MRP & DRP

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MRP

- Invented by Dr. Joseph Orlicky in 1960.
- Comprised computer which enabled computation of exact amount of raw materials and sales.
- Software based control system used to manage the manufacturing production.
- Production schedule is exploded with BILL OF MATERIAL into the required amount of raw materials, assemblies needed to produce the final product in a time period say a week or month called as buckets.
- It can replan by calculating net requirements for each inventory item, planning their timing, determining proper coverage.

OBJECTIVES

- Finds availability of materials, components and products
- Maintains lowest possible inventory level.
- Plans manufacturing activities, delivery schedules and purchasing activities.

PROCESS

- ❑ Starts with customer's demand for the quantity of end product and the time when they are needed.
- ❑ Focuses on inbound logistical area.

USES THE FOLLOWING KEY ELEMENTS

- ❑ Master production schedule

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- ❑ Bill of materials
- ❑ Inventory status files
- ❑ MRP Program
- ❑ Outputs & reports
- MRP system had developed into current form in phases.
- First phase is MRP I Materials Requirement Planning
- Second phase is MRP II Manufacturing Requirement Planning

MRP I

- Computer based production and inventory control system that helps in minimizing stocks while maintaining adequate materials for production process.

ADVANTAGES OF MRP I

- Improved business results
- Improved manufacturing results
- Better manufacturing control
- Less inventory
- Less obsolescence
- Higher reliability
- Reduced production costs

DISADVANTAGES OF MRP II

- High materials acquisition and ordering and stock out costs.
- Limitation in the software as it is difficult to adapt in specific situations. So modification is necessary.
- Inaccurate information may result in misplanning, overstock, under stock or lack of appropriate resources.
- Master schedule must be accurate so that it may provide appropriate lengths of time for production.
- MPR systems are costly and time consuming to set up.

MRP II

- Include financial, marketing and logistical elements.
- According to the **American Production and Inventory Control Society Inc (APICS),** MRP II is a method for the effective planning of all resources of a manufacturing company.
- This new version is known as Manufacturing Resource Planning or MRP II.
- Includes all activities involved in planning and control of production.
- Consists of many functions and modules.
- Production planning

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- Resources requirements planning
- Master production scheduling
- Materials requirement planning
- This is also known as CLOSED LOOP MRP.

ADVANTAGES

- ❖ Improvement in overall business performance.
- ❖ Less risk of input obsolescence.
- ❖ Improved customer service level by providing with quick and consistent response in terms of delivery time.
- ❖ Inventory reductions from one fourth to one third.

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- Higher inventory turn over.
- On-time customer delivery.
- Reduction in purchasing costs.

DISADVANTAGES

- ❖ Product manufacturing cost increases.
- ❖ Higher transportation cost.
- ❖ More chance of production disturbance due to unforeseen input delivery problems.
- ❖ Requirement of safety stock goes up for maintaining desired customer level.

DISTRIBUTION REQUIREMENT PLANNING

- Latest IT system to control distribution system.
- Is guided by customer demand.
- Allocates inventory from mother warehouse to other distribution centers based on:

❑ Demand Pattern

❑ Safety stock provision

❑ Order quantity

❑ Reorder point

❑ Average Performance cycle length

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- Success depends upon accuracy of forecast w.r.to time and location requirement across distribution centers.
- It also has two phases: DRP I and DRP II.
- DRP I applies refill inventories in multi level warehousing systems.
- Includes planning of key resources – warehouse space, manpower levels, transport capacity and financial flows.
- When need arises DRP II runs the master schedule, controlling the bill of materials and finally materials requirement planning.
- In simple words, DRP I & DRP II are outgrowths of MRP I & MRP II applied to logistical activities of a firm.

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MARKETING BENEFITS

- Effective new product introduction plans.
- Improved service levels.
- Improved ability to anticipate shortages.
- Improved inventory coordination with other function of the enterprise.

LOGISTICS BENEFITS

- Coordinated shipments reduces freight costs.
- Reduced inventory levels.
- Reduced warehouse space.

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- Lesser back orders

LIMITATIONS

- Needs accurate forecasts.
- Inaccuracy in forecast quantity.
- Inaccuracy in forecast location.
- Inaccuracy in forecast time.
- Variable performance cycles.
- Buffer for uncertainty

IMPACT OF INVENTORY ON THE PROFITABILITY OF THE COMPANY

- Inventory has a big impact on the profitability of the company.
- Number of cases where inefficient inventory mgmt has resulted in closed down of the company.
- In 1980's Mumbai Textile Mills closed down and taken over by the govt on account of continuous loss.
- Primarily due to excess and non moving inventories.
- Thus efficient inventory mgmt can take the company to new heights & inefficient inventory mgmt can ruin the company.

IMPACT OF EXCESS INVENTORY

- Large amount of funds get blocked in inventory.
- Heavy cost of carrying inventory.

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- High risk of obsolescence.
- Poor liquidity & cash crunch.

IMPACT OF INVENTORY SHORTAGE

- ❑ Prodn. May stop due to unavailability of raw materials.
- ❑ Customer’s order execution may get delayed.
- ❑ Machinery & workers may remain idle.
- ❑ Excess purchase cost may be incurred.
- ❑ Loss of customers & goodwill.

IMPACT OF APPROPRIATE INVENTORY

- ❑ Low inventory mgmt cost

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- Smooth overall functioning.
- Good liquidity.
- High efficiency & profitability.