
ANALYSIS OF RAW MATERIAL INVENTORY CONTROL USING THE ECONOMIC ORDER QUANTITY (EOQ) METHOD, SAFETY STOCK (SS), AND REORDER POINT (ROP) ON THE PRODUCTION OF FOOTWEAR HARIS JAYA WEDORO SIDOARJO METHODS

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ABSTRACK

Haris Jaya Footwear Production is a business that produces sponge slippers located in the Sidoarjo region. In conducting its production activities it is closely related to the supply of raw materials which are important components that must be available for the smooth production process. The purpose of this study is to find out how to stock the raw material of footwear with the EOQ method efficiently, Know the optimal amount of safety stock, and be able to determine the point of re-ordering raw materials (ROP) so that the production process is not obstructed. The method used in this study is descriptive qualitative. The results showed that by applying the EOQ method, (1) the total cost of raw material inventory for Haris Jaya Footwear Production when calculated using the EOQ method was IDR 30,342,940, while the Haris Jaya Footwear Production policy was IDR 37,363,478. Cost savings when using the EOQ method is Rp 7,020,538 or can reduce costs by up to 18%. (2) The optimal amount of raw material for Eva sponges is 22 sheets. (3) And reorder when the Eva sponge raw material in the warehouse reaches 45 sheets.

Keywords: EOQ, Safety Stock (SS), and Reorder Point (ROP)

INTRODUCTION

Background in general, every company, both service companies and manufacturing companies, have the same goal, which is to make a profit. For manufacturing companies production is the most important because it has an influence on profits to be obtained by the company. In the production activities, the company always requires inventory. Without the availability, it will hamper the production process and the company cannot fulfill the wishes of the customers. This might be due to the absence of inventory at the time of the production process which results in the company losing the profit it should have obtained. Therefore, inventory has a very close relationship in the production process to produce quality products and get the benefits that the company wants.

. Haris Jaya Footwear Production was founded in 1990, one of the industries producing Sponge Footwear. The main raw material used in this production process is Eva Sponge. For the production process to run smoothly, the raw material must be available. The problem faced is that the industry has not determined the amount of raw materials that must be purchased in one period. In this case, it is known that the demand for raw materials carried out by Haris Jaya Footwear Production has fluctuated so that the right method is needed in determining the supply of raw materials to be used.

To achieve the efficiency of raw material inventory, it is necessary to have accurate frequency of purchase and quantity of raw materials. So that the production of Haris Jaya Footwear must calculate the amount of safety stock in order to avoid shortages of raw materials in the warehouse in order to avoid a shortage of inventory. In addition, Haris Jaya Footwear Production must also calculate the ROP in order to determine the right time to reorder to avoid accumulation warehouse inventory

Realizing the supply of raw materials has a very important role in the production process, especially in the Production of Haris Jaya Footwear. And researchers see there are still gaps to conduct research that is different from previous research in controlling the supply of raw material for sponge footwear with the production process, especially in the Production of Haris Jaya Footwear.

LITERATURE REVIEW

Safety Stock

According to Rangkuti (2004: 10) in his book explains that the concept of safety stock (safety stock) is an additional inventory held to protect or maintain the possibility of a shortage of material or stock out.

The Purpose of Safety Stock

The purpose of safety stock is to minimize the occurrence of stock out and reduce the addition of storage costs and total stock out costs, storage costs here will increase along with the addition originating from the reorder point due to the safety stock. The advantage of a safety stock is that when there is a surge in demand, the safety stock can be used to close the request.

Economy Order Quantity (EOQ)

Understanding EOQ (Economic Order Quantity) according to Bambang Riyanto (2001: 78) is the quantity of goods that can be obtained with a minimal cost or often said to be the optimal number of purchases.

ROP (ReOrder Point)

According to Rangkuti (2004: 83) in his book explains that the understanding of reorder points (ROP) is an inventory operation strategy is a ordering point that must be done by a company in connection with the Lead Time and Safety Stock. Meanwhile according to Heizer and Render which states that the reoder point is when (point) inventory where action needs to be taken to fill the shortage of inventory on the goods.

Previous Research

Maulana & Rois (2018) in their research entitled "Analysis of Raw Material Inventory Control Using the Economic Order Quantity (EOQ) Method in an Effort to Minimize Production Costs at CV. Eight-Eight Brass "shows that (1) CV. Eight-Eight has not optimally carried out inventory control to minimize costs economically; (2) By using the EOQ Method, companies can save the total cost of tapioca flour and wheat flour raw materials respectively Rp.17,553,366, and Rp.11,109,966, - (3) Optimal raw materials for the amount of tapioca flour and flour on the CV. Eight-Eight is 1,441 kg and 1,177 kg, total safety stock of tapioca flour and wheat flour is 1,026 kg and 703 kg, and (4) The company must re-order when the amount of raw tapioca flour and wheat flour in the warehouse reaches the amount of 1,199 kg and 811 kg.

METHODS

Research Approach

In this study using a Qualitative Descriptive Method. Qualitative research methods are subjective from the participant's perspective descriptively so the results cannot be generalized. In other words, this research method is more about giving a clear picture of a problem in accordance with the facts in the field.

Object of research

In this research, the object of research is the Production of Haris Jaya Footwear. Located in Wedoro Sukun Gang Anggrek RT 03 RW 03 No.59, Waru, Sidoarjo.

Data source

The data source used is primary data where researchers directly conduct research on Haris Jaya Footwear Production. Primary Data is data obtained directly from research subjects by using measurement tools or data collection tools directly on the subject as a source of information sought.

Data collection technique

1. Interview Techniques,

Interviews are the activities of two people to exchange ideas by recording the information needed. Interviews are used as data collection techniques if the researcher wants to conduct a preliminary study to find problems that must be examined, and also if the researcher wants to know things from the respondents in more depth and the number of respondents is small / small.

2. Observation / Observation Techniques

Observation is a complex process, a process that is composed of various biological and psychological processes. Two of the most important are the processes of observation and memory.

3. Documentation Techniques

The document is a record of events that have already passed. Information can also be obtained through facts stored in the form of letters, diaries, photo archives, meeting results, souvenirs, activity journals and etc.

Data Analysis Technique

Data analysis technique is a step to be able to conduct a study, because data analysis functions to infer the results of research. Qualitative data analysis is carried out if the data obtained is qualitative in the form of tangible collections of words and not a series of numbers and cannot be arranged in a classification structure. Data analysis techniques used by researchers as follows;

1. Data Reduction

Data reduction is a form of analysis that sharpens, classifies, directs, discards unnecessary, so that it can draw conclusions. The data reduction or transformation process continues after the fieldwork, until the final report is complete.

2. Triangulation

Triangulation is a technique for checking the validity of data. Triangulation can be done using different techniques, namely interviews, observations and documents. Triangulation is used to check the truth and reproduce data.

3. Draw Conclusions

Data collection activities can be carried out by starting to receive information or explanations, activities to record, arrange, possible configurations, causal flows, and propositions.

RESEARCH RESULTS AND DISCUSSION

Tabel 4.1
The Need for Raw Materials for Haris Jaya Footwear Production in 2019

No.	Month Of Purchase	Amount of EVA Sponges (sheet)	Amount of Fur Fabric (meter)	Amount of Kabulon (meter)	Amount of rubber (sheet)	Amount of Bisban (roll)	Amount of Glue Yellow (gallon)
1.	January	90	90	180	360	120	30
2.	February	70	70	150	320	90	20
3.	March	70	70	150	320	90	20
4.	April	80	80	160	350	100	25
5.	May	100	100	200	400	150	50
6.	June	100	100	200	400	150	50
Jumlah		510	510	1.040	2.150	700	195

Source: Haris Jaya Footwear Production Data, 2019

Tabel 4.7
Total Inventory Cost of Haris Jaya Footwear Production

Inventory costs per raw material				
No	Materials	[]	[]	Total TIC
1	EVA Sponges	Rp 4.950.000	Rp 1.291.660	Rp 6.241.660
2	Fur Fabric	Rp 4.950.000	Rp 1.291.660	Rp 6.241.660
3	Kabulon	Rp 4.931.035	Rp 1.296.561	Rp 6.227.596
4	Rubber	Rp 4.940.807	Rp 1.294.015	Rp 6.234.823
5	Bisban	Rp 4.935.897	Rp 1.295.307	Rp 6.231.204
6.	Glue Yellow	Rp 4.875.000	Rp 1.311.535	Rp 6.186.535
Jumlah (TIC)				Rp 37.363.478

Source: Haris Jaya Footwear Production Data, 2019

So the total inventory cost that must be borne by Haris Jaya Footwear Production is Rp.37,363,478.

Calculation of Economy Order Quantity (EOQ) Method

Tabel 4.10

Total Inventory Cost (TIC) Using the EOQ Method

Inventory costs per raw material				
No	Materials	[]	[]	Total TIC
1	EVA Sponges	Rp 2.534.638	Rp 2.522.536	Rp 5.057.174
2	Fur Fabric	Rp 2.534.638	Rp 2.522.536	Rp 5.057.174
3	Kabulon	Rp 2.530.973	Rp 2.526.058	Rp 5.057.031
4	Rubber	Rp 2.530.313	Rp 2.526.754	Rp 5.057.067
5	Bisban	Rp 2.532.895	Rp 2.524.188	Rp 5.057.083
6.	Glue Yellow	Rp 2.553.571	Rp 2.503.840	Rp 5.057.411
Jumlah (TIC)				Rp 30.342.940

Source: Haris Jaya Footwear Production Data, 2019

So the total inventory cost that must be borne by Haris Jaya Footwear Production is Rp. 30,342,940

Safety Stock Calculation

Tabel 4.17

Safety Stock Calculation

Materials	Standar Deviasi	Safety Stock
EVA Sponges	12,5 sheet	22 sheet
Fur Fabric	12,5 meter	22 meter
Kabulon	21,3 meter	35 meter
Rubber	32,8 sheet	54 sheet
Bisban	25,5 roll	42 roll
Glue Yellow	12 gallon	22 gallon

Source: Haris Jaya Footwear Production Data, 2019

Determination of ReOrder Points (ROP)

Haris Jaya Footwear Production has a waiting time in waiting for raw material orders is for 7 days, or can be called 7 days lead time (L). And with the number of employees working for 150 days in 6 months. Determination of reorder points (ROP) can be seen in table 4.18 below as follows;

Tabel 4.18

Determination of ReOrder Points (ROP)

Materials	Determination of ReOrder Points (ROP)
EVA Sponges	45 sheet
Fur Fabric	45 meter
Kabulon	83 meter
Rubber	154 sheet
Bisban	74 roll
Glue Yellow	29 gallon

Source: Haris Jaya Footwear Production Data, 2019

CONCLUSION

From the results of the research and discussion in the previous chapter, a conclusion can be drawn as follows;

1. The total inventory cost of Haris Jaya Footwear Production raw materials when calculated using the EOQ method is Rp. 30,342,940, while the Haris Jaya Footwear Production policy is Rp. 37,363,478. Cost savings when using the EOQ method is Rp. 7,020,538 or can reduce costs by up to 18%.
2. Haris Jaya Footwear Production has not determined the existence of safety stock or Safety Stock (SS), whereas in the EOQ method, Haris Jaya Footwear Production must hold a safety inventory to facilitate the production process with the number of six raw materials as follows; 1). Eva response 22 sheets; 2). 22 meter feather fabric; 3). 35 meters high; 4). 54 sheets of rubber; 5). Bisban 42 roll and 21 gallon Glue.
3. There is a reorder point (ROP) in the EOQ method to anticipate delays in the delivery of raw materials. According to the EOQ method, Haris Jaya Footwear Production must reorder raw materials when the supply of six raw materials is at the level of the amount as follows; 1). Eva response 45 sheets; 2). 45 meter feather fabric; 3). The 83-meter ring; 4). 154 sheets of rubber; 5). 74 roll Bisban and 29 gallon Glue.

SUGGESTION

Based on the conclusions above, it can be used as consideration for reviewing raw material inventory policy. By applying the EOQ method can reduce the total cost of inventory more efficiently, the existence of a safety inventory in accordance with the amount produced if using the EOQ method, to anticipate raw material shortages so that the production process is not hampered, and determine the reorder point (ROP) to avoid delays in ordering raw material.

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