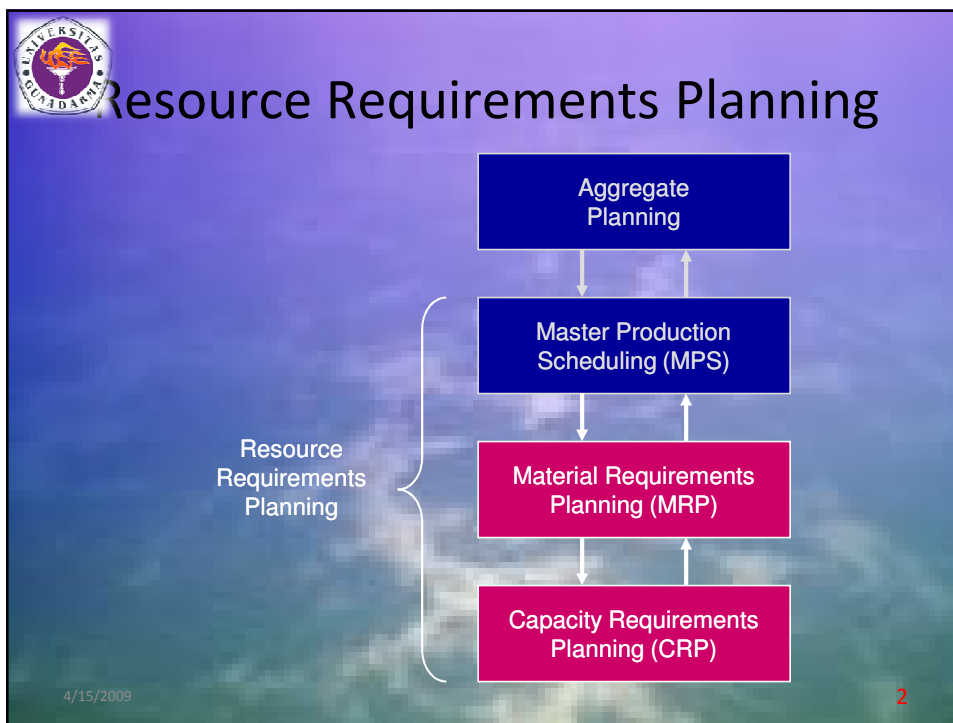
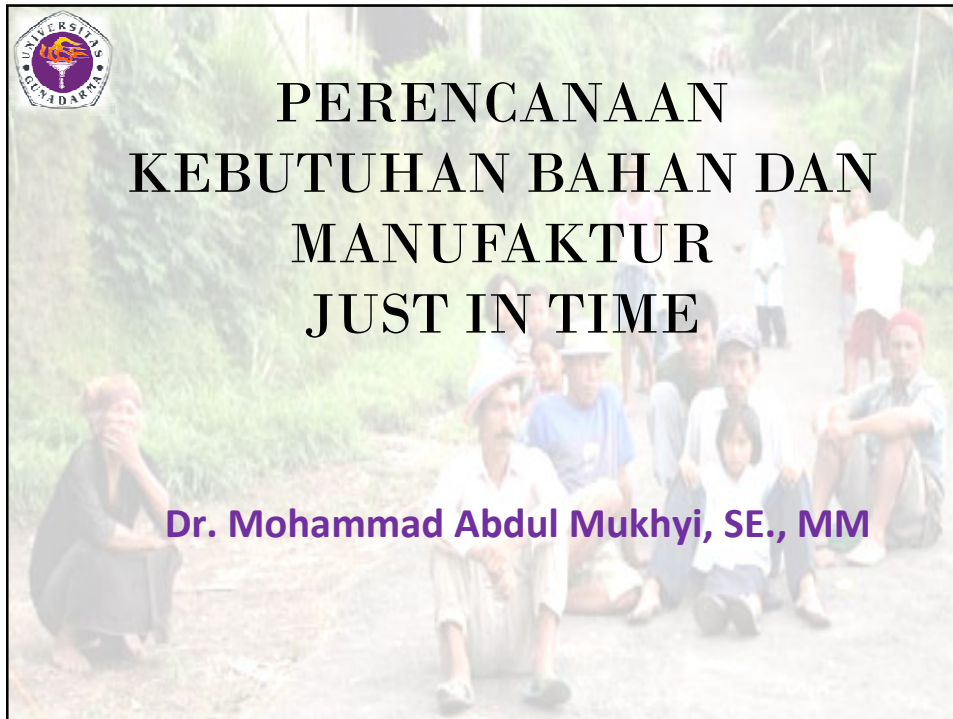


PERENCANAAN KEBUTUHAN BAHAN DAN MANUFAKTUR JUST IN TIME

Dr. Mohammad Abdul Mukhyi, SE., MM





Material Requirements Planning (MRP)



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Materials Requirements Planning (MRP)

- Computer based system
- Explodes Master Schedule (MPS) into required amounts of raw materials and subassemblies to support MPS
- Nets against current orders and inventories to develop production and purchased material ordering schedules

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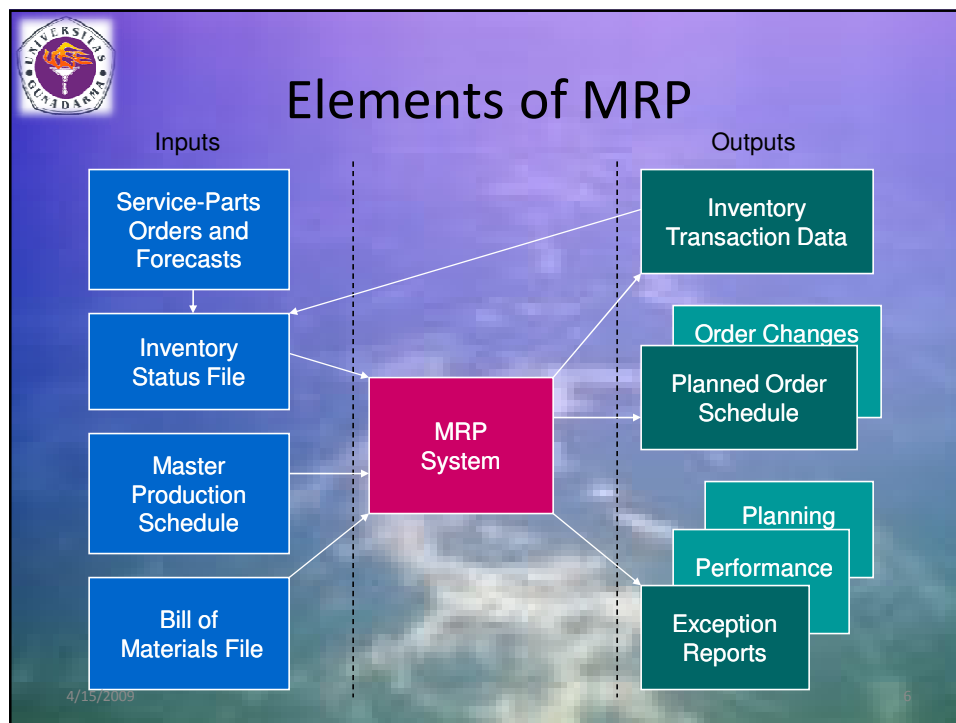


Objectives of MRP

- Improve customer service
- Reduce inventory investment
- Improve plant operating efficiency

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MRP Computer Program

- Begins with number of end items needed
- Add service parts not included in MPS
- Explode MPS into gross requirements by consulting bill of materials file
- Modify gross requirements to get net requirements:
- Net Requirements = Gross Requirements
 - + Allocated Inventory
 - + Safety Stock
 - Inventory On Hand
- Offset orders to allow for lead time

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Outputs of MRP

- Planned order schedule - quantity of material to be ordered in each time period
- Changes to planned orders - modifications to previous planned orders⁸
- Secondary outputs:
 - Exception reports
 - Performance reports
 - Planning reports

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Lot-Sizing in MRP

- Lot-size is the quantity ordered/produced at one time
- Large lots are preferred because:
 - Changeovers cost less and capacity greater
 - Annual cost of purchase orders less
 - Price breaks and transportation breaks can be utilized
- Small lots are preferred because:
 - Lower inventory carrying cost
 - Reduced risk of obsolescence
 - Shorter cycle time to produce customer order

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Lot-Sizing Methods

- Economic Order Quantity (EOQ)
 - does not consider quantity discounts
 - does not always provide the most economical approach with lumpy demands
- Lot-for-Lot (LFL)
 - accommodates lumpy demand
- Period Order Quantity (POQ)

The best method, resulting in least cost, depends on cost and demand patterns.

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Issues in MRP

- Lot-Sizing
 - Useful at lower levels but may drive excess inventory when applied at higher levels
- Net Change versus Regenerative MRP
 - Net change may generate too many action notices
 - Regenerative more costly to run but appears to be easier to manage
- ... more

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Issues in MRP

- Safety Stock
 - Use depends on uncertainty of demand..... more uncertain the greater the need for safety stock
- Assemble-to-Order Firms
 - MPS and MRP treated separately from Final Assembly Schedule(FAS)
 - Use Modular Bill of Material


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MRP I to MRP II

- MRP I simply exploded demand (MPS) into required materials
- MRP II became Manufacturing Resource Planning which provides a closed-loop business management system
 - Financial management
 - Shop floor control
 - Operations management
 - Simulation capability

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Evaluation of MRP

- Most beneficial to process-focused systems that have long processing times and complex multistage production steps
- Lead times must be reliable
- Must freeze MPS for some time before actual production... certain demand
- Difficult to implement


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Capacity Requirements Planning (CRP)



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Capacity Requirements Planning (CRP)

- Tests MPS for feasibility
- Utilizes routings to determine labor/machine loads
- If schedule feasible, recommends freezing
- If schedule overloads resources, points out processes that are overscheduled

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Load Schedules

- Compares actual labor and machine hours against available hours
- Offsets schedules between successive stages of production by lead times
- Provides feasible MPS and economically loaded work centers
- Promotes system operating efficiency ... lowers costs!

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