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Data Processing Analysis Using Material Requiremnt Planning (MRP) Method at PT. XYZ

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ABSTRACT: This journal discusses the application of material requirements management strategies in various manufacturing industries, based on material requirements planning (MRP) methodology. Manufacturing industries around the world are increasingly focused on increasing efficiency and reducing production costs. The key to achieving this goal is the implementation of management strategies in materials management, including planning, procurement, storage, inventory control, and efficient use of raw materials. This paper discusses the importance of MRP as an effective material management tool and outlines various approaches and strategies that have been applied in various manufacturing industries, including automotive, electronics, and pharmaceuticals. The result is increased productivity, reduced costs, and increased industrial competitiveness. This article provides an in-depth understanding of how using MRP to implement material requirements management strategies can enable manufacturers to respond quickly to changing market demands.

KEYWORDS: Manufacturing industry, Analysis, Production planning, Material requirements planning (MRP)

INTRODUCTION

In recent decades, the global manufacturing industry has experienced rapid development. In an increasingly competitive environment, manufacturing companies are under pressure to improve operational efficiency, reduce production costs, and remain competitive in an ever-changing global marketplace. One of the key aspects that supports the achievement of this goal is efficient material management. Engineering materials, including raw materials, components and finished goods, are important components in the production process, and their management has a significant impact on the productivity and profitability of the enterprise.

In order to achieve higher efficiency and optimize the use of materials, various manufacturing industries have sought solutions in the implementation of advanced management strategies. One method that has proven successful in managing material requirements is material requirements planning (MRP), a planning system that allows companies to better manage and control their material inventory while considering final product demand, changes in production plans, and availability of resources.

This article describes the application of material requirements management strategies in various manufacturing industries, focusing on the use of MRP methodology as a key tool; This article explains how MRP has helped manufacturing companies improve operational efficiency, reduce waste, and become more competitive in the global marketplace. Examples of how various industries, including automotive, electronics, and pharmaceuticals, have adopted MRP as a major component of their materials management strategies will be presented.

The purpose of this study is to find data that is relevant to the problems found, and the data obtained will be used as consideration in designing production data processing applications based on material requirements planning in the Company. The application of management strategies on material resources is the right and important topic to discuss, especially in the era of Industry 4.0 which requires companies to manage resources more intelligently. With a better understanding of the benefits and challenges of MRP, this article is expected to provide readers with valuable insights into how manufacturing companies are in an ever-changing environment. With a better understanding of the benefits and challenges of MRP, this article is expected to provide readers with valuable insights into how manufacturing companies can improve their efficiency and competitiveness in an ever-changing environment.

BASIC SYSTEM CONCEPTS

- **System definition**

In principle, all systems always consist of a number of elements:

1. Objects, such as components, elements, or variables. Depending on the nature of the system, objects can be physical, abstract, or both.
2. Attributes that determine the qualities and characteristics possessed by the system and its objects. Internal relations between objects in a system.
3. The environment, where the system is located.
4. A system is a collection of elements that interact to achieve a specific goal.

- **System Features**

Energy is an attempt to reduce the amount of energy required to use energy-related equipment and systems. Energy can also refer to systematic, planned, and integrated efforts to: Conserve domestic energy resources (energy diversification) Increase the efficiency of energy resource use.

- **General Model System**

The general model of this system is that it consists of inputs, processes, and outputs.

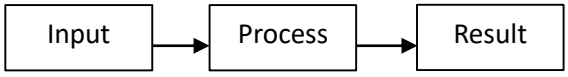


Figure. 1 General model of the system

- **Data System**

Data is a reality that describes real events and entities. Gordon B. Davis in his book, Management Information Systems (Conceptual Foundations, Structure, and Development), Gordon B. Davis calls data the raw material of information, as a group of non-random symbols that indicate quantity, behavior, etc.

- **Information systems**

Information is data that is processed into a form that is more useful and more meaningful to the recipient. Information as a management system, facts, data, or items that add knowledge to users.

- **Information System Definition**

An information system is a system in an organization that meets the needs of daily transaction processing, operational support, management, and strategic activities of an organization, as well as providing necessary reports to certain external parties.

- **Definisi Material Requirements Planning**

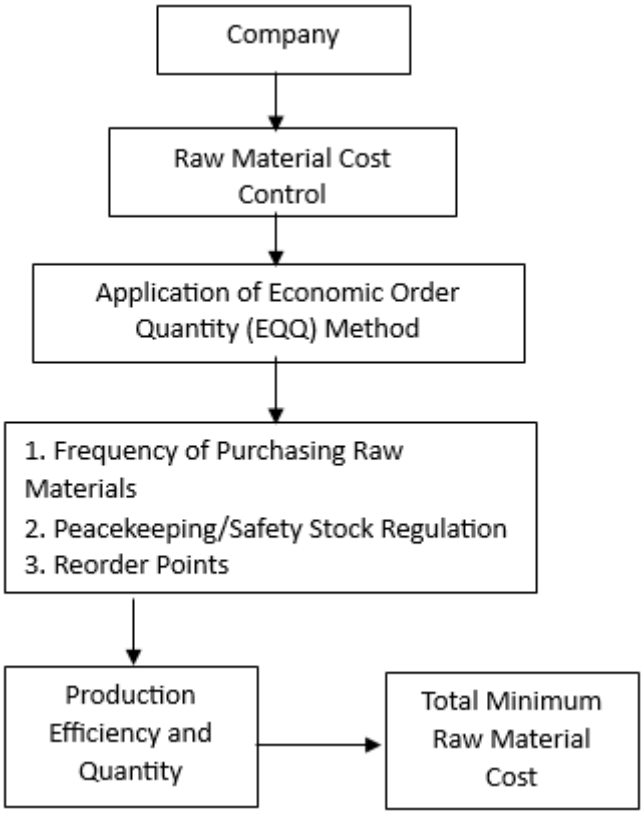
Material Requirements Planning (MRP) can be defined as a technique or set of systematic procedures for determining quantity and time in the process of planning and controlling items (components) that depend on higher level items (dependent demands). There are four main features of MRP systems:

1. Able to determine needs at the right time.
2. Set minimum requirements for each item.
3. Decided to execute the order plan.
4. It determines the rescheduling or cancellation of a pre-planned schedule. In the manufacturing industry, MRP is considered a manufacturing business management tool.

RESEARCH METHODS

The research method used in this study is descriptive quantitative research, starting with theory, followed by data, and ending with facts. The data used in the results of this study are quantitative and qualitative data. Quantitative data is quantifiable data, while qualitative data is data in the form of non-numerical descriptions.

Table 2. Planning Concept



Based on one concept that can be used to plan and manage raw materials well is to use a raw material needs planning system (MRP). MRP system is a system for planning and scheduling raw material requirements for production. (Rangkuti, 2007).

MRP can address complex problems that arise in inventory. Although MRP is more complex, it can have a direct impact on a company's finances, providing several benefits such as minimizing inventory, reducing the risk of production and delivery delays, increasing efficiency, and lowering cost levels as a result of MRP: main production schedule (MPS), bill of materials (BOM), and product configuration, inventory records; four main inputs are processed by the MRP system.In detail, inventory levels include ordering goods in the right quantity and time. On the other hand, the priority of work includes placing orders on the right due date.

System capabilities include workload planning for workers and machines, precise load planning, and precise timing planning for load forecasting. This allows the company to maintain a minimum level of raw material inventory while ensuring the fulfillment of the production schedule for the manufacture of products.The operational definition in the material inventory control plan is a system applied by management to control the company's internal material inventory with the aim of obtaining the most efficient total inventory costs.Research variables are attributes, properties, or values of people, things, or activities that are set by researchers to be studied and conclusions drawn. In this case, the research variable is the raw material inventory management plan.

Table 2. Variabel Method MRP

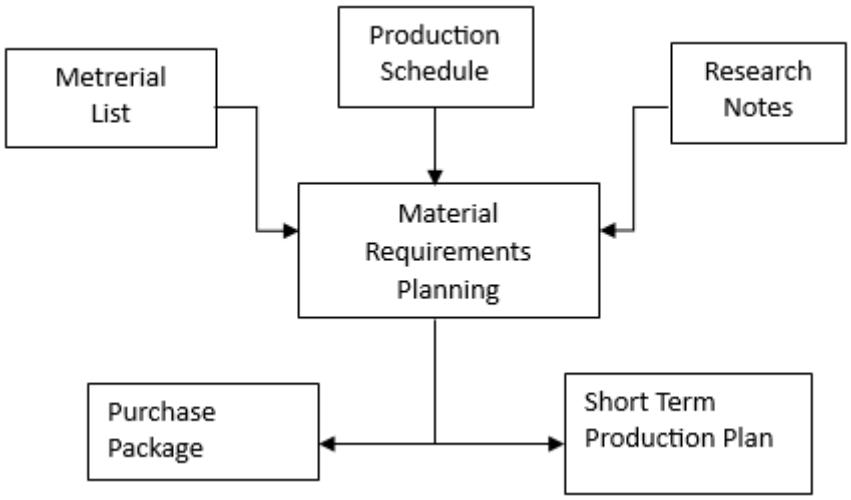
Variable	MRP Process	**Method**
Material Requirements Planning (MRP)	1. nets (hair, netballs, etc.) 2. Lot (order volume) 3. Offset (Order Plan) 4. Explosion (inventory cost)	1. Prepaid calculation using the POM-QM program For Windows version 3. - Index Enhancements - Least squares (method) 2. MRP calculation process: - Determination of Production Master Schedule (JIP) - Determining the need for raw materials for each period - Determination of the order amount (lot size) - Lot vs. Economical order quantity.

The system built must be able to present the data needed. Of course, there must be a clear link between the data available and the users who need it. In this way, the process.Data processing can be effective and efficient.The approach taken by this pt.xyz is used in supply chain management to plan and control the inventory of raw materials, components, and final product products.

This technique is also with the EOQ approach by determining the fixed order quantity by considering the cost of the message and the cost of storing material needs. Material needs will be ordered when the amount of available stock cannot meet the needs.

Production data is based on studies conducted in PT.xyz to address problems, especially those related to processing.

Table 3. System Material Requirement Planning (MRP)

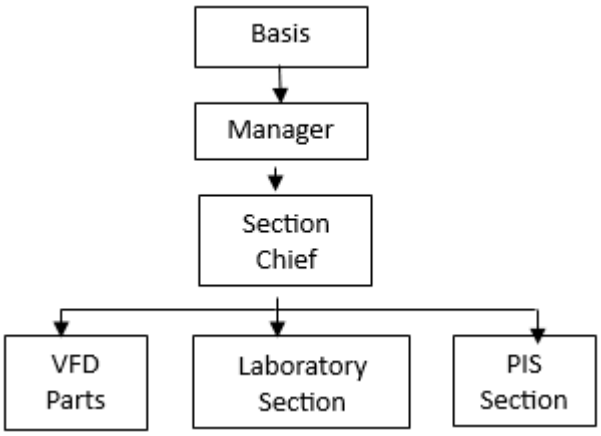


RESULTS AND DISCUSSION

Storage costs for further analysis are calculated in percentage form, that is, as a percentage of the amount of inventory. The amount of inventory is the amount of raw materials ordered per order, and the price of raw materials is a variable cost that depends on the amount of raw materials per order.

First, companies need to review and improve their raw material inventory policy systems to maximize profits. Second, companies need to determine the number of safety stocks, reorder points, and maximum inventory to avoid the risk of stockouts and excess raw materials, as well as minimize the company's raw material costs. Finally, companies must apply the EOQ method to their raw material management systems. This is because the application of the EOQ method has proven to be more efficient than the total cost of raw materials incurred by the company.

Table 4. Organizational structure PT.x



Based on the findings that have been described so far, it can be described the system and procedure of operating system analysis of data processing systems from production in PT.xyz.

CONCLUSION

MRP is a suitable method to apply to demand-dependent inventory management (Heizer, Render &; Munson, 2016). The amount of raw materials to be ordered can be given to the

Information Technology is one of the branches of science known today. This arises because of the development of human civilization which requires every individual to have competence in the field of technology informasi.PT.xyz is one of the companies engaged in processing to see from, which at first was just a business that worked to process property owned.

Community, especially from villages around the company that has many plantations, PT.

company as reference information for financial planning. This can increase the productivity of the company.

By connecting MRP to an integrated information system, changes in demand can be predicted. In addition, other inventory cost variables, such as stockouts and installation costs, can be added for more thorough inventory cost management. Advice can be given in hopes of helping improve the company in the future.

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