

MANAGING OPERATIONS
Across the Supply Chain

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McGraw-Hill/Irwin

CHAPTER FIFTEEN

Materials and Resource Requirements Planning

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Where We Are Now

Chapter	Relationships	Sustainability	Globalization	Organizational Culture/Ethics	Change Management	Measurement
Part 1 Supply Chain: A perspective for Operations Management						
1. Introduction to Managing Operations Across the Supply Chain	X	X	X			
2. Operations and Supply Chain Strategy	X	X	X	X	X	X
Part 2 Foundations of Operations Management						
3. Managing Processes and Capabilities	X					X
4. Product/Process Innovation	X	X	X		X	
5. Manufacturing and Service Process Structures	X		X	X		X
6. Managing Quality	X	X	X	X	X	X
7. Understanding Inventory Fundamentals	X		X			X
8. Lean Systems	X		X	X	X	X
Part 3 Integrating Relationships Across the Supply Chain						
9. Customer Management	X					X
10. Supply Management	X	X	X	X		X
11. Logistics Management	X	X	X			
Part 4 Planning of integrated Operations Across the Supply chain						
12. Demand Planning: Forecasting and Demand Management	X		X			X
13. Sales and Operations Planning	X		X			X
14. Independent Demand Inventory Planning	X					X
15. Materials and Resource Requirements Planning	X	X	X	X	X	X
Part 5 Managing Change in Supply Chain Operations						
16. Project Management	X	X	X	X	X	X
17. Evolving Business Models and Change Drivers in the Supply Chain	X	X	X	X	X	X

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Learning Objectives

1. Explain material requirements planning (MRP)
2. Conduct MRP at multiple levels in the bill of materials (BOM)
3. Explain use of distribution requirements planning
4. Conduct capacity requirements planning
5. Describe how material and resource planning works with enterprise requirements planning
6. Explain how advanced planning and scheduling systems improve planning

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Requirements Planning

- **Independent Demand:** demand created by customers
- **Dependent Demand:** demand is driven by demand of another item
- **MRP:** computes demand for dependent items
- **DRP:** computes demand for finished goods in the distribution system
- **CRP:** determines if sufficient resources are available

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MRP and DRP in the Supply Chain

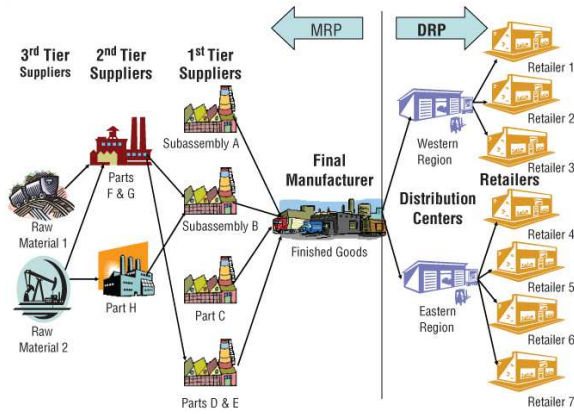


FIGURE 15-1 MRP and DRP in the Supply Chain

Figure 15-1 15-5

MRP Process

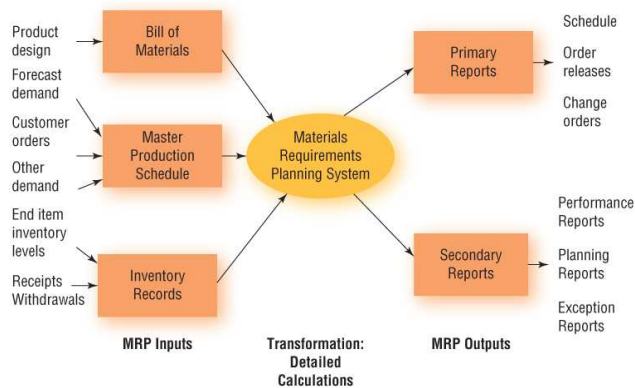


FIGURE 15-3 Overview of the Materials Requirements Planning (MRP) Process

Figure 15-3 15-6

MRP Inputs

- **Bill of Materials (BOM):** detailed listing of all materials needed to make an 'end item';

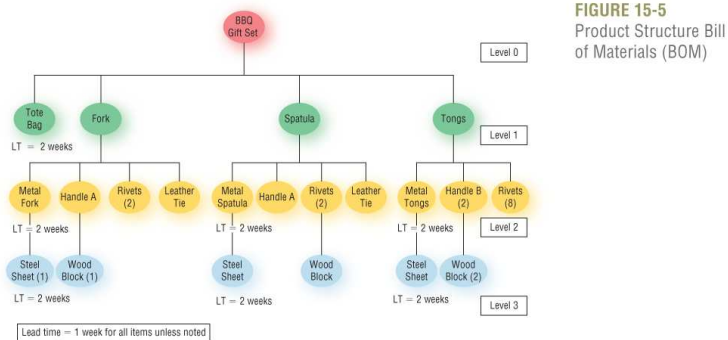


Figure 15-5 15-7

Activity

- Select one of the items below and develop a product structure BOM:
 - Chair
 - Desk
 - 2 dozen cupcakes
 - Set of golf clubs
 - Product of your choice

MRP Inputs

- **Master Production Schedule (MPS):** schedule for building finished products
 - **Time Bucket:** time periods for planning
 - **Planning Horizon:** entire time period covered by the MPS
 - **Available to Promise (ATP):** planned production not already committed to a customer
 - **Rough-cut Capacity Planning:** estimates the critical resources needed to build MPS
- **Inventory Records:** contains information about inventory including amount on hand

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MRP Process

- **Gross Requirements:** total amount of an end item that is required
- **Requirements Explosion:** determines how many additional units are needed
- **Net Requirements:** minimum amount needed in a time period
- **Planned Order Receipt:** amount of an item planned to arrive in a time period
- **Planned Order Release:** amount of an item planned to be ordered in time period

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MRP Inputs and Outputs

FIGURE 15-7 Example of an MRP Record

Part Name:								
MRP Record								
Lead time =								
On-hand inventory =								
Safety stock =								
Order quantity:	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Gross requirements								
Scheduled receipts								
Available inventory								
Net requirements								
Planned order receipts								
Planned order releases								

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Capacity Requirements Planning (CRP)

- **Capacity Requirements Planning (CRP):** an estimate of capacity needed
- **Infinite Loading:** assumption of infinite capacity
- **Load Profile:** comparison of capacity needs to what is needed

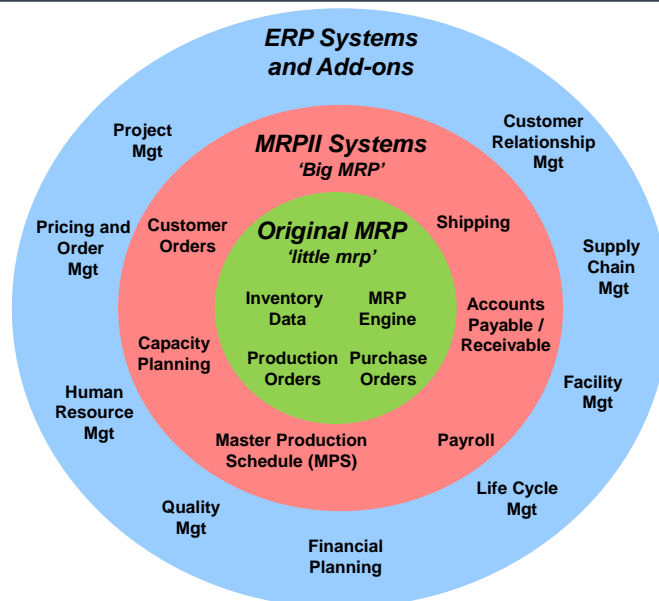
15-12

Advances in Planning Systems

- **Enterprise Requirements Planning (ERP):** software that consolidates all business planning systems and data
- **Advanced Planning and Scheduling (APS):** combines MRP and CRP into one system

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Enterprise Resource Planning (ERP)



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Material & Resource Planning Summary

1. Dependent demand is for raw materials, parts, and subassemblies.
2. MRP inputs include MPS, BOM and inventory records.
3. MRP determines how much and when to order
4. MRP outputs include reports for operations planning
5. DRP applies MRP logic to the distribution network
6. MRP plans must be balanced with available capacity using CRP
7. Technology is streamlining the planning process

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