Inventory Control Analysis of Raw Material for Making the Men's Formal Trousers at PT. Dirgayusa Apparelindo

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Abstract. Inventory has an important role in a business operation, the company is required to do proactive management that able to anticipate problems and challenges in inventory management. Through optimal inventory control, companies can reduce inventory costs so the company goals can be achieved. This study aims to determine the control of raw materials applied by PT. Dirgayusa Apparelindo. This research is a descriptive study with a qualitative approach. Data collection in this study was carried out in the natural setting, primary data through observation, interviews, and documentation. Data validity and reliability were tested using triangulation techniques. The results showed that company in carrying out inventory control is still not optimal, especially in efforts to reduce the ordering cost, the risk of storage in warehouse, and in determining the amount of inventory. The company also has not applied any ordering decision techniques, so it is recommended to use the MRP method.

Keywords: Raw materials · Material requirement planning · Inventory control · Inventory

1 Introduction

The Indonesian Ministry of Industry has set a growth target for the non-oil and gas industry in 2018 by 5.67 percent. The target is increased by 0.83 percent from 2017 where the non-oil and gas processing industry only grew by 4.84 percent. The Minister of Industry said that various potentials and opportunities to accelerate industrial growth need to be utilized optimally, so that Indonesia can achieve a high quality and sustainable economic growth [1]

So in this case, we need a policy that must be considered by the company, which is a policy in implementing production planning and control activities. The unavailability of raw materials for the production process is one of the things that can cause a production system not run properly, therefore the company is required to do proactive management that is able to anticipate problems and challenges that exist in inventory management. How ever, the creation and storage of inventory is a cost, and to achieve high levels of efficiency the cost of inventory should be kept as low as possible. [2]

Every company must be able to make decisions about the procurement of raw material inventory at the company. Determination of the amount of investment in inventory that is not right will reduce company profits. If the raw material inventory is too large compared to the company's requirements it will effect to prepare also a large

enough fund to purchase materials, that means the fund tied up in the investment of raw material is becoming greater. Vice versa, if the supply of raw materials is too small, and can not meet the needs of the company for the production process it will result the frequency of raw material purchase will become greater. [3]

PT. Dirgayusa Apparelindo is one of the companies in the manufacturing industry, products produced by PT. Dirgayusa Apparelindo is men's trousers that produced by order. Procurement of raw materials at PT. Dirgayusa Apparelindo is determined by the number of orders. Based on the order received, the company calculates the amount of raw materials needed to fulfill the production process.

The company will determines and schedules the arrival time of raw materials to subsequently enter the production process. However, in reality there are often delays in the arrival of raw materials that hamper the production process, because the unavailability of raw materials, which is concern by researchers is the delay in arrival of raw materials that occurred in March, April and July 2018 delays that delayed in very long that is 21 days and 20 days.

Delay in the arrival of this raw material will certainly have an impact on product completion that is not in accordance with the schedule planned by the company, and it is feared that it will make consumers dissatisfied because the product is not finished at the specified time. Inventory management entails more than simply the forecasting and replenishment of inventory; it also demands the management of inventory to optimize services and profits. [4] The main issue of this research is there is a delay in the arrival of raw materials so that it interferes the production process caused by the unavailability of raw materials needed to carry out in production process activities due to lack of inventory control.

2 Literature Review

2.1 Inventory

Inventory is one of the factors of production that influences the smooth production process. The availability of raw materials will be closely related to the number of products to be produced. The definition of inventory according to Samanta, et al [5] is a physical stock of any items or resources used in organization. While the American Production Inventory Control Society Dictionary in Shenoy and Rosas [6] inventory is those stock or items used to support production (raw materials and work-in-process items), .. supporting activities (maintenance, repair, and operating supplies), and customer service (finished goods and spare parts). Furthermore Hansen and Mowen in Wauran, et al [7], said that inventory is all the money that organizations spends in turning materials. Inventory is both goods and resources used to support the production process. Inventory can be in the form of raw materials, work in process, supporting activities, and customer service in the form of finished goods. Inventory of raw materials is very important in a company, especially in manufacturing companies, because it can affect the production quality of a company.

The main purpose of the inventory is to ensure the availability of raw materials for the purposes of the production process. Meanwhile, according to Muller [8] the purpose of inventory is predictability, fluctuations in demand, unreliability of supply, price

protection, quantity discounts and lower ordering cost. Inventory must function effectively and efficiently in its implementation so that it can support the company in achieving its objectives. According to Sainadh and Sandhya [9] Inventory management helps the manager to take the appropriate decisions at minimum cost for a period of time. It creates a link between production and distribution departments. It fulfills the stock by recognizing the need of inventory at the right time.

While the inventory function according to [9] inventory management helps the manager to take the appropriate decisions among thestock and at minimum cost for a period of time. It creates a link between production and distribution department. It fulfils the stock by recognising the need of inventory at the right time, inventory function is used to optimize inventory levels to facilitate production and sales activities.

2.2 Inventory Control

Wild [10] said that inventory control is the activity that organises the availability of items to customers. It coordinates the purchasing, manufacturing and distribution functions to meet marketing needs. While Miller in Sainadh and Sandhya [9], Inventory control manages the shortage and accessibility of stock to secure the supply without excessive supply of inventory. Based on the understanding of inventory control above, it can be concluded that inventory control is an activity that regulates the availability of goods to customers. It also coordinates the purchasing function, production function and distribution function to meet market needs. Inventory control manages and secures the supply of inventory so as not to overdo it or shortage, and therefore it is necessary to balance and control inventory between purchases and production needs based on customer orders.

The purpose of inventory control in general is to determine and guarantee the availability of finished products, processed goods, components and raw materials in an optimal manner, in optimal quantity and optimal time. The objectives of inventory control according to Liu [11] is to control the existing inventory at a reasonable level to prevent unnecessary product from being added to the inventory, to determine purchasing cycle and order lead time, determine the batch and quantity of the orders, and to determine the supplier's on-time delivery rate, cooperation, and quality. Inventory control also estimates the fluctuations in raw material prices in the future, regulations the government concerning material inventory, the purchase price of raw materials, storage costs and the risk of storing it in warehouses and the rate of material being damaged.

2.3 Material Requirement Planning

Material Requirement Planning is a method which consists of a set of procedures, decision rules and a set of recording mechanisms designed to describe the master production schedule. The benefits of the Material Requirement Planning method are to provide better responses to orders, provide faster responses, and increase the use of facilities and labor, while also optimizing the amount of inventory. Material Requirement Planning according to Heizer, et al [12] is a dependent demand technique that uses a bill of materials, inventory, expected receipts, and a master production

schedule to determine material requirements. While Palanivel and Karkuzhali [13] Material Requirement Planning (MRP) is a logical, easily understandable approach to the problem of determining raw materials, assemblies, sub-assemblies and parts needed to manufacture an end product, it can be concluded that Material Requirement Planning is an information management system that can support production decisions. Material Requirement Planning is designed to regulate the planning of raw material requirements, elements and components that will be used in the production process.

Material Requirement Planning is compiled based on some information available to the company as the main input. According to Agrawal [14] The core data requirements for doing materials planning system are: (1) The Production Plan: It specifies the quantity of each finished unit of product to be produced and the time at which each unit will be needed. (2) The Bill of Materials: It specifies the sub-assemblies components and materials required for each finished goods. (3) The Inventory Records: It maintains details of items in hand for each subassemblies components and materials needed for each finished goods. (4) The Routing File: This file specifies the sequence of operations required to manufacture components, subassemblies and finished goods. The MRP system has three main steps that must be implemented, which is netting, is the process of calculating the net needs for each period during planning. Lotting, is the process of determining the quantity of orders to meet several periods of net need in one period at a time. Offseting, is the process of determining the time or period for an order so that the net needs for a period can be met.

3 Methodology

PT. Dirgayusa Apparelindo is one of the companies engaged in the manufacturing industry, products produced by PT. Dirgayusa Apparelindo is formal and casual men's trousers, can produce 46,800 pcs formal and casual men's trousers per month.

This research uses descriptive method with a qualitative approach. Because it uses qualitative methods, this research does not use population, but uses a "social situation" or social situation consisting of 3 elements, namely: places, actors, and activities that interact synergistically. This study uses a sampling technique that is non probability sampling with snowball sampling data collection techniques. Data sources or informants in this research are the Head of Production, Head of Marketing, Head of Purchasing, Head of Production Planning and Inventory Control, and Head of Warehouse Section at PT. Dirgayusa Apparelindo.

Data collection technique uses in this research is by directly observing the place where the research object is located in order to see the actual situation so that information is obtained directly from the research object. In this study the role of the document is as a complement so that the research results are increasingly credible. The author uses data collection with observation and interviews techniques. The documents used in this study are the company's official internal documents in the form of 2018 Period Fabric Arrival Report, 2018 Period Fabric Purchase Report, Production Planning and Implementation Schedule, Men's Formal Trousers Pants Order Period 2018.

The author uses data analysis techniques consisting of data reduction, data display, and conclusion drawing / verification. The process of testing the validity and reliability in this study, used a triangulation process. Triangulation is qualitative cross-validation.

It assesses the efficiency of the data according to the convergence of multiple data sources or multiple data collection procedures. The process of triangulation is a data validity test technique by utilizing something outside the data to confirm or compare it.

4 Results and Discussion

4.1 The Objectives of Raw Material Inventory Control in the Making of Men's Formal Trousers at PT. Dirgayusa Apparelindo

Maintain Production Continuity. In the implementation of the objectives of controlling the supply of raw materials for the production of men's formal trousers at PT. Dirgayusa Apparelindo that is maintaining the continuity of production does not experience problems, because in reality the activities of the production process at PT. Dirgayusa Apparelindo has never stopped. This study found that in maintaining the amount of raw material inventory of PT. Dirgayusa Apparelindo has effectively controlled the supply of raw materials for zipper, buttons, hard cloth, yarn and labels. However, the raw material for the type of plate fabric and the layer cloth is still not effective because sometimes in some periods of the production process there is still an excess of raw materials which causes an increase in inventory.

Efforts to Reduce Ordering Costs. In the implementation of the objectives of controlling the supply of raw materials for the manufacture of men's formal trousers at PT. Dirgayusa Apparelindo that is to reduce the cost of the message has not been fully compliant because in several production process periods the order is placed in a small quantity, causing an increase in the message charge rate for each unit of raw material ordered. In terms of ordering raw materials PT. Dirgayusa Apparelindo has no problems because of the quantity and quality of raw materials received by the company in accordance with those ordered and determined so that the company does not need to re-order which can increase the cost of ordering raw materials.

4.2 Inventory Factors of Raw Material Inventory Control in the Making of Men's Formal Trousers at PT. Dirgayusa Apparelindo

Amount Needed. In the implementation of the factors of raw material inventory making men's formal trousers at PT. Dirgayusa Apparelindo namely the amount needed by the company does not experience obstacles, because in every production process the company does not experience a shortage of raw materials. PT. Dirgayusa Apparelindo always calculates the amount of raw materials needed in a production process, so that PT. Dirgayusa Apparelindo can fulfill all the company's needs in carrying out production process activities. PT. Dirgayusa Apparelindo determines the calculation of the amount of raw material needs by multiplying the total product to be produced by each amount of raw material needed. PT. Dirgayusa Apparelindo is also given a tolerance of 20% for fabric raw material types and a tolerance of 10% for raw materials included in the accessories component of the quantity of each raw material that has

been calculated. The company's implementation in determining the amount needed is in accordance with what was planned beforehand.

Risk of Storage in Warehouse. In the implementation of the factors of raw material inventory making men's formal trousers at PT. Dirgayusa Apparelindo namely the risk of storage in warehouses is still not effective. PT. Dirgayusa Apparelindo carries out routine maintenance of the remaining inventory in the warehouse, but no efforts have been made to reduce the amount of inventory left in the warehouse.

4.3 Steps in Controlling Raw Material Inventory for Making Men's Formal Trousers at PT. Dirgayusa Apparelindo

Determine the Amount of Inventory At the implementation of steps to control the supply of raw materials for the manufacture of man's formal trousers at PT. Dirgayusa Apparelindo, namely the determination of the amount of raw material inventory included in the category of accessories, layer cloth, zipper, buttons, hard cloth, yarn and labels, has no problems, because basically these raw materials are raw materials that are widely available in the market so that raw materials are easy obtained and always arrive on time according to the needs of PT. Dirgayusa Apparelindo to carry out the production process. However, in determining the amount of inventory of raw materials, the type of plate fabric experienced several obstacles caused by the delay in arrival of raw materials. The unavailability of raw materials according to a predetermined schedule can hamper the company's production process so that the company's daily production target cannot be achieved to the maximum. So in reality what has been planned by the company does not go according to what the company planned due to the determination of the amount of inventory does not match what the company planned.

Establish Inventory Administration. In the implementation of steps to control the supply of raw materials for the manufacture of men's formal trousers at PT. Dirgayusa Apparelindo, which is to determine the administration of inventory that has been running according to what has been determined by the company. PT. Dirgayusa Apparelindo in determining the company's administration is quite effective, because the administrative flow is very clear and all data regarding raw materials has been well recorded.

4.4 Planning for the Production of Men's Formal Pants using the Material Requirement Planning Method

Planning for the production of men's formal trousers using the Material Requirement Planning method at PT. Dirgayusa Apparelindo stipulated that the master production schedule for 8 periods for November 2018 and December 2018 with a total production of 39,437 pcs divided into 9,860 pcs for each production period. Lotting technique used in the application of Material Requirement Planning at PT. Dirgayusa Apparelindo is a Lot for Lot technique, where the procurement of raw materials is done based on the needs of raw materials for each production period. The next Material Requirement

Planning table is prepared based on information on information about raw material inventory data, total net demand, lot sizing of raw material purchases, and lead time for raw material purchases.

5 Conclusion

The results showed that company in carrying out inventory control is still not optimal, especially in efforts to reduce the ordering cost, to reduce the risk of storage in warehouse, and in determining the amount of inventory. PT. Dirgayusa Apparelindo also has not applied any ordering decision techniques, so it is recommended to use the material requirements planning method so the company can plan production process activities more directed and can schedule the arrival of raw materials in accordance with the required raw materials. So that the risk of delay in the arrival of raw materials that can be reduced.

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