQ = (2PR) / I}$$

Optimal purchase quantity (EOQ) during 2015

Based on the data previously intended: it is known that the need for raw materials per year (R) :

(R) : 19.110

Continuous cost (P) : IDR 1,617,808

Storage costs (K) : 10%

Average purchase price of raw materials (U) :Rp. 3.925,00

$$EOQ = \frac{2(Rp.1.617.808)(19.110)}{(10\%)(Rp.3.925)}$$

$$= 3.623,250636$$

$$= 3.623 \text{ (rounded)}$$

Based on the results of the calculation using the EOQ method, it can be seen that the company should have purchased as much as the average purchase of raw materials by the company during 2023 as much as 1,617 (Appendix 1), while the number of economical purchases according to the calculation was 3,623. This shows that the average number of purchases made by the company is smaller than the number of economical purchases according to calculations. Factors Influencing Raw Material Purchasing

1. Material Costs: Prices of raw materials can fluctuate based on market demand and supply.
2. Lead Time: Time taken from placing an order to receiving materials affects inventory levels and production schedules.
3. Order Quantity: The amount purchased impacts both unit costs and storage needs.
4. Supplier Reliability: Consistency in quality and timely delivery are critical for uninterrupted production. (Rahardja, P. & Manurung, M. 2004)

Determination of Frequency and Interval of Raw Material Purchase

To get the most profitable frequency of raw materials, it can be done by dividing the needs of raw materials for one period with the purchase of optimal raw materials. Frequency Formula.

$$Fr = \frac{R}{EOQ}$$

As for finding out the interval between the time of a message and The other can be used formulas:

$$I = \frac{\text{Number of working days (N)}}{Fr}$$

Light steel companies set working days for 1 Week in 7 days for a year, i.e. 52 weeks x days = 364 days, and the reduction of days other holidays, the company sets working days every year, which is 352 working days.

Frequency (Fr) and Interval (I) of purchases during 2023

Based on the data mentioned earlier, it is known:

- Annual raw material needs (R) = 19.110
- Optimal purchase quantity (EOQ) = 3.623.2506

$$Fr = \frac{19.110}{3,623.2506 \text{ Kg}}$$

$$= 5,274 \text{ times} = 5 \text{ times (rounded)}$$

$$I = \frac{352}{5,274}$$

$$= 66.74 = 66 \text{ days (unlocked)}$$

The results of the calculation can be seen that the company should purchase raw materials 5 times during 2015 with a purchase interval of 66 days. The frequency of purchases made by a company is closely related to the number of purchases. A lot of what the company does will affect the amount of costs that the company bears. For this reason, companies need to pay attention to the frequency of orders so that order costs can be kept as low as possible

Establishing the right frequency and interval for raw material purchases is essential for maintaining optimal inventory levels and ensuring efficient production processes at CV. Nira Jaya Abadi. This analysis outlines the steps to determine the most effective purchasing schedule.

Factors Influencing Purchase Frequency and Interval

1. Demand Patterns: Understanding production requirements and customer demand fluctuations.
2. Lead Time: The time between placing an order and receiving materials affects purchase timing.
3. Stock Levels: Current inventory levels and reorder points impact how often materials need to be ordered.
4. Supplier Reliability: Dependability and consistency of suppliers influence ordering frequency. (Sigit, A. 2022)

Determination of Raw Material Safety Inventory

The procurement of safety supplies carried out by the company aims to avoid stopping the production process. Due to the absence or delay in the arrival of goods. To determine the amount of safety supplies that must be in the company, a deviation is used, namely actual storage with average usage. Based on the calculations shown in appendix 3, it can be seen that the amount of raw material storage standards in 2023 is 3,623.2506.

Considering that the raw material is durable and it takes a short time to obtain it, the light steel company sets the level of service provided by the long-term safety supply or safety factor at 10%, and uses two sides of the curve with a value of 1.28. Based on the safety inventory, it can be calculated using the formula for the magnitude of the deviation of the raw material concerned with the value of two curves, namely: The amount of raw material safety supplies in 2015 is $361.8837 \times 1.28 = 463.2211 = 463$ (but) One of the activities of light steel companies in order to maintain their survival is production activities. To be able to carry out production activities, raw materials are needed as one of the supports for the implementation of these production activities.

The implementation of raw material inventory by the company must be carried out as efficiently as possible. This is because the problem of raw material inventory can affect other parts of a company. From the calculation regarding the implementation of raw material inventory by light steel companies in Way Jepara, using the EOQ calculation method in 2023, it shows that the company has not organized an optimal inventory of raw materials. This can be seen from the results of the calculation of the average number of raw material purchases made by the company is 1,617 in 2023 while according to the calculation with the EOQ method, the

result for 2023 is 3,623 economical purchases. (Siahaan, M. 2019)

The average number of purchases that are smaller than the number of economically purchased purchases causes the frequency of purchases to be higher. The frequency of purchases made by the company in 2023 is 12 times while the frequency of purchases according to calculations is 5 times. The frequency of calculations that are higher than the calculation results in large ordering costs, and also results in the large inventory of final raw materials. This means that the company must bear the cost of raw material inventory, in addition to the risk of damage to the raw material. The cost of raw material inventory borne by the company in 2023 is IDR 19,440,670 while according to the calculation using the EOQ method is 17,065,510.5. (Lestari, R :2023)

CONCLUSION

Based on the discussion reviewed in the previous chapter, the author draws the following conclusions. Firstly, the company's total cost of raw material inventory exceeds the Economic Order Quantity (EOQ) calculation. This is primarily due to frequent raw material purchases. In 2023, the total raw material inventory issued amounted to Rp. 19,440,670, whereas the calculated EOQ was Rp. 17,065,510.5. Therefore, the hypothesis that the company incurs higher costs due to excessive raw material inventory is deemed acceptable.

Secondly, optimal purchasing calculations reveal that maintaining a minimum inventory of Rp. 17,065,510.5 is more cost-effective compared to the company's actual inventory costs without calculations. The high raw material costs stem from small purchase quantities, leading to frequent purchases and low raw material supplies. Thirdly, the analysis also identifies a 7-day lead time for raw material replenishment and determines the reorder point for raw materials. These conclusions highlight the benefits of using EOQ calculations to optimize raw material inventory management, reducing costs associated with excessive inventory levels and frequent purchases.

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