

Unit - 4

MRP, MRP II

Objective: Students will be able to understand the concepts of Material Requirements Planning (MRP) and Manufacturing Resource Planning (MRP II) and their significance in modern manufacturing.

I. Introduction

- **What is Planning?**
 - Define planning as the process of determining the best course of action to achieve specific goals.
 - Emphasize the importance of effective planning in any business, especially manufacturing.
- **Challenges in Manufacturing:**
 - Discuss the complexities of manufacturing, such as:
 - Managing inventory levels
 - Meeting fluctuating demand
 - Coordinating production with suppliers and customers
 - Ensuring timely delivery

II. Material Requirements Planning (MRP)

- **Definition:**
 - Define MRP as a computer-based system that uses bill of materials (BOM), inventory data, and master production schedule (MPS) to calculate the exact number of parts needed and when they are needed.
- **Key Components of MRP:**
 - **Bill of Materials (BOM):** A structured list of all the components required to manufacture a product.
 - **Inventory Records:** Detailed information on the current inventory levels of all components.
 - **Master Production Schedule (MPS):** A detailed plan for the production of end items over a specific period.
- **How MRP Works:**
 - Explain the process of "exploding" the BOM to determine the requirements for all sub-components.
 - Discuss how MRP calculates the net requirements for each component, considering on-hand inventory, scheduled receipts, and planned orders.
- **Benefits of MRP:**
 - Reduced inventory levels
 - Improved on-time delivery
 - Increased production efficiency
 - Better utilization of resources
 - Improved customer service

III. Manufacturing Resource Planning (MRP II)

- **Definition:**
 - Define MRP II as an extension of MRP that integrates all functional areas of a manufacturing company, including:
 - Production planning
 - Inventory control
 - Purchasing
 - Sales and marketing
 - Finance
 - Human resources
- **Key Features of MRP II:**
 - **Capacity Planning:** Assessing the available resources (labor, machinery) to meet production demands.
 - **Shop Floor Control:** Tracking and monitoring production activities on the shop floor.
 - **Financial Planning:** Integrating production plans with financial budgets and forecasts.
- **Benefits of MRP II:**
 - Improved overall business performance
 - Enhanced decision-making capabilities
 - Better coordination between departments
 - Increased profitability

IV. Limitations of MRP and MRP II

- **Data Accuracy:** The accuracy of MRP and MRP II heavily relies on the accuracy of input data (BOM, inventory levels, demand forecasts).
- **Complexity:** Implementing and maintaining MRP and MRP II systems can be complex and expensive.
- **Focus on Short-Term Planning:** MRP and MRP II are primarily focused on short-term planning and may not be effective for long-term strategic decisions.

V. Conclusion

- Summarize the key concepts of MRP and MRP II.
- Discuss the importance of these systems in modern manufacturing.
- Briefly mention the evolution of MRP to Enterprise Resource Planning (ERP) systems.

VI. Activities

- Case study: Analyze a case study of a company that successfully implemented MRP or MRP II.
- Group discussion: Discuss the challenges and opportunities of implementing these systems in a specific industry.
- Simulation: Use a software simulation to demonstrate the MRP process.