Research:

ANALYSIS CONTROL SUPPLIES RAW MATERIALS TO EFFICIENCY COST, USING THE METHOD OF ECONOMIC QUANTITY ORDER AT CV. PQR

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Abstract. *The purpose of the implementation of this research is to find the effectiveness of supplies raw materials, the method of analysis data used in the square is the smallest trend for planning raw materials and controling supplies use method of economic order quantity (EOQ) analyze reorder point. Analysis reorder point and safety stock. And analyzes efficiency cost of raw materials. Forecasting raw materials years 20x7 according to the smallest trend, cloth and dakron happened the difference is greater than of the target needed (according to a company); controling supplies raw materials with the methods eoq in 20x7 more effective than reservations raw materials cloth and dakron and more efficient than cost raw materials. The company should review the policy of forecasting raw material supplies that had been undertaken and make planning supplies the raw material that more accurate using the firm's historical data and not only targeting the output production next year, so that machines production can be optimized. Considering the use of control supplies with the methods economic order quantity to companies, so this analysis can determine material reservations, supplies safety, maximum supplies to avoid the risk of running out of raw materials, because the companies often happened less dressed up a result of reservations that time is inaccurate, the lack of safety stock and the deferred the delivery of goods which often disturb the production process, by this method can prevent these things, so that the production process can run smoothly and minimize the cost of raw materials supplies.*

Keywords: control, efficiency and cost of raw materials.

INTRODUCTION

Supplies is one of crucial factors for manufacturing companies, because they have of considerable value and have the effect on operation costs . the mistake in determining the number of supplies would have a loss for the company. If the amount of supplies too large so can result in the emergence of the cost of supplies or storage charges that high that will reduce profit. But if supplies too little effect the risk of shortage of supplies that can cause loss of production process, the delay of profit or perhaps even resulted loss of customers.

Supervision supplies is very important thing, because the number of supplies will determine or influence on the production process effectiveness and efficiency the company. The number of needs level supplies each company depend on volume of production, kind of factories and the process.

Basically the company do controlling raw materials with the ultimate aim was pressing the cost and optimizing profit at a particular time. In planning and controling raw materials have to exactly and good until production activities do not disturb and needs investments excessive, then should be counted how much commodities that will be acquired in accounting certain period, how many quantities of material which would be bought each doing purchase, and how the minimum and maximum quantity of required in a stock safety (safety stock), so that the company avoid from production stuck, due to supply the material delay, or excess of cost resulted supplies excessive.

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To control unwanted things as deficiency materia, or minimize fee to be used analysis economic order quantity (EOQ), which is a volume or the number of analysis the most economical to be carried on every material purchase.

LITERATURE REVIEW

The term of supplies (inventory) according to Handoko (200; 333) is: a general term to show everything or resource of organization that kept in demand anticipation. Herjanto (2003; 273) said understanding supplies as following: Supplies are materials or goods that is saved to be used to certain goal for example used in production process or assembly, for resale or spare parts of an apparatus or machine. Carter and Usri (2009; 6) said that understanding control: is as follows~

"Controling is a systematic management to accomplish purpose. According to Supriono (1992; 400) controlling is: Supervision is a function of coordination in organization continuous refined to lay responsibility for processing material and supplies in general , and menyelengarakan a an internal control for the basic document bookkeeping are support validity of a deal that deals with the covering supervision physical and supervision the value (the rupiah material).

Understanding control according to Earl p. In Malayu's book "Strong" (2007; 241) is: "*Controlling is the process of regulating the various factor in an anterprise according to the requirement of its plans*, It means control is the process of the regulation of diverse a factor in a company, that the implementation of in accordance with statutes in the plan. According to Harold Koontz in the Malayu (2007; 241) diverse ways understanding control:

"*Controlis the measurement and correction of the performance of subordinates in order to make sure that enterprise objectives and the plans devised to attain then are accomplished.* It means control is measurement and for improvements regarding the work subordinate, that plans who has been made for the company goals can take care. Controlling the raw materials that held an enterprise, of course made to be able to support activities which is in the company who wrote it. Integration of all the implementation of the activities in the company will support the creation of control the raw materials that well in an enterprise.

According to Carter and Usri (2009; 299) Controling of raw materials must meet two contrary necessity namely: 1. Keeping supplies in number and suffice to efficient. 2 .Keeping the supply financially rewarding. The basic objective control of raw materials is ability to perform order at the appropriate time with the best to obtain an exact number of prices and quallity proper.

According to Carter and Usry (2009; 299) an effective control should: provides a supply of raw materials needed to efficient and undisturbed, take adequate supplies in the period during which small suppliers (seasonal, cycle, or strike) and anticipate price change, storing raw materials with time handling and the minimum and protect the raw materials from losing fire, theft, weather, and damage handling cost, minimize item-item an inactive, excess, or obsolete reported products with changes that affects raw materials, make sure the stock enough to immediate delivery to customers and keep its invested capital consistent with operational needs and management.

Costs Supplies

According to PSAK (2008; 14.4) as for costs supplies: the cost of supplies should include all the cost of purchases, the cost of conversion, and other costs arising until supplies being in a condition and the current location. The costs supplies can be being inducted into several species of them:

1 . Storage charges holding cost of the cost of supplies consists of expenses varied directly with quantity supplies. Storage charges periode would increase if the quantity of material ordered the more, or an average supplies the higher. Expenses included in storage charges is: costs storage facility (including lighting, heating and cooling), the cost of keusangan, the cost of the calculation of physical and conciliation report, of insurance costs supplies, the cost of tax supplies, the cost of theft, destruction, or robbery and the cost of safety supplies.

2. The cost of reserving (a purchase) every time goods ordered, company incur the cost of reservations, costs reservations in detail includes: processing order and the cost of expedition., wages, the cost of telephone, sacking correspondece, packaging costs and weighing, the inspection cost revenue, cost to the warehouse and so on.Normally, the cost of order (out a

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charge of and pieces of a quantity) not go up if order grew. But tracing many components ordered every time a message, the number of order periode down, the cost of order total would down. This means the cost of order total perperiode annual is equal to the amount of orders done any period of multiplied cost to be issued every message.

3. The cost of the preparation of (manufacturing). When materials was not bought but produced in own company, so company facing the cost of the preparation of (setup cost to produce component of certain). These charges consist of: the cost idle machines, the cost of preparation labor directly, the cost of scheduling, the cost of expedition, and so on, such as the reservations cost of the preparation of the total preod is equals cost the preparation of priod. Because the concept of the cost of this analogous to the cost of reservations, so next use the term, the cost of reservations, which can understand each other.

4. The cost of run out or less dressed up of all expenses related to the level of supplies, the cost less dressed up shortage cost of is the most difficult to it is estimated that. The cost of this arising when supplies insufficient the request material. Expenses including the costs less dressed up is as follows: loss of the seller, lost subscriptions, the cost of reservations special, the cost of expedition, the difference between the price, disruption of operation and additional expenditure managerial, and so on .

Carter and Usri (2009; 6) said that understanding control is as follows: control is a systematic management to an end. According to Supriono (1992; 400) have control is: supervision is a function the coordinated in organization continuous refined to lay responsibility for processing material and supplies in general, and take care of an internal control for basic document bookkeeping are support validity of a deal that deals with covering supervision physical and supervision the value of (the rupiah material).

Understanding control according to Earl P. Strong in the malayu (2007; 241) is: controlling is the process of regulating various factor in an enterprise according to the requirement of its plans, it means control is the process of the regulation of diverse a factor in a company, that the implementation of in accordance with statutes in the plan.

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Control the raw materials that held in an enterprise, of course made to be able to support activities which is in the company who wrote it.Integration of all the implementation of the activities in the company will support the creation of control the raw materials that well in a enterprise. According to Carter and Usri (2009; 299) the control raw materials must meet two needs that opposable:
a. Keep supplies number and a variation that sufficient for efficiently.
b. Keep the level of financially rewarding.

Costs Supplies

According to PSAK (2008; 14.4) as for costs supplies: the cost of supplies should include all the cost of purchases, the cost of conversion, and other costs arising until supplies being in a condition and the current location .
Costs supplies can be classified into several: type of them:
a. Storage charges (holding cost).
   The cost of supplies consists of expenses varied directly with quantity supplies. Expenses included in storage charges is: costs storage facility (including lighting, heating and cooling), the cost of obsolescence, the cost of the calculation of physical and conciliation report, insurance costs supplies, the cost of tax supplies the cost of theft, destruction, or robbery the cost of safety supplies.
b. The cost of reserving (a purchase)
   Every time goods ordered, company incur the cost of reservations, costs reservations in detail includes: processing order and the cost of expedition, wages, the cost of telephone,

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expenditure correspondence, packaging costs and weighing, the inspection cost revenue. The cost of the warehouse and so on

Normally, the cost of order (out a charge of and pieces of a quantity) not go up if order grew. But tracing many components ordered every order, the number order of period down, the cost of order total would be down. This means the cost of order total period annual is equal to the amount of orders done any period of multiplied cost to be issued every order.

c. The cost of the preparation of (manufacturing when materials was not bought but produced in own company, so company face the cost of preparation of (setups cost) to produce component of certain. These charges consist of: the cost idle machines, the cost of preparation labor directly, the cost of scheduling, the cost of expedition, and so on.

d. The cost of run out or less dressed up.

  1. All expenses related to the level of supplies, the cost less dressed up (shortage cost) is the most difficult to estimate that. This cost is arising when insufficient supplies for material request. Including expenses the costs less dressed up is as follows: loss of the seller, lost subscriptions, the cost of special reservations, the cost of expedition, the difference between the price , disruption of operation, additional expenditure managerial, and so on.

  2. The cost less dressed up is difficult to measure in practice, especially because the fact that the cost of this often opportunity cost, which is very difficult as objectively.

RESEARCH METHOD

The analysis of forecasting needs of raw materials in the study the researcher using the method of the smallest squares trend, aim to predict the needs of materials in the following years this technique adapts to the trend line is a series of historical data points of a company and then projected forecast period to come. As for the equation of a line liniernya according to John Greenwood (2000; 277) is:

$$Y = a + Bx$$

$$a = \frac{\sum y}{n}$$

$$b = \frac{\sum xy}{\sum x^2}$$

Where:
Y = needs raw materials.
A = constant.
B = the number of time for a unit of time.
X = unit time.
N = the number of years.

Needs to know relations indeed raw materials to sortilege needs raw materials used analysis correlation or analysis of deception.

Analysis control supplies raw materials
1. Analysis of economic order quantity (eoq) for determining the amount of order or purchase optimal every time reservations need to computation quantity the purchase optimal economically or economic order quantity (eoq). As for steps consideration according to Carter and Usry (2006; 292) is as follows:

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$$EOQ = \sqrt{\frac{2 x RU x CO}{CU x CC}}$$

Where:
EOQ = the number of purchase optimal economically.
Co = the cost of reservations perpesan.
Ru = the use / demand it is estimated that perperiode time.
Cu = the price of raw.
Cc = prosentase storage charges.

To count prosentase storage charges according to Herjanto (2003; 231):
Prosentase storage charges = storage charges x 100 %

Model eoq above be applied if the following view is satisfied:
1. Demand of the product is constant, uniform and known.
2. The price perunit constant products.
3. Storage charges per unit per year is constant.
4. The cost of reservation order is constant.
5. The time between order done and goods received are constant.
6. There is no deficiency materials or back orders.

Deviation of opinion, may be reckoned using formulas EOQ another. While frequency reservations formulated:

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

Where:
I = frequency reservations.
R = the number of the raw material used. .
Eoq = the number of order optimal economically.

2. Analysis of safety stock.
Supplies safety can be determined based on prosentase of needed during the time of grace, it depends on company experience deeply time delay goods ordered or often the change of production. Supplies safety can formulated:

$$SS = Z\sigma$$

Where
ss = safety supplies (safety stock).
σ = standard deviations.

Herjanto (2003; 243) see that the service 95 % determine the magnitude of z. By using table the normal distribution, value z in the area under a curve normal 95 % (1- 0.05) can be obtained namely 1.65. The formula standard devisiasi

$$SD = \sqrt{\frac{\sum (X - Y)^2}{n}}$$

Where:
Primary = devisiasi standards.
X = discharging indeed.

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Y = forecasting / estimates use.
N = the number of (of all of the data).

3. Analysis reorder points.
Reorder points can be seen by setting for lead the time and coupled with use of during a particular safety stock Herjanto using formula (2003; 242):

ROP = SS + (L x d)

Where:
ROP = point reserving repeated (reorder points).
D = level per unit needs time.
L = lead time (reserving) time.
SS = safety supplies (safety stock).

4. Maximum Inventory
Maximum Inventory (maximum inventory) is the most massive inventories or high quantity that are supposed to be held by the company. Can be formulated:

Maximum inventory = Safety stock + Economic order quantity

RESULTS AND DISCUSSION

Products in generate CV. PQR of toys stuffed with size and forms that fariative .Raw materials used the form of cloth as velboa and cotton silicon or called also dakron. Buy raw materials years 20x6 done with the frequency of the 16 times reservations. The fabric bought with size per yards which is about 91,49 cm. While for cotton bought to quantity per kilogram. As for data needs raw materials for six years final can be seen in the table below:

Tabel 1.
The Needs of Raw Materials (20X1-20X6)

Year	Cloth	Dakron
20X1	316.800	237.600
20X2	403.200	302.400
20X3	777.680	583.260
20X4	1.008.430	756.322
20X5	892.840	669.630
20X6	823.710	617.782

Source: CV. PQR (Darmadi)

1. Forecasting supplies raw materials for this CV. PQR not doing forecasting supplies material, but the company only aimed output production for next year the rising or plus, 20 % from the previous year, so that can affect the increase in supplies for next year of about 20 % also. For that needs vahan raw years 20x7 can be counted 823.710 + (20 % x 823.710) = 988.452 yards cain and to dakron of 617.782 + (20 % x 617.782) = 741.338 kg .If calculated using analysis trend squared smallest (Handoko, 273; 2000) will they reached the estimation of years of 1.127.198 20x7 yards cain and for cotton as much as 854.398 kg dakron. Compared to be acquired the difference 138.746 yards cloth and 104.060 kg dakron.

2. Control of raw materials control supplies raw materials that have been company did by means of estimate supplies raw materials in warehouse be discharged in four days production, then the companies have reservations back to the number of estimated 25 days multiplied estimates the use of a day. So frequent less dressed up, dikarnakan delay delivery, or increasing production. It is also affected scarcity will raw materials cloth velboa dikarnakan rare

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textile industry producing this fabric, because this fabric rarely used. If this had happened, will be closed by borrowing material from subsidiaries still have a lot of raw materials and will be restored when it comes raw materials ordered. To avoid the objects, companies should determine safety supplies and reorder point also will avoid objects the production process will not be affected.

From scratch use formula above showed that the company in the 20x7 have to buy material with the frequency of the 14 times for the purchase cloth and 10 times as for the purchase dakron in one year. Buy back material done at the time when the rest of supplies of 13.708 yards cloth and to dakron of 10.281 kg. Thus when raw materials received with lead time 2 days, supplies remaining at warehouse 7.446 yards cain and dakron of 5.584 kg. To avoid excess supplies raw materials, the number of of done of 82.536 yards cain and dakron of 81.949 kg. That does not exceed maximum inventori of 89.872 yards cloth and to dakron of 87.533 kg.

Total cost issued company to a use eoq with the frequency of the reservations 14 times to the fabric Rp 57,305,300,00. According to company with the frequency of the reservations 16 times Rp 58.825.500,00. Total a charge of dakron according to eoq with the frequency of the reservations 10 times Rp 71.104.300,00, according to company with the frequency of the reservations 16 times total cost issued Rp 79.280.000,00. For more details can be seen in the table below:

Tabel 2
Comparisons Calculation Company Costs By Calculation Using EOQ

Information	Cloth (Rp)			Dakron (Rp)		
	Company	EOQ	Difference	Company	EOQ	Difference
Booking Frequency	16 x	14 x	2 x	16 x	10 x	6 x
Sorage Cost	25.225.519	27.905.278	(3,529.602)	23.280.000	36.104.306	12.824.306
Storage Cost	33.600.000	29.400.000	4.200.000	56.000.000	35.000.000	21.000.000
Total	58.825.519	57.305.287	774.713	79.280.000	71.104.306	8.175.694

Source : CV. PQR (Darmadi).

Raw materials cloth happened the cost savings on the Rp 774.713,00. And raw materials dakron happened the cost savings on the Rp 8,175,694,00. Thus policy control supplies with the methods eoq can be considered for use by the company, although the difference thrift total cost issued for raw materials small cloth, but for the dakron happened the cost savings on the large enough. Companies should review policy forecasting supplies raw materials that had been undertaken and planned supplies the raw materials that more accurate using data historical firm and not only is targeting output production to next year, so that machines efforts to production.

Need to use supplies pempertimbangkan control with the economic order to the quantity, because analysis it can determine the time reservations reuse materials, supplies safety, maximum supplies to avoid the risk of raw materials, as currently companies often there are scarce of a result of the reservations a bad, and the absence of safety stock and the delivery of goods often disrupt production process, with this method to prevent the objects, so production process can run smoothly and to minimize supplies raw material costs.

CONCLUSION

Based on the results of the outline done by the writer it can be taken conclusion as follows: forecasting raw materials years 2017 according to trend smallest square, needs the fabric and dakron happened the difference is greater than of the target need (according to a company); control supplies raw materials with the methods EOQ in the 2017 more effective against reservations raw materials cloth and materials dakron and more efficient against cost of raw

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materials CV. PQR. Companies should review policy forecasting supplies raw materials that had been undertaken and planned supplies the raw materials that more accurate using data historical firm and not only is targeting output production to next year, so that machines efforts to production and consider the use of control supplies with the methods economic order quantity to companies.

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