



8- Impact of Technology on Manufacturing

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E-Business

Source

- ◆ ROSS, D. F., Introduction to Supply Chain Management Technologies. 2nd ed. Boca Raton: CRC Press, 2010 (Chapter 6)

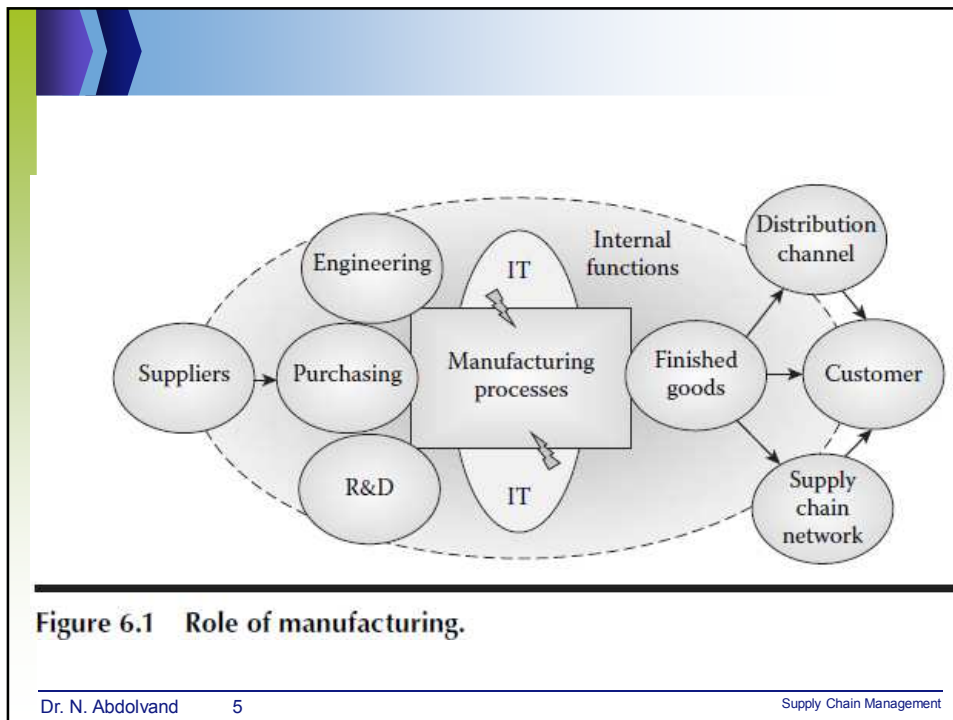
Chapter Outline

- ◆ an examination of today's best business practices and technology toolsets used to effectively manage the manufacturing function.

manufacturing

a single manufacturing location may represent hundreds of millions of dollars of investment, employ tens of thousands of suppliers, thousands of customers, and supply products that are sold for billions of dollars worth of revenue. As such, manufacturing operations typically represent the bulk of cost/value added within a company's supply chain. Achieving actual sellable output in the face of such complexity and interdependency represents a daily logistical triumph

Staid and Matthews, Accenture



Challenges to the Manufacturing Infrastructure

- ◆ *Demand Planning*
 - commodity-based manufacturers: CPFR
 - make-to-order manufacturers: Demand Variability
- ◆ *Management Control and Organizational Structure*
- ◆ *Flexible Manufacturing Infrastructures*
- ◆ *Lean Production Methods*
- ◆ *Fast-Flow Technologies*

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Outsourcing and Supplier Partnerships

- ◆ *Strategically*, outsourcing has been pursued as a method to drive cost reduction, shrink the time necessary for new product innovation, gain quick access to materials and components, and reach global marketplaces
- ◆ *Operationally*, supply partners can assist companies realize demand-pull objectives they would be otherwise incapable of reaching using their own limited competencies
- ◆ The value of an outsourcing program is based squarely on the ability of business partners to provide the right blend of value, quality, price, and delivery that support demand-pull requirements of the manufacturer

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Supply Chain Management

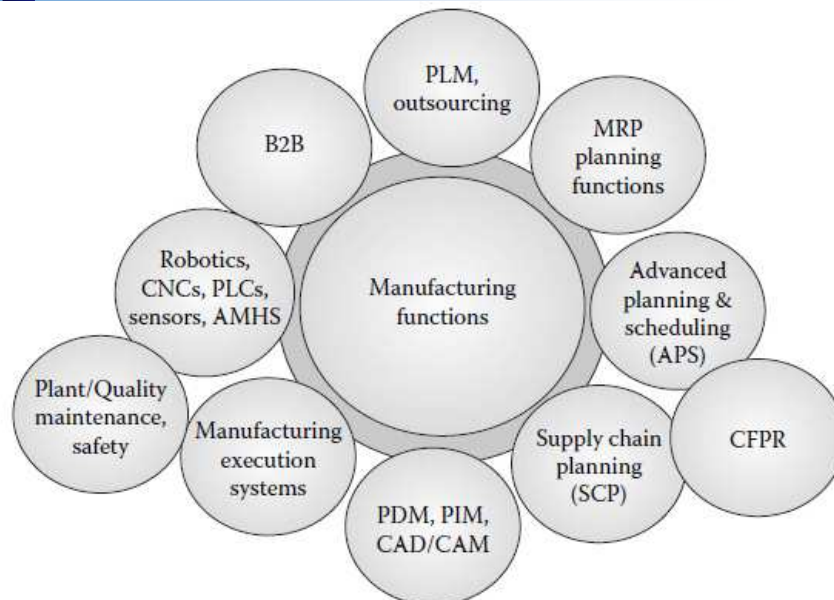


Figure 6.4 Today's manufacturing applications.

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Supply Chain Management

Manufacturing Planning

- ◆ *Material Requirements Planning (MRP).*
- ◆ *Capacity Requirements Planning (CRP).*
- ◆ *Shop Floor Control.*

Production and Process Management

- ◆ The continuous search for new manufacturing philosophies and methods to automate shop floor control and optimize scheduling and integrate it more closely with demand planning has been at the core of today's systems approach to manufacturing.
 - shop floor control
 - scheduling systems
 - machine PLCs
 - automated handling systems (AMHS)
 - MES:
 - a group of applications encompassing order dispatching, operations and detailed scheduling, WIP tracking, labor/ machine positing, maintenance, quality management, and document control

Product Design and Engineering

- ◆ The objective of these applications is to reduce the cost of development and shrink the time from design to product availability
- ◆ CAD/CAM applications can shorten the entire life cycle of design and manufacture.

Plant Maintenance and Quality Management

- ◆ *Plant Maintenance*
 - computerized maintenance management system (CMMS)
- ◆ *Quality Management*
 - statistical process control (SPC) tools

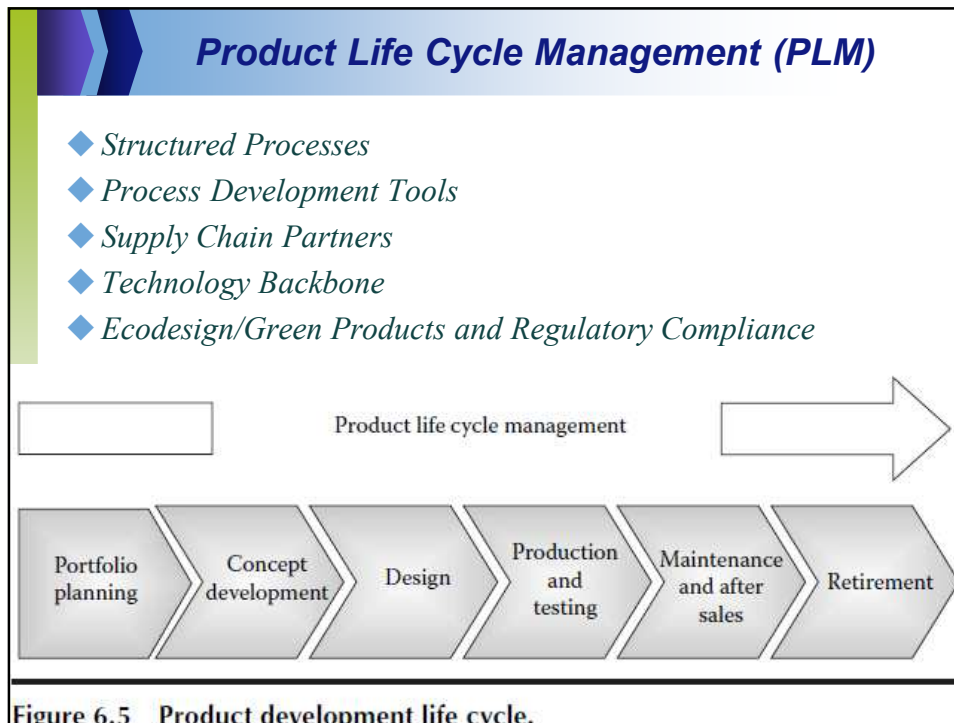
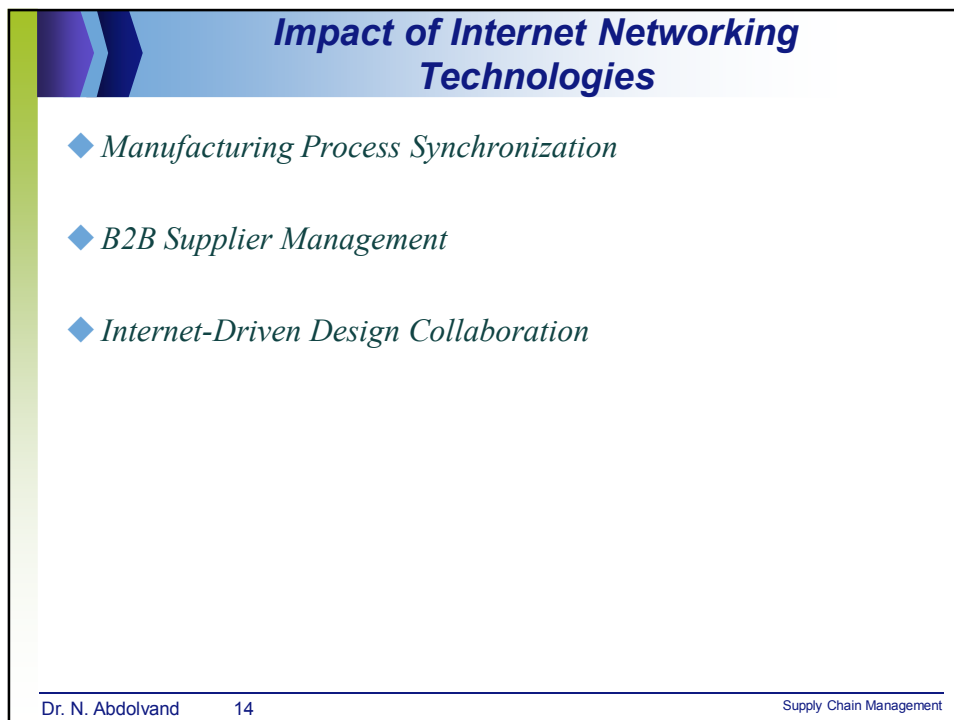


Figure 6.5 Product development life cycle.



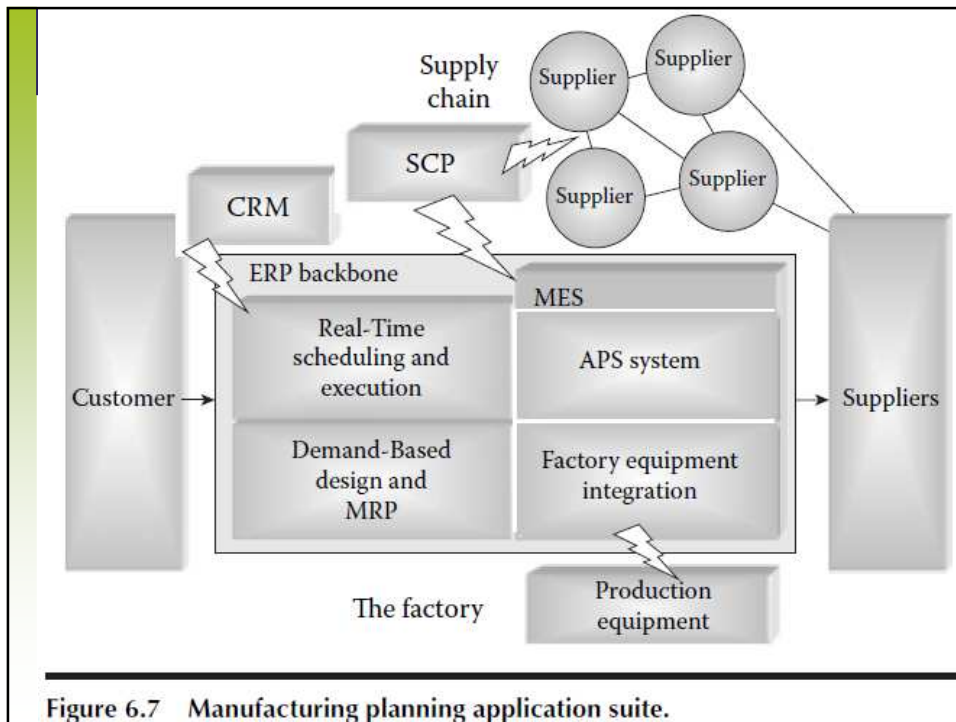
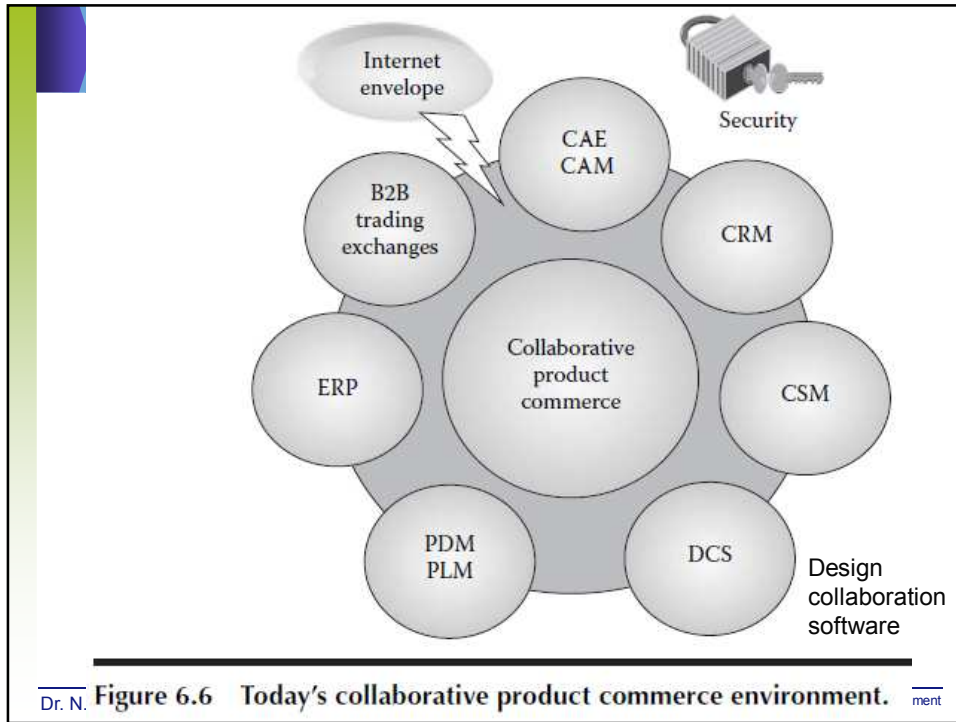
Collaborative Product Commerce

- ◆ *design for cost (1970s)*
- ◆ *design for quality (1980s)*
- ◆ *design for manufacturability (1990s)*
- ◆ *design for the supply chain*

the convergence and rapid deployment of product life cycle management competencies and toolsets found anywhere in the supply chain linked by real-time computer applications focused on the collaborative execution of new products and manufacturing processes to meet the total requirements of the customer.

CPC Processes

- ◆ *Planning and Scheduling*
- ◆ *Design.*
- ◆ *Sourcing and Procurement*
- ◆ *New Product Introduction*
- ◆ *Product Content Management*
- ◆ *Order Management*



Advanced Production and Scheduling Systems

- ◆ *Accurate Data*
- ◆ *Planning Timeframe*
- ◆ *Planning Model*
- ◆ *Schedule Management*

Supply Chain Planning

- | | |
|--|---|
| <ul style="list-style-type: none"> ◆ <i>Accurate Data</i> <ul style="list-style-type: none"> ■ <i>Supply Chain Structure</i> ■ <i>Product Data.</i> ■ <i>Available Capacity for All Resources</i> ■ <i>Costs.</i> ■ <i>Penalties.</i> ■ <i>Future Demand for End Products</i> ■ <i>Feedback to ERP/Server</i> | <ul style="list-style-type: none"> ◆ <i>Planning Timeframe</i> <ul style="list-style-type: none"> ■ <i>tactical,</i> ■ <i>Operational</i> ■ <i>plant execution</i> |
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Advanced Production and Scheduling Systems

◆ *Planning Model*

- *Mathematical Models*
- *Heuristics.*
- *Simulation.*

◆ *Schedule Management*

- A schedule of optimized sequences for all orders and operations
- Realistic schedule of load priorities for each work center
- Sequenced start and finish times for all orders and resources
- Detailed dispatch list for each work center showing order sequence by operation

Questions?