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A Study on Process of Material Requirement Planning Towards Weg Industries with Reference to Hosur

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Abstract: *Material requirements planning (MRP) a system is a prominent approach to manage the material flow and components on the factory floor. MRP technique- is used to explode bills of material, to calculate net material requirements and for production planning. The master production schedule and bill of materials indicates the materials to be demanded, order scheduling, cycle time production and supplier lead times then these all factors jointly determine when orders should be placed. It is a time phased priority-planning technique that calculates material requirements and schedules supply to meet demand across all products and parts in one or more plants and used to optimize the inventory. It controls the system that attempts to keep adequate inventory levels to assure that required materials are available when needed. The demand is forecasted for the materials based on actual demand and this gives the expected levels of goods or services. Based on the forecasted demand material requirement planning is done and orders are released to purchase materials and the materials are stocked. The objective of this work is to reduce the idle time and cost of materials and by procuring materials in right time.*

Keywords: *Material Requirement Planning, priority planning, Inventory, procuring*

1. INTRODUCTION

Material requirements planning (MRP) is a production planning, scheduling, and inventory control system used to manage manufacturing processes. Most MRP systems are software-based, but it is possible to conduct MRP by hand as well.

An MRP system is intended to simultaneously meet three objectives:
Ensure raw materials are available for production and products are available for delivery to customers.
Maintain the lowest possible material and product levels in store
Plan manufacturing activities, delivery schedules and purchasing activities.

Material requirements planning (MRP) is a system for calculating the materials and components needed to manufacture a product. It consists of three primary steps: taking inventory of the materials and components on hand, identifying which additional ones are needed and then scheduling their production or purchase. In the manufacturing industry, technological complexity is ever increasing. Products come out a few months ago would be outdated nowadays and be replaced by another newcomer. This process repeals itself indefinitely, but every time, the product life cycle shortens. With the advance of the knowledge. Technology is also easily and quickly replicated. What one achieves right now would be matched and even be surpassed later. Complacency should not appear even for a short while, in this industry. It is in this breath-holding background that I intend to explore how a typical manufacturer and supplier serves this industry &maintains its competence, or even outperforms other suppliers. Which specializes in designing, producing and selling a Wide variety of electronic components for the mega electronic equipment

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producers. A Research corporation has done a survey which found that customer from Corporation A were extremely dissatisfied. In fact, they have suffered two allocation events which they have adopted A's products into their design but received limited cargo. Some even received nothing and were forced to redesign their products to adapt other vendors' parts. A major customer once complained: Corporation A is the most inflexible, arbitrary and capricious vendor among my supplier list. Other vendors become cheaper, faster, more reliable and more flexible.

2. REVIEWS OF LITERATURE

Hairul Rizad Md Sapry et.al (2018) The deployment of MRP systems is essential to today's production process since it gives the business, as well as the marketing and manufacturing teams, useful information. However, the MRP system is not fully capable of doing all tasks. Regarding flexibility and adaptation to changes in the external environment, the MRP system has a few restrictions. The goal of the study is to determine whether the MRP system can accurately anticipate the amount of inventory needed. By the all journals the exponential smoothing is generally used to make short-term forecasts, but longer-term forecasts using this technique can be quite unreliable.

Dinesh E. D et.al (2018) Systems for managing material requirements planning (MRP) are widely used to control the flow of materials and parts on the production floor. Exploding bills of material, determining net material requirements, and production planning are all done using the MRP approach. Order scheduling, cycle time production, and supplier lead times are all aspects that together decide when orders should be placed. The master production schedule and bill of materials identify the materials Tobe needed. It is a time-phased priority-planning method used to optimize inventory that figures out the amount of material needed and plans supply to satisfy demand across all products and parts in one or more facilities. The benefit of Material Requirement Planning (MRP), which guarantees that materials are available in time for service and delivery to customers.

Karen Santin et.al (2018) the adoption of a technology for materials planning in the Brazil furniture business. The MRP method was employed (Material Requirements Planning). The work was created based on the process improvement identification, which includes: lower inventory costs, improved production efficiency, and more accurate information. The following outcomes were assessed following a five-month MRP run: In addition to these quantifiable benefits, client feedback revealed improvements in customer service. As supply agreements were reached and the gap between the company and its suppliers was closed, suppliers' delivery times also improved.

Hyoung-Gon Lee, et al (2019) proposed a grid enabled MRP process in a distributed database environment and demonstrates the performance improvement of the proposed process by a simulation study and divided into five parts. It begins with a review of the literature dealing with MRP and grid computing technology. The second part involves establishing MRP that leverages grid resources and accommodating the data management issue. The third part explains the experimental procedure and analytical results for different circumstances. The fourth discusses dealing with the implications of the data management issue, and finally the article concludes with several suggestions for future studies. Enterprise resource planning (ERP) software, are used in the production planning for manufacturing enterprises to ensure that appropriate quantities of raw materials and subassemblies are provided at the right time.

Karl Inderfurth, (2019) Traditional MRP systems suffer from several weaknesses, one of them being the disregard of uncertainties like those referring to demand and supply quantities. Advanced MRP concepts handle these uncertainties by incorporating safety stocks and scrap allowances into order release calculations. However, they fail to address how these measures of risk protection might interact. Here, it is shown by using analyses from stochastic inventory control, how the performance of MRP-generated control rules can be assessed and how appropriate control parameters for MRP can be determined.

Rahul Hencha et.al (2019) Since materials are the primary prerequisite for every finished product, material requirements planning (MRP) systems are widely employed across all industries. An essential component of production planning and control is determining lot sizes, lead times, scheduling in production locations, and the quantity of parts and their types that are available. Safety stock boosts overall company profit by decreasing inventory costs, shipping costs, packaging costs, and other expenses. By reviewing the appropriate shortage plan and determining the quantity of items that should be included in the next day collection plan in order to reduce the

amount of material not included in the plan.

Fitri Maya Puspita et.al (2019) Forecasting and Fixed Order Quantity Method in Optimizing the Inventory Policy of Raw Materials" Originating in Mining. Therefore, Material Requirement Planning (MRP) was used in conjunction with ARIMA forecasting and the Fixed Order Quantity (FOQ) method to predict the minimum inventory costs and Polygon branches. A company keeps a small amount of stock in order to use it properly when needed in the future while maintaining a steady flow of activities. In most situations, keeping the cost of storing raw materials or completed goods in stock will be the optimal inventory plan. The type of industry will determine which of these two models—a probabilistic or deterministic model of inventory control—to use.

Konstantin Kostic et.al (2019) This article demonstrates how to describe the fundamental problem of optimum control of the discrete system, which is to determine the ideal number of replenishments in the fixed-order quantity system. The time horizon is finite, and the decision environment is deterministic. The law of dynamics, the control domain, and the performance criterion make up a discrete system. Although it is primarily a simulation model of inventory dynamics, the performance criterion allows for a comparison of different order schemes. The influx and outflow rates have an impact on the dynamics of state variables.

Gabriella Regina et.al (2021) Clothing manufacturers frequently employ aggregate planning to maximize profits by determining the best balance between increasing sales and lowering production costs. This technique, however, is unable to adjust to the variable demand without a reliable demand forecast and careful production planning, leading to frequent product stock outs that raise the number of unfulfilled customer needs. Implementing Material Requirement Planning (MRP) is the suggested improvement strategy to address this issue. The study described in this article contributes to time series based modelling and demand forecasting in the food industry.

Sourabh Shastri et.al (2022) One of the most crucial processes in the knowledge discovery process, data mining is needed to draw out fascinating patterns from huge amounts of data. The percentage of live births that received the anti- tuberculosis vaccine Bacillus Chalmette Guerin (BCG) is used in this paper to forecast the BCG coverage percentage for the following five years based on historical yearly data for Coverage in India. We did this by using the exponential smoothing technique. A popular forecasting method known as exponential smoothing employs weighted values of past series observations to estimate the near future for time series data.

D Hebsiba Beula et.al (2023) The insurance sector is directly impacted by climate change risks, which include transitional risks, liability risks, and physical risks. The insurance industry is significantly being impacted by climate change, which includes things like summer heat waves and heavy rainfall (Flood). It has an impact on the reinsurance and insurance industries. When working with a little amount of land, farmers use hybrid variety plants, seeds, and other products to boost agricultural productivity.

3. RESEARCH METHODOLOGY

It refers to the process used to collect information and data for the purpose of making business decision. The methodology may include publication research, interview, surveys and other research techniques, and could include both present and historical information.

4. OBJECTIVES OF THE STUDY

Primary objective

A study on process of materials requirement planning towards Weg industries at Hosur

Secondary objectives

To establish the role of elementary scheduling system on material requirement planning in the automobile firm

To find out the role of inventory control system on material requirement planning in the industry.

To establish the role of capacity requirement planning on operational performance in manufacturing firms

To control inventory by ordering bought-in-components and raw materials in relation to the orders received or forecast rather than the more usual practice of ordering from stock-level indicators.

To find out the role of demand forecasting system on operational performance in the firms.

4. SCOPE OF THE STUDY

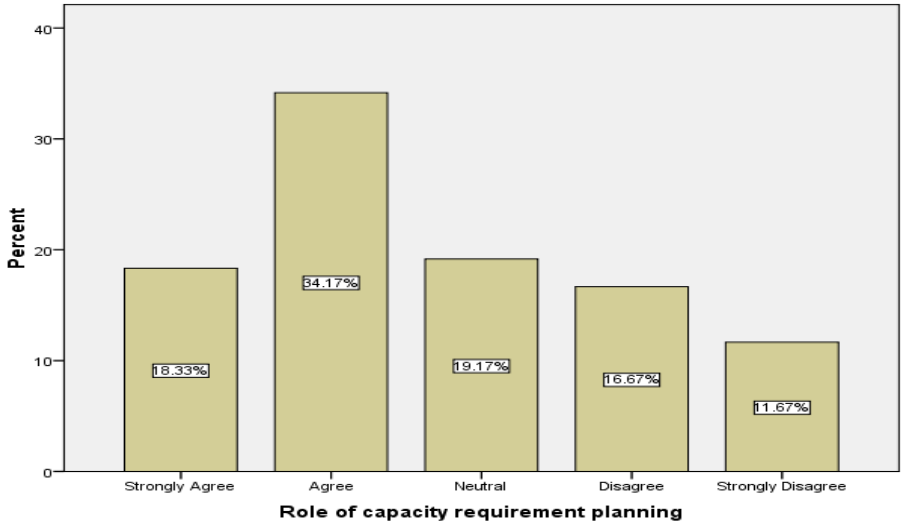
Most manufacturing industries irrespective of the products they produce face typically similar problems daily; which is that customers want products available at the shortest duration possible and in other to achieve this, planning is required. Industries needs to manage quantities and varieties of materials they procure, planning of product to be produced, quantities required and ensure present and future customer demand at optimum cost. Poor production planning leads to loss for the company.

5. DATA ANALYSIS

Simple percentage analysis

Role of capacity requirement planning

Role of capacity	No. Of respondents	Percentage
Strongly agree	22	18.3%
Agree	41	34.2%
Neutral	23	19.2%
Disagree	20	16.7%
Strongly disagree	14	11.7%
Total	**120**	**100.0%**



Chi-Square Tests

Educational Qualification * Important capabilities of MRP system

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	3.393E2[a]	16	.000
Likelihood Ratio	270.753	16	.000
Linear-by-Linear Association	109.845	1	.000
N of Valid Cases	120		
a. 18 cells (72.0%) have expected count less than 5. The minimum expected count is .58.			

6. FINDINGS

1. Mostly 35.0% of the respondents are age group 30-35 years.
2. Majority 60.8% of the respondents are married.
3. Mostly 43.3% of the respondents are qualified under graduate.
4. Mostly 35.8% of the respondents are working as field staff.
5. Mostly 38.3% of the respondents are earning for 20,000 - 30,000.
6. Mostly 44.2% of the respondents are experienced in 1-2 years.
7. Mostly 39.2% of respondents are agreeing for elementary scheduling system.
8. Mostly 33.3% of respondents are strongly agree for role of capacity requirement planning.

7. SUGGESTIONS

In this analysis we conclude that utilization of both the forecasting methods are useful for prediction of raw material by using this technique. We can reduce the wastage of raw material and reduce the cost of raw material and we can also have inventory control and we can also deliver the goods on time and satisfy the customer requirements and also improve the sales and profit of the company. We can also deliver the goods within the short periods. Compared to the other methods ARIMA forecasting and Exponential smoothing methods are more useful for prediction of raw material. The comparison between Autoregressive Integrated Moving Average (ARIMA) model and Exponential Smoothing Method in making a prediction. The comparison is focused on the ability of both methods in making the Forecasts with the different number of data sources and the different length of forecasting period. The ARIMA model can produce a better prediction for the long-term forecasting with limited data sources but cannot produce a better prediction for time series with a narrow range of one point to another as in the time series for Exchange Rates. On the contrary, Exponential Smoothing Method can produce a better forecasting for Exchange Rates that has a narrow range of one point to another for its time series, while it cannot produce a better prediction for a longer forecasting period.

8. CONCLUSION

This paper delivers the advantage of Material Requirement Planning (MRP) in ensuring materials on time for service and delivery to customer. Forecasted demand gives the input to MRP for the next purchase of materials. It controls the high inventory level and low inventory level of materials by maintaining the need amount in the industry. It plans manufacturing activities, delivery schedules and purchasing activities in service plant. Finally, Material Requirement Planning (MRP) reduces the maintenance and carrying cost of industry. It improves the unbroken chain of components for service and delivers vehicle on time.

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