



**ACS-1803**  
**Introduction to Information**  
**Systems**

Instructor: Trevor Nadeau

**Enterprise Information Systems**  
Lecture Outline 6



# Learning Objectives

1. Explain how organizations support business activities by using information technologies across the enterprise.
2. Explain Porter's Value Chain and how the model relates to the functional flow of goods and services within an organization.
3. Describe Supply Chain Management (SCM), Customer Relationship Management (CRM), and Enterprise Resource Planning (ERP) Systems. Describe how they relate to the Value Chain.

# System Categories – Enterprise Systems

- **Enterprise-wide Systems**

aka **Enterprise Systems**, are systems that allow companies to integrate information across operations on a company-wide basis

- **Inter-organizational Systems (IOS)**

Systems that communicate across organizational boundaries whose goal it is to streamline information flow from one company to another

# Enterprise Resource Planning – Value Creation

- An enterprise system is central to an organization
  - Ensure information can be shared across all business functions and all levels of management to support the running and managing of a business
- The ultimate goal is to satisfy customers and provide a competitive advantage by reducing costs and improving service
  - Create Value – transform inputs into outputs valued by the customer
  - Organizations create value by performing activities at lower cost or enhancing differentiation of products or services.
    - Information Systems streamline the processing of those activities



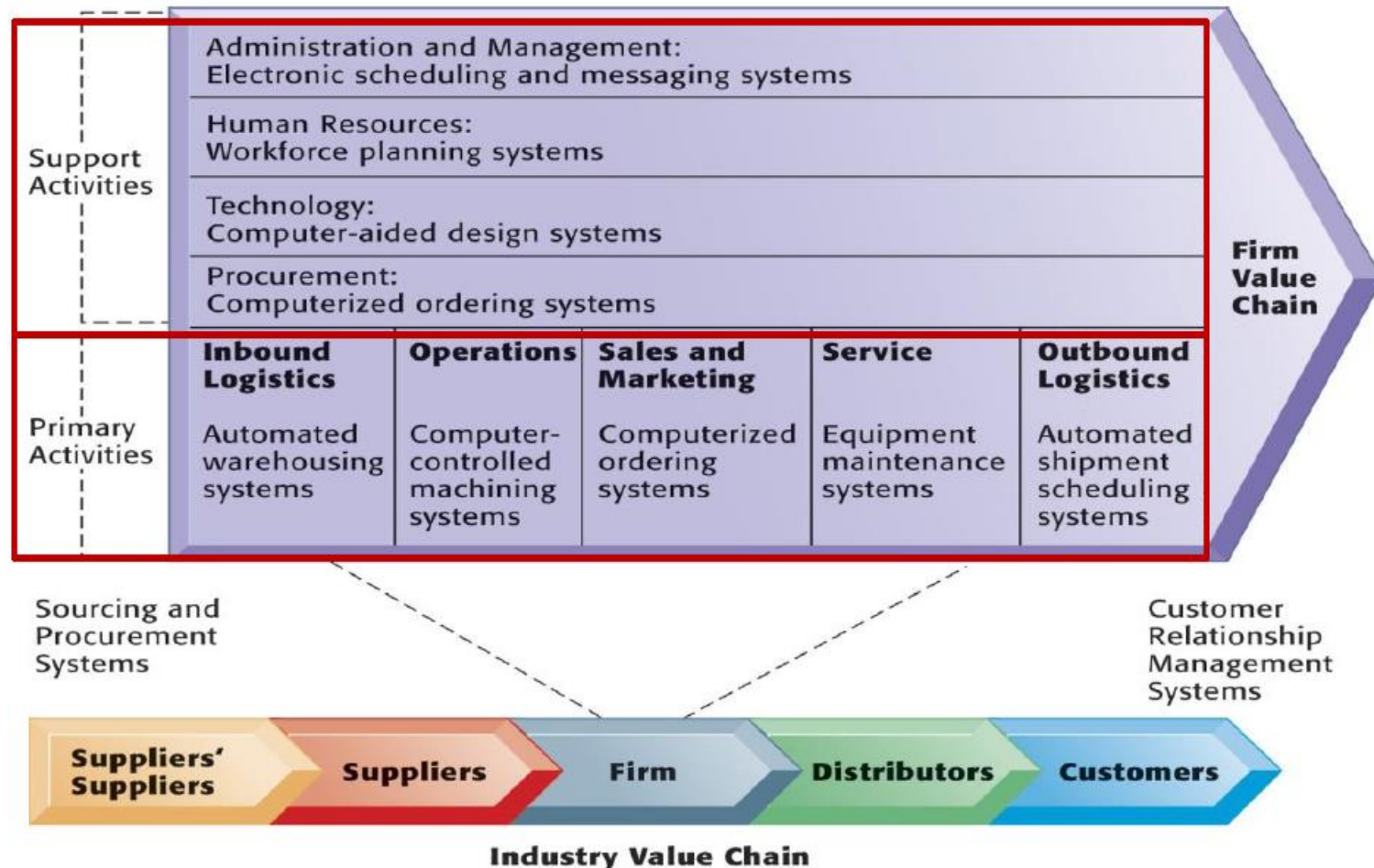
# Business Value Chain

Managing materials, services and information from suppliers through to the organization's customers

# Business Value Chain Analysis

- **Value Chain Analysis (Porter 1985, 2001 )**

Is a process of **analyzing** an organization's **activities** to determine where **value is added** to **products** and/or **services** and what **costs** are incurred in doing so.



# The Business Value Chain - Primary Activities

- **Functional areas** within an organization that process **inputs** and produce **outputs**. These activities may vary widely based on the unique requirements of a company's industry
- **Primary Activities** include:
  - **Inbound Logistics** – receiving and stocking raw materials, parts, products
  - **Operations/Manufacturing** – processing orders and raw materials into finished product
  - **Outbound Logistics** – distribution of the finished product to customers
  - **Marketing and Sales** – creating demand for the product (pre-sales activities)
  - **Customer Service** – providing support for the product or customer (post-sales activities)

# The Business Value Chain - Support Activities

- **Support activities** are **business activities** that enable **Primary Activities**. These activities can be unique by industry but are generally more typical across industries.
- **Support Activities** include:
  - **Infrastructure** – hardware and software that must be implemented to support applications for primary activities
  - **Human Resources** – employee management activities: hiring, interview scheduling, and benefits management
  - **Technology Development** – the design and development of applications that support the organization
  - **Procurement** – purchase of goods or services that are required as inputs to primary activities



# Information Systems Roles in the Value Chain

- **Systems** play a significant role throughout the **Value Chain** to achieve competitive advantage and:
  - Must be **appropriate** for the business strategy (e.g. cost)
  - Are usually coupled with **Business Process Reengineering** that addresses process to enhance company operations

# Information Systems Roles in the Value Chain

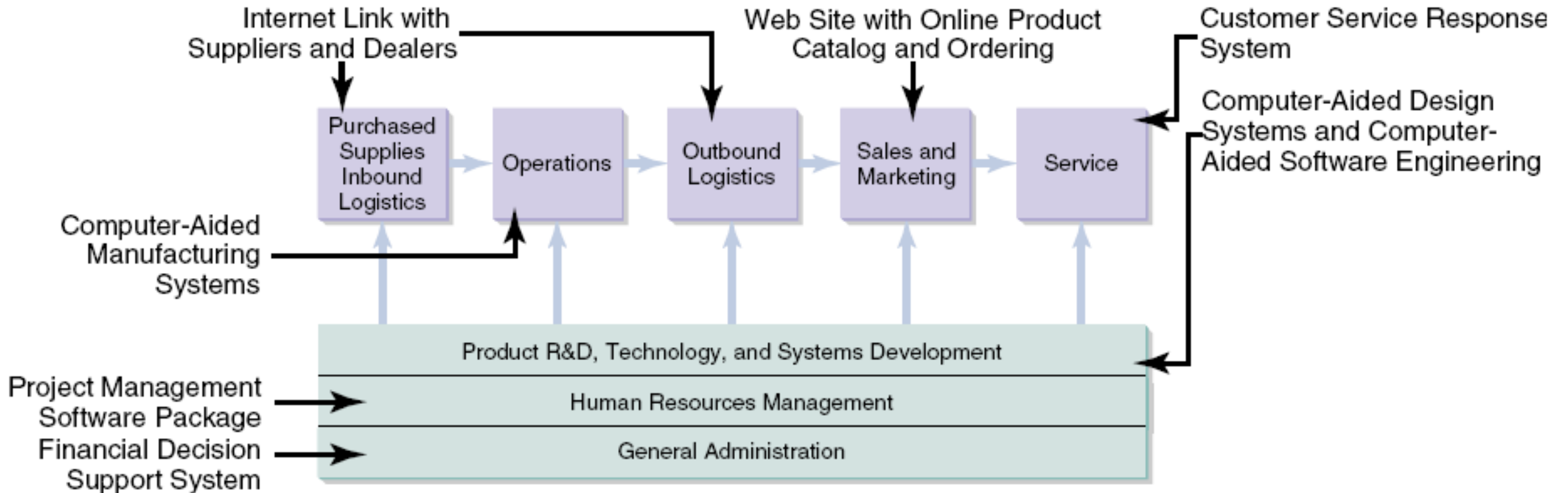
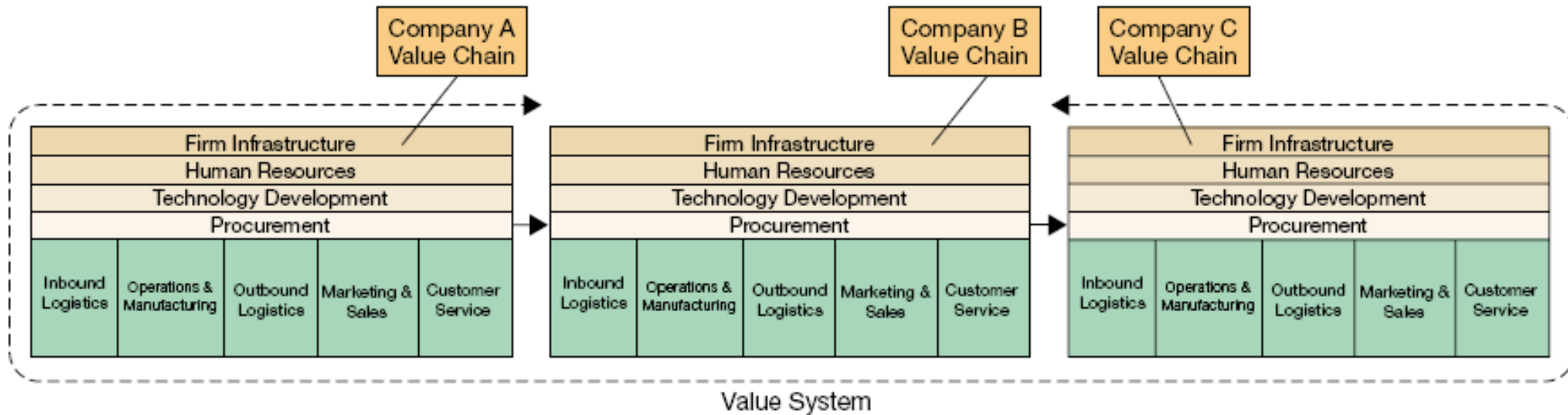


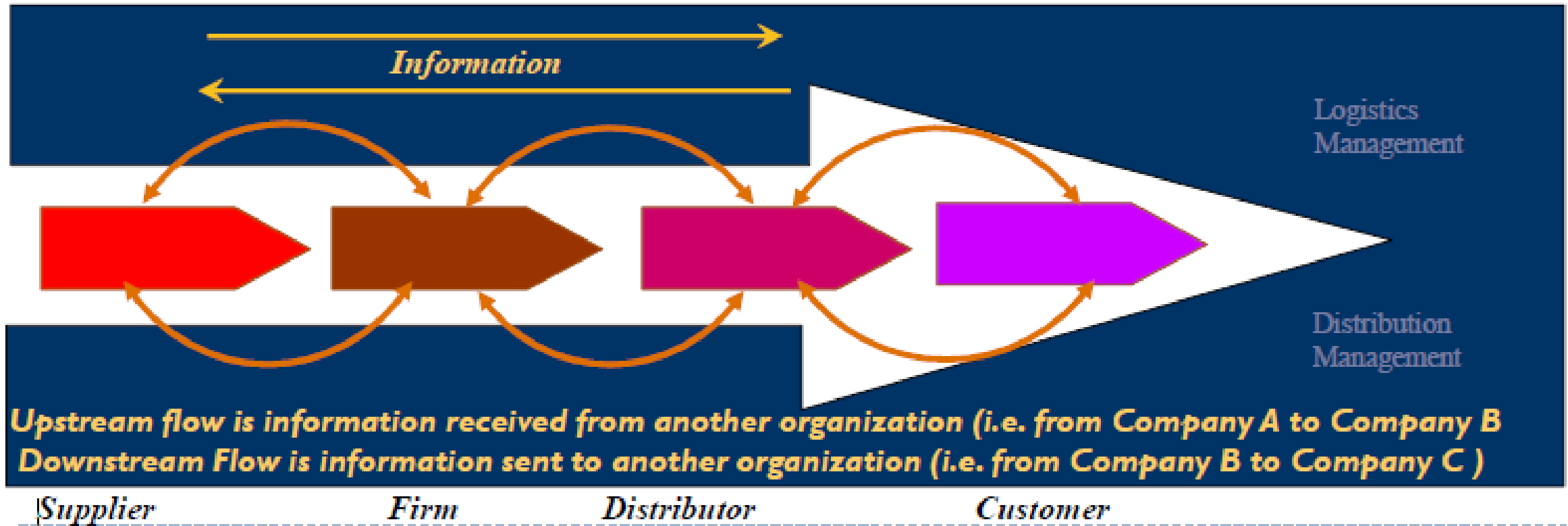
Figure 2.6 ➔ Sample value chain and corresponding sample uses of information systems to add value.

# A Business Value System – Organizational Focus

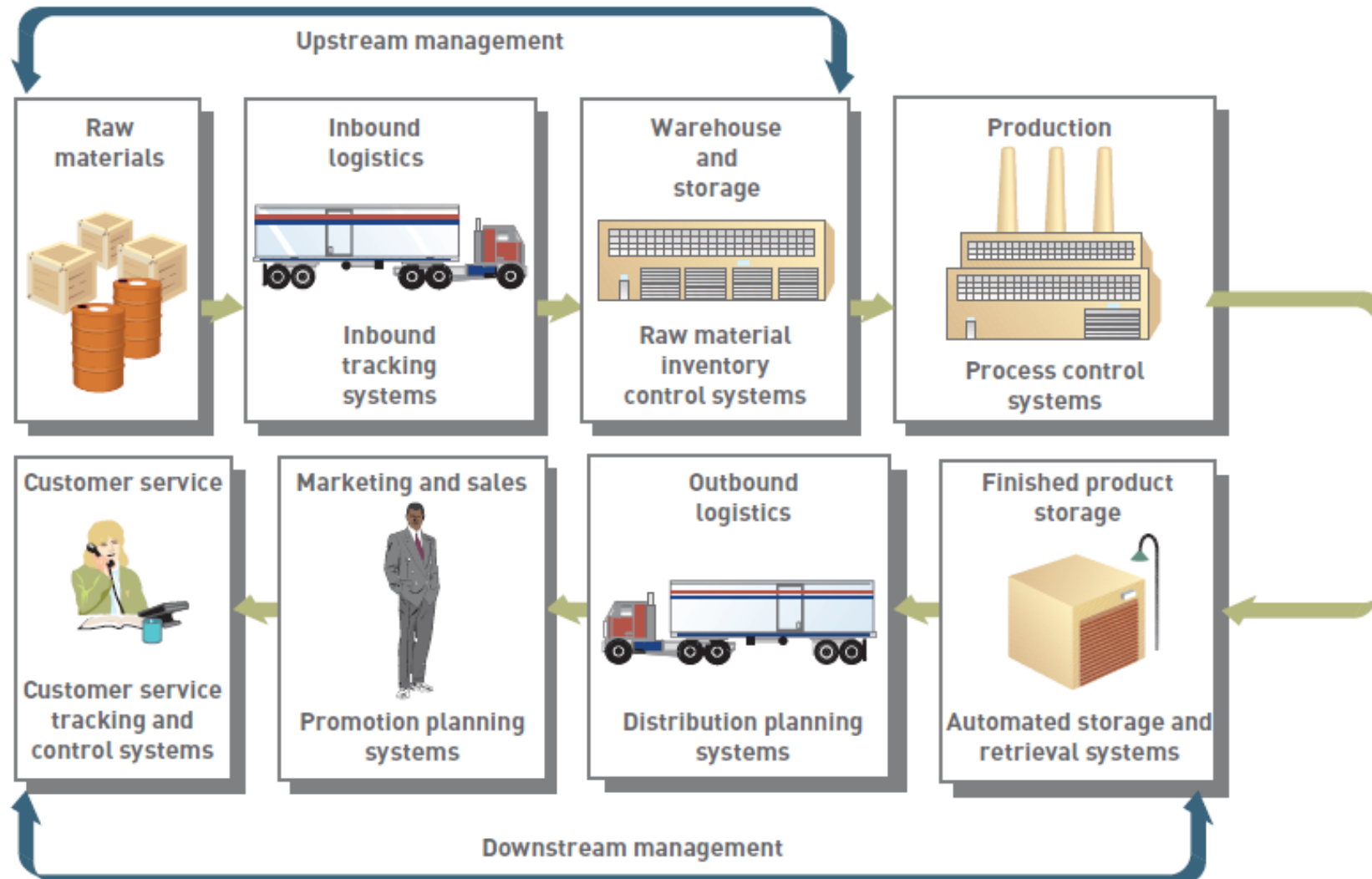


# A Business Value System – Organizational Focus

*Moving the product efficiently from supplier to customer*



# A Business Value System – Organizational Focus (con't)



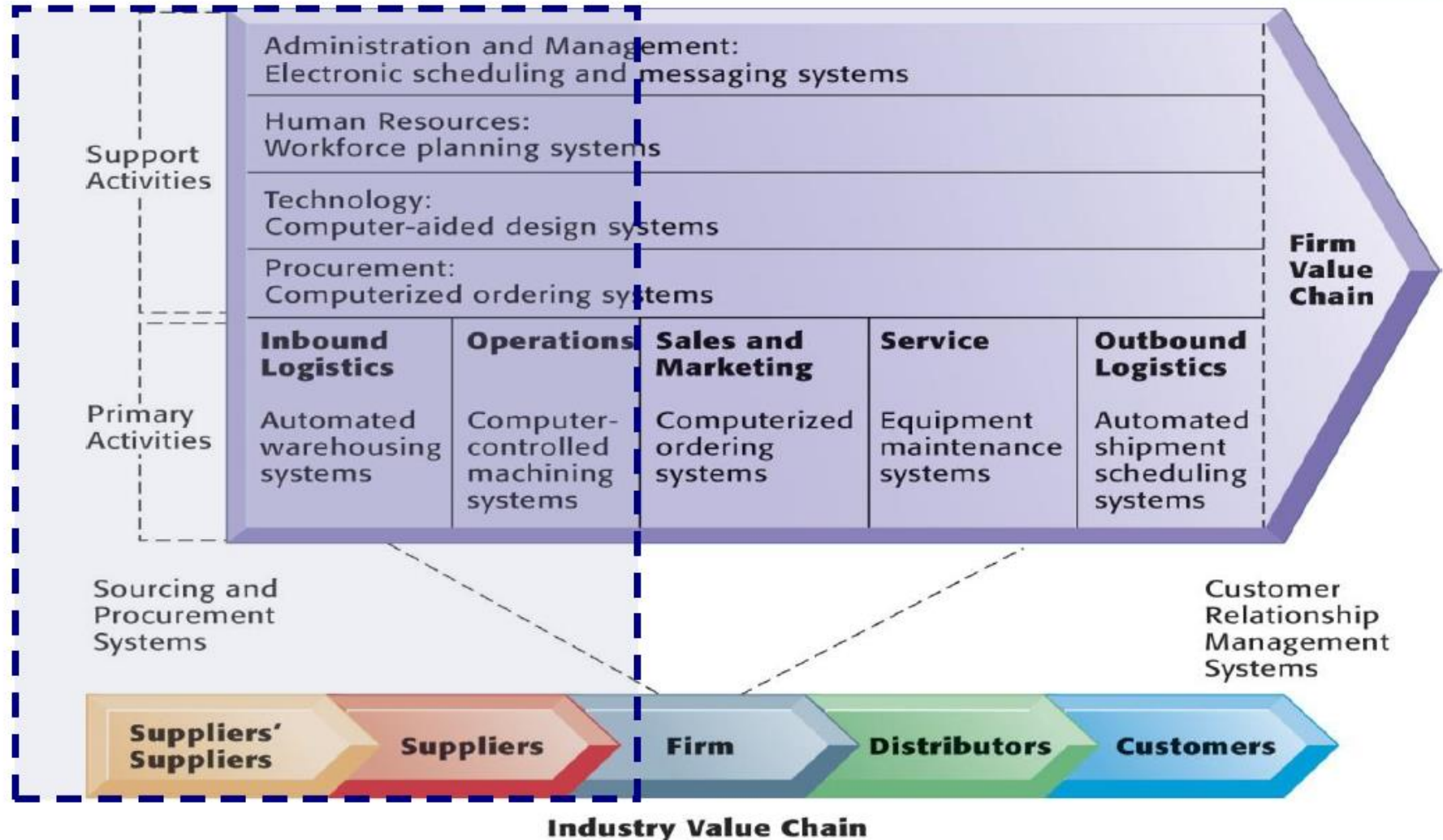


# Supply Chain Management (SCM) Systems

Managing materials, services and information from suppliers through to the organization's customers

# Information Systems Roles in the Value Chain

## Supply Chain Management (SCM) Systems



# Supply Chain Management (SCM)

- Supply Chain: flow of materials, services and information from suppliers of merchandise and raw materials through to the organization's customers
- Supply Chain Management: processes and procedures used to ensure the delivery of goods and services to customers at the lowest cost while providing highest value to the customers



# Supply Chain Management (SCM)

**Objective** Applications that accelerate product development and reduce cost associated with procuring raw materials, components, and services from its suppliers

- **Supply Chain** – the suppliers that an organization purchases from directly
- **Supply Network** – the suppliers that an organization purchases from directly and its suppliers

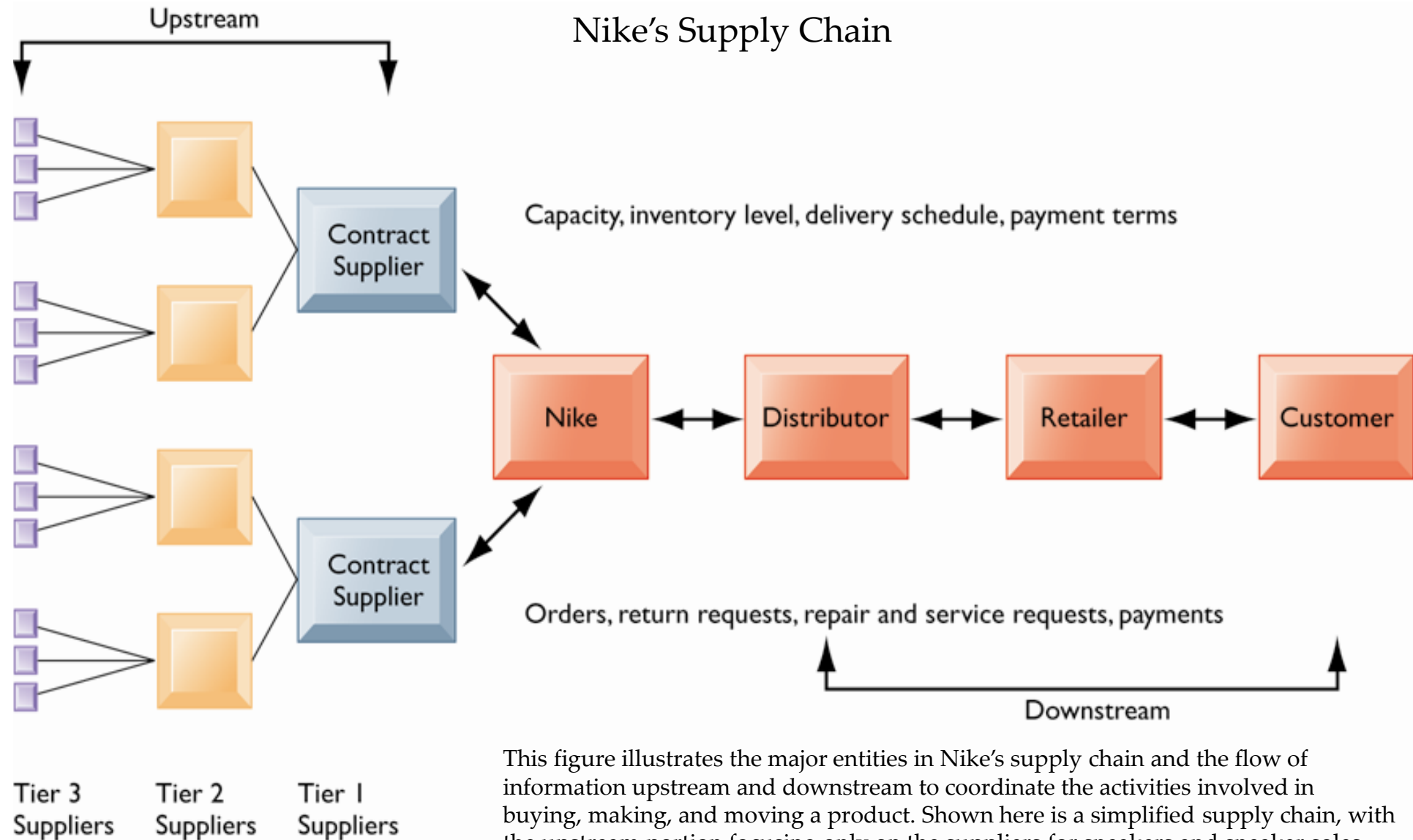
**Sources** There are two primary sources of SCM systems. These systems are built to tightly integrate with ERP systems

- **SCM Software Vendors** – Agile, Ariba, I2, Manugistics, Commerce One, etc.
- **ERP Vendors** – SAP, Baan, Oracle, etc

# Supply Chain Management (SCM)

Supply Chain: flow of materials, services and information from suppliers of merchandise and raw materials through to the organization's customers

Supply Chain Management: processes and procedures used to ensure the delivery of goods and services to customers at the lowest cost while providing highest value to the customers



This figure illustrates the major entities in Nike's supply chain and the flow of information upstream and downstream to coordinate the activities involved in buying, making, and moving a product. Shown here is a simplified supply chain, with the upstream portion focusing only on the suppliers for sneakers and sneaker sales.

# SCM – Example of SCM and ERP Offering

- SCM and ERP software applications capabilities include the following:

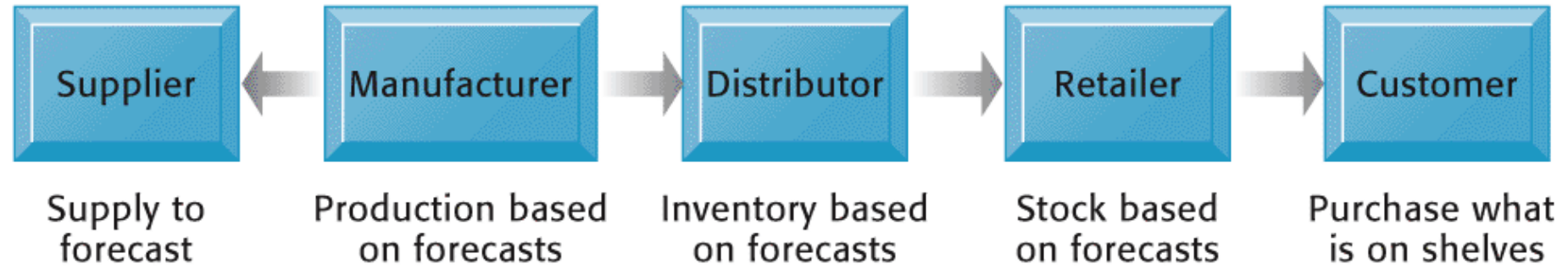
Capability	Explanation
Planning	Enables you to model supply chains by providing comprehensive planning capabilities, including supply chain design, demand and supply planning, manufacturing planning, and transportation planning
Execution	Integrates planning, promising, logistics, and transactional systems through materials management, manufacturing execution, order promising, transportation execution, and warehouse management—augmented with radio frequency identification (RFID) technology
Coordination	Lets you monitor and analyze processes both within and outside your company by providing supply chain event management and supply chain performance management
Collaboration	Enables you to share information and set and achieve common supply chain goals through collaborative planning, forecasting, and replenishment (CPFR), support for vendor-managed inventory (VMI), and support for supplier-managed inventory (SMI)

# Supply Chain Management Benefits

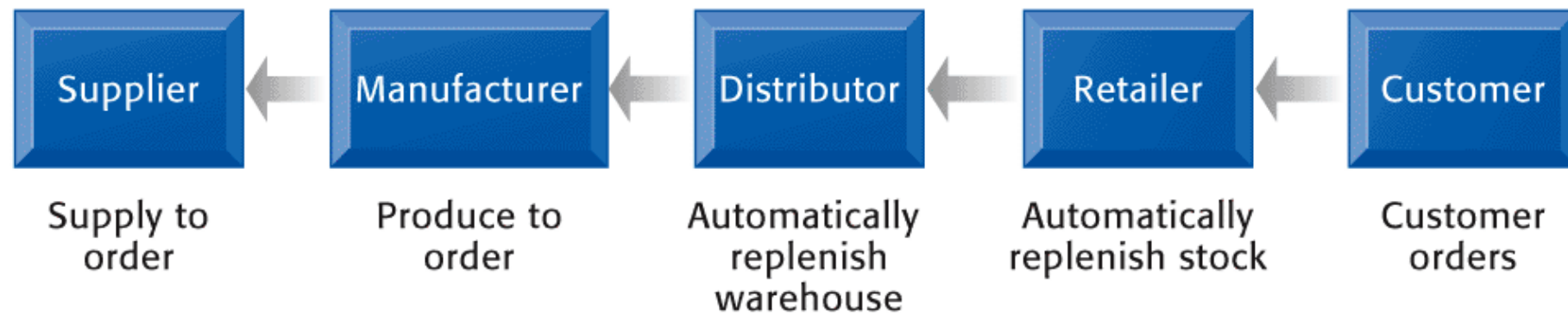
- **Supply Chain Management** applications can help organizations to gain competitive advantage and provide substantial payback in several ways by:
  - Streamlining **workflow** and increasing **employee productivity** (i.e. efficiently managing business travel, time, and expenses by collaborating with suppliers in real time)
  - Accelerating **product development** (i.e. enabled by the ability of organizations to swiftly react to market conditions)
  - Streamlining **cost** and creating **efficiencies** across the supply network (i.e., supporting contract negotiation and measuring effectiveness of those agreements)

# Supply Network - PUSH vs PULL Based Supply Chain Models

## Push-Based Model



## Pull-Based Model



The difference between push- and pull-based models is summarized by the slogan  
“Make what we sell, versus sell what we make.”

# The Supply Network

- Push-based model
  - Based on forecasts of demand for products, and products are “pushed” to customers
  - Suppliers are gaining access to an organization’s supply planning system to assure an ability to fulfill orders
- Pull-based model
  - Supply chain driven by actual customer orders or purchases
  - Producing organization is opening its systems to the customer to allow the customer to view inventory and production levels before placing orders

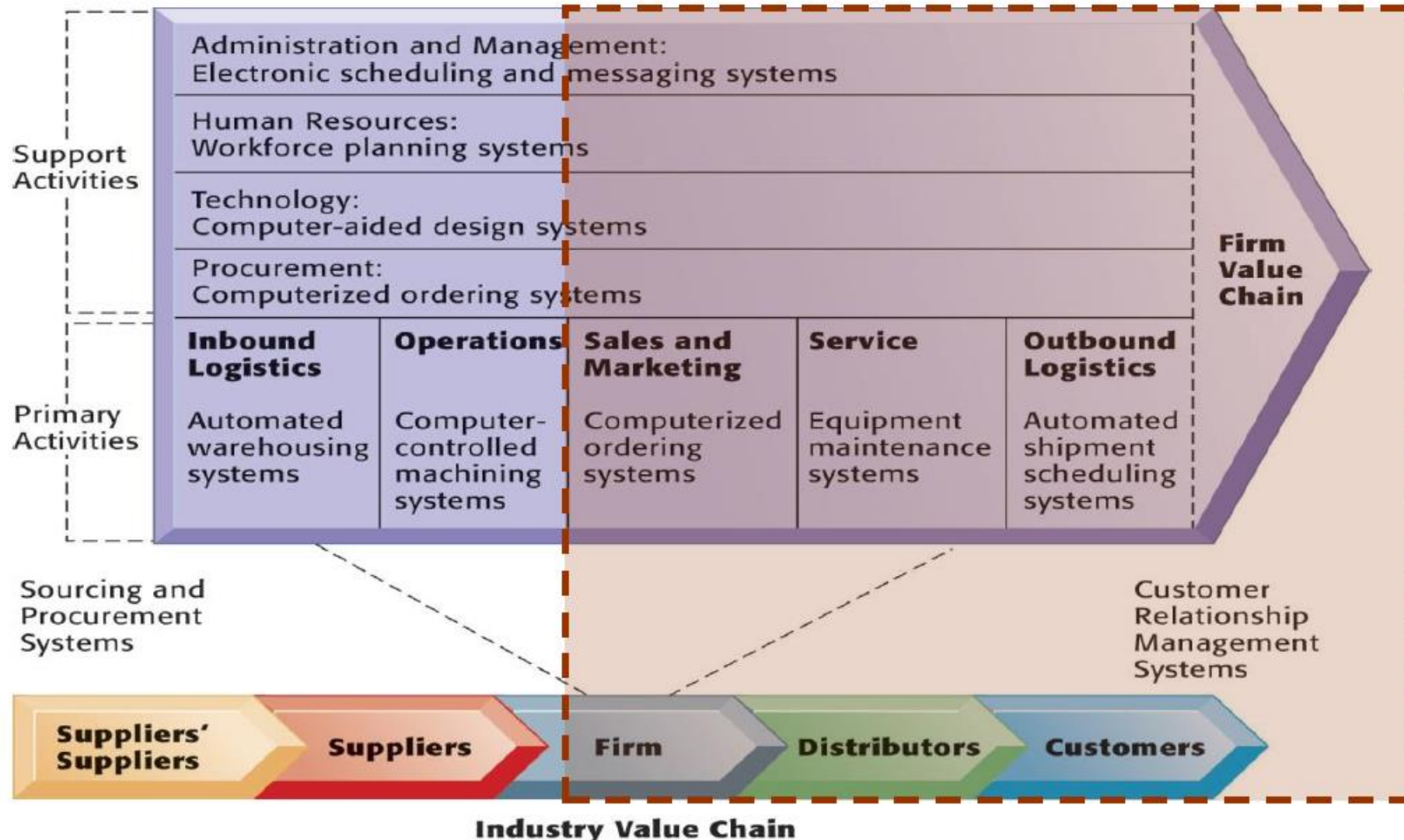


# Customer Relationship Management (CRM) Systems

Managing materials, services and information from suppliers through to the organization's customers

# Information Systems Roles in the Value Chain

## Customer Relationship Management (CRM) Systems





# Customer Relationship Management (CRM) Systems

- Capture and integrate customer data from all over the organization
- Consolidate and analyze the data
- Distribute results to various systems and customer touch points across the enterprise
- Provide a single touch point for the customer.

# CRM Systems (con't)

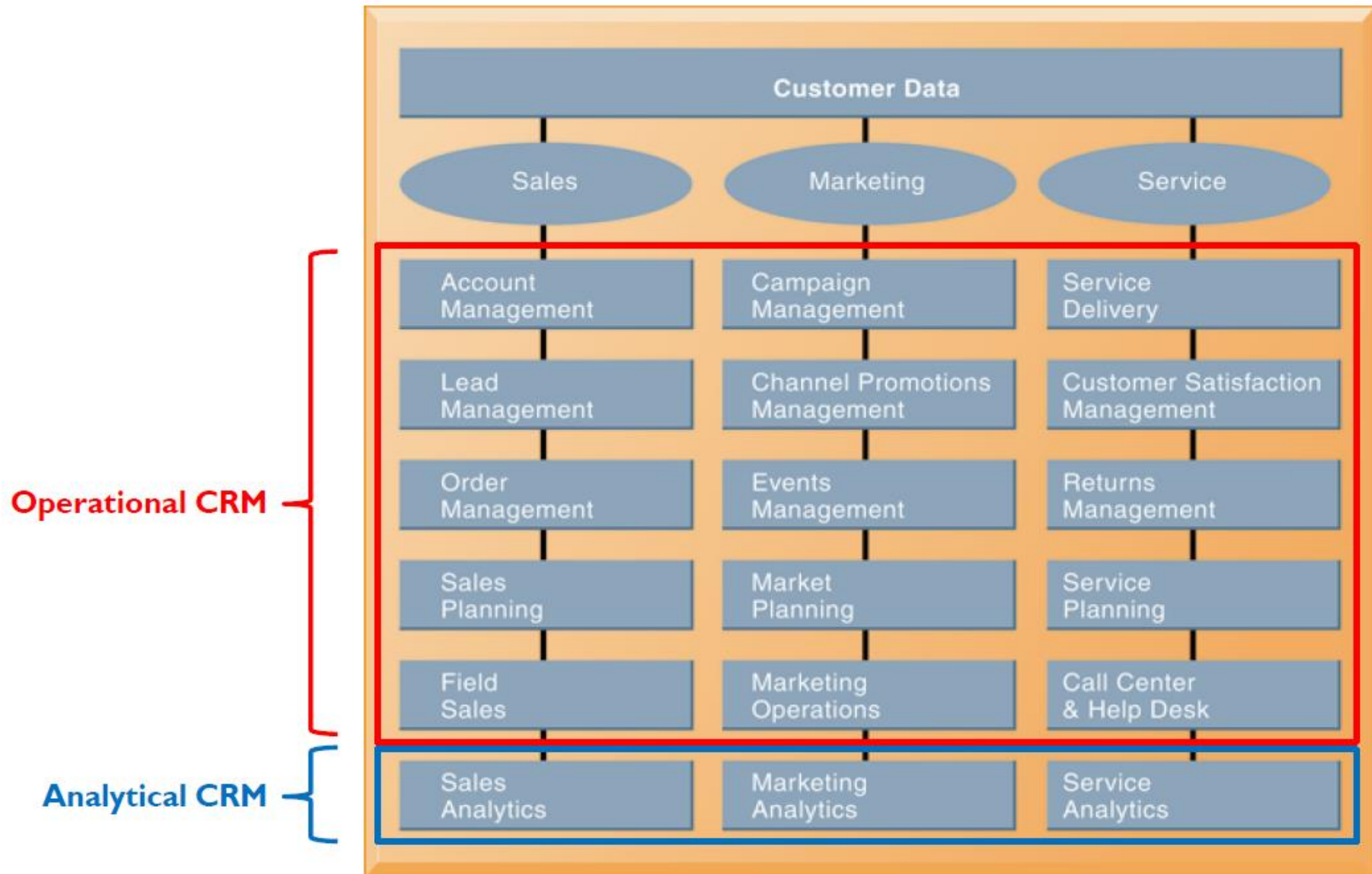
CRM systems examine customers from a multifaceted perspective. These systems use a set of integrated applications to address all aspects of the customer relationship, including customer service, sales, and marketing.



# CRM Systems (con't)

- Business Value of Customer Relationship Management Systems
  - Increased customer satisfaction
  - More effective marketing and reduced direct marketing costs
  - Lower costs for customer acquisition and retention
  - Increased revenue from identifying most profitable customer and segments for marketing, cross-selling, up-selling
  - Reduced churn rate (Number of customers who stop using or purchasing products or services from a company)

# Operational and Analytical CRM



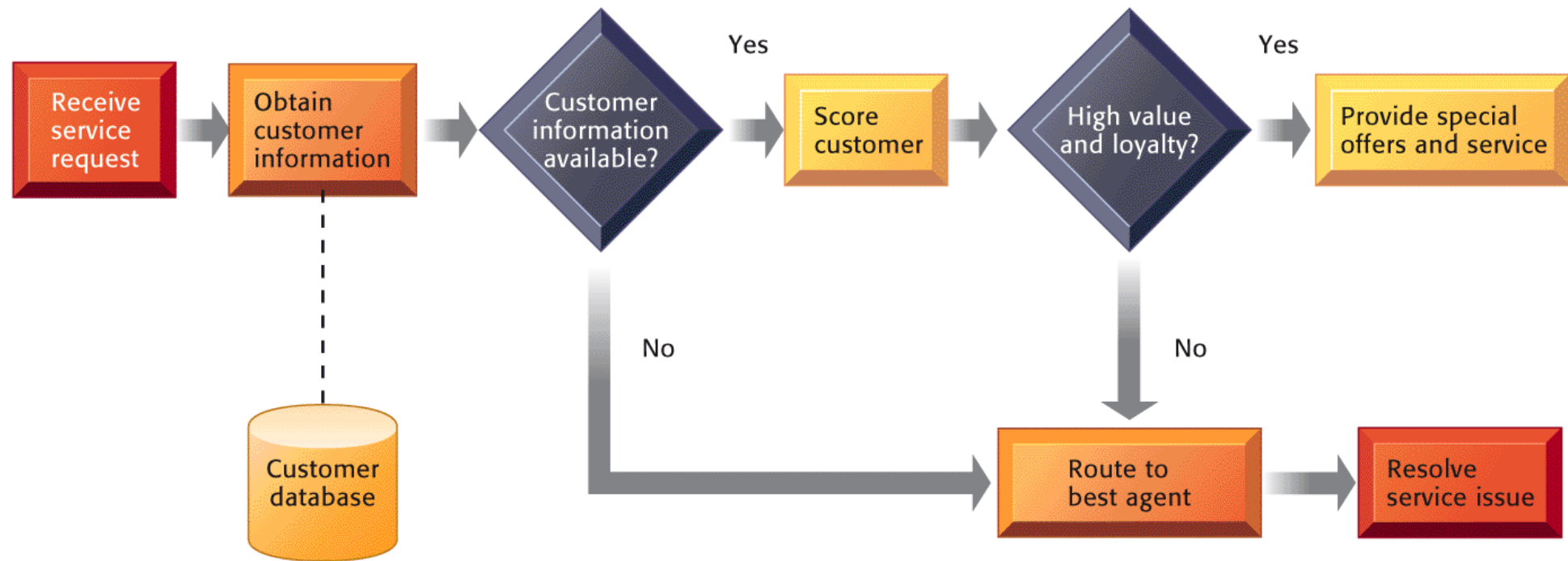
# Operational and Analytical CRM

- Operational CRM:
  - Customer-facing applications, such as sales force automation, call centre and customer service support, and marketing automation
  - Examples: Campaign management loyalty programs (Air Miles), e-marketing, account and contact management, lead management, telemarketing, teleselling, e-selling, field sales

# Operational CRM Systems

## Customer Loyalty Management Process Map

**FIGURE 14-13** Customer loyalty management process map



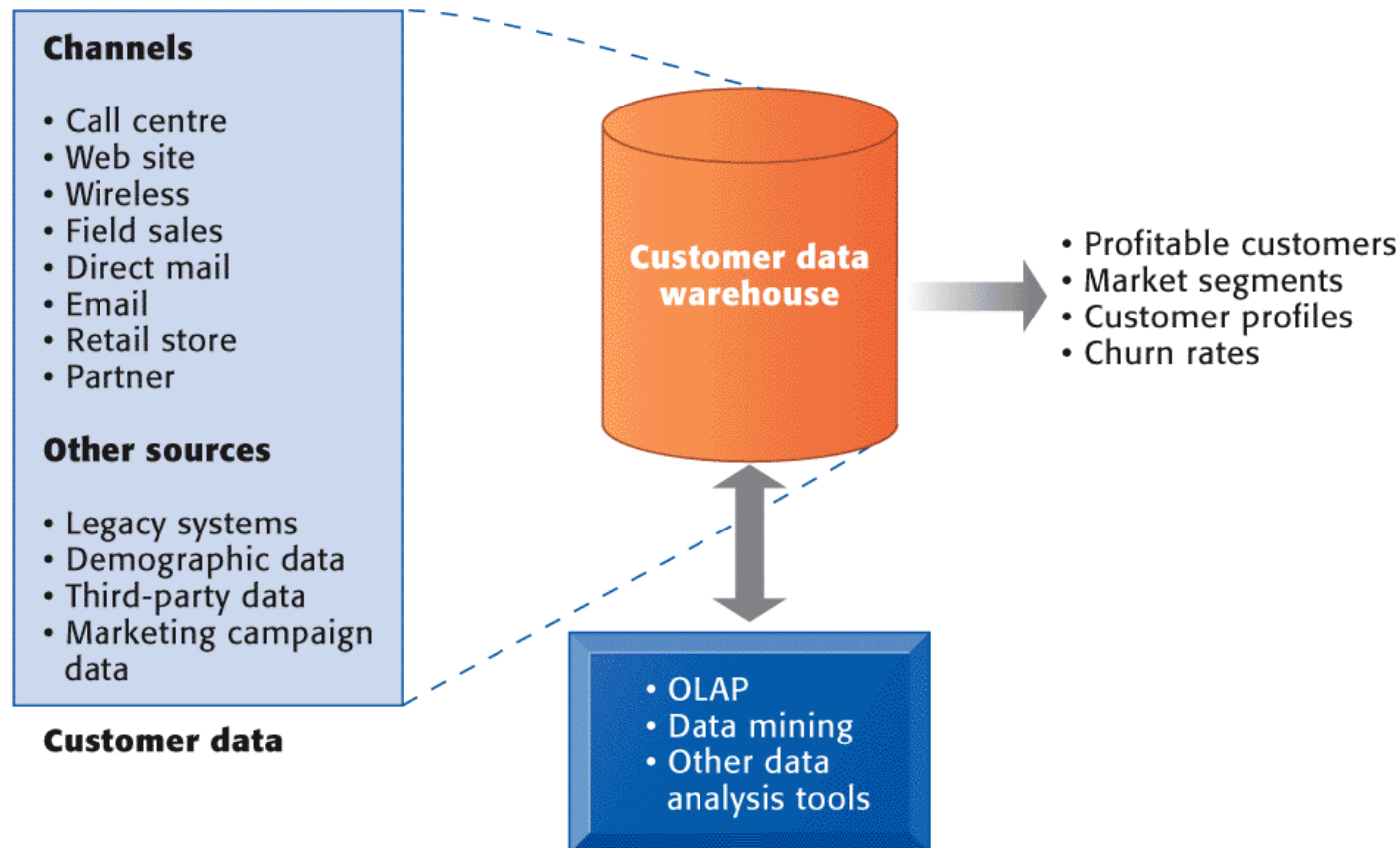
This process map shows how a best practice for promoting customer loyalty through customer service would be modelled by customer relationship management software. The CRM software helps firms identify high-value customers for preferential treatment.

# Analytical CRM Systems\*

- Analytical CRM:
  - Applications that analyze customer data generated by operational CRM applications to provide information for improving business performance
  - Examples: Develop customer segmentation strategies and customer profiles; analyze customer or product profitability; identify trends in sales length cycle; analyze leads generated and conversion rates

# Analytical CRM Systems

**FIGURE 14-14** Analytical CRM data warehouse.

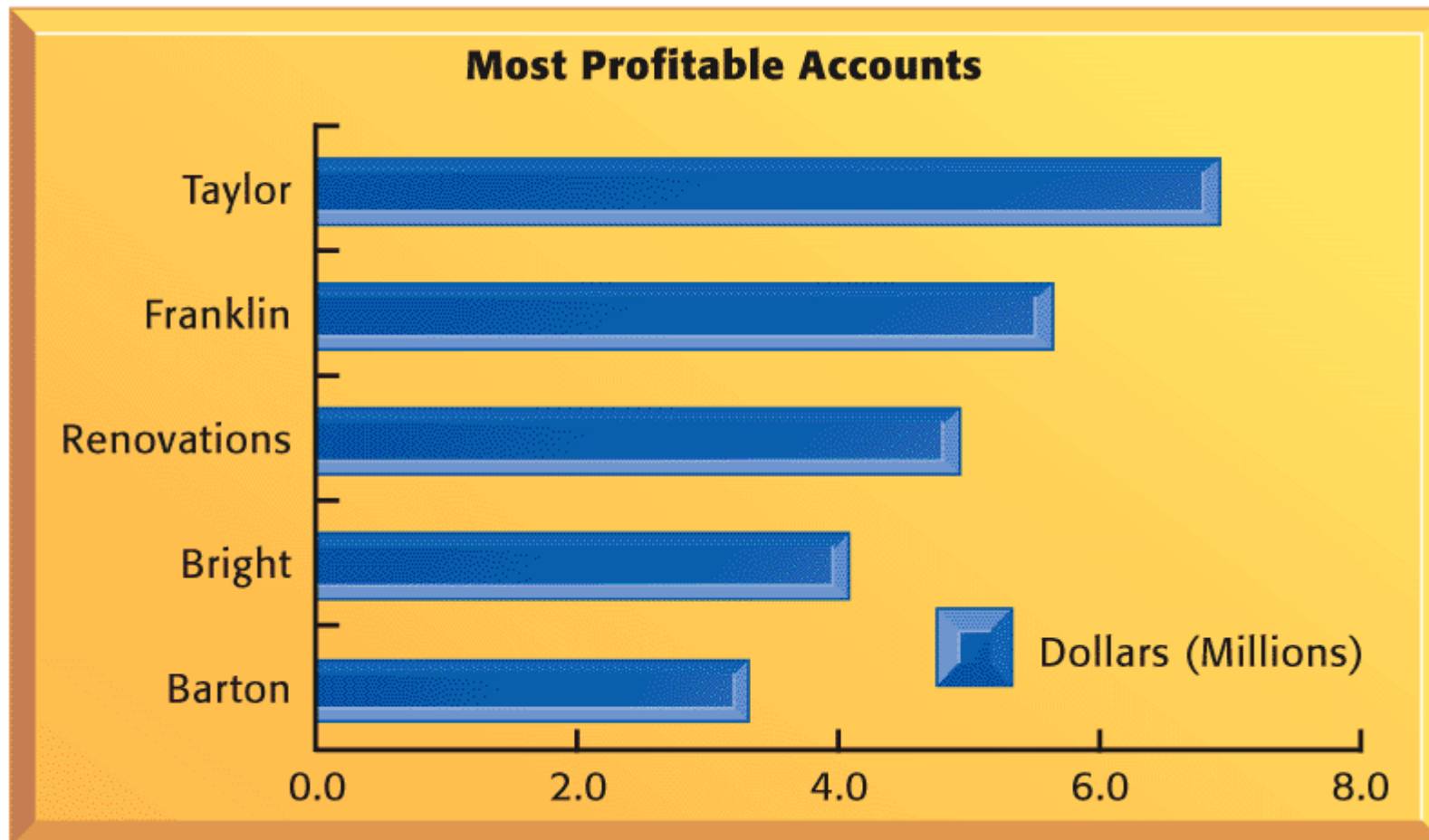


Analytical CRM uses a customer data warehouse and tools to analyze customer data collected from the firm's customer touch points and from other sources.



# Analytical CRM Systems

- Analytics: Help identify the most important customers, predict future buying patterns, and position the correct resources to increase sales



# Analytical CRM Systems

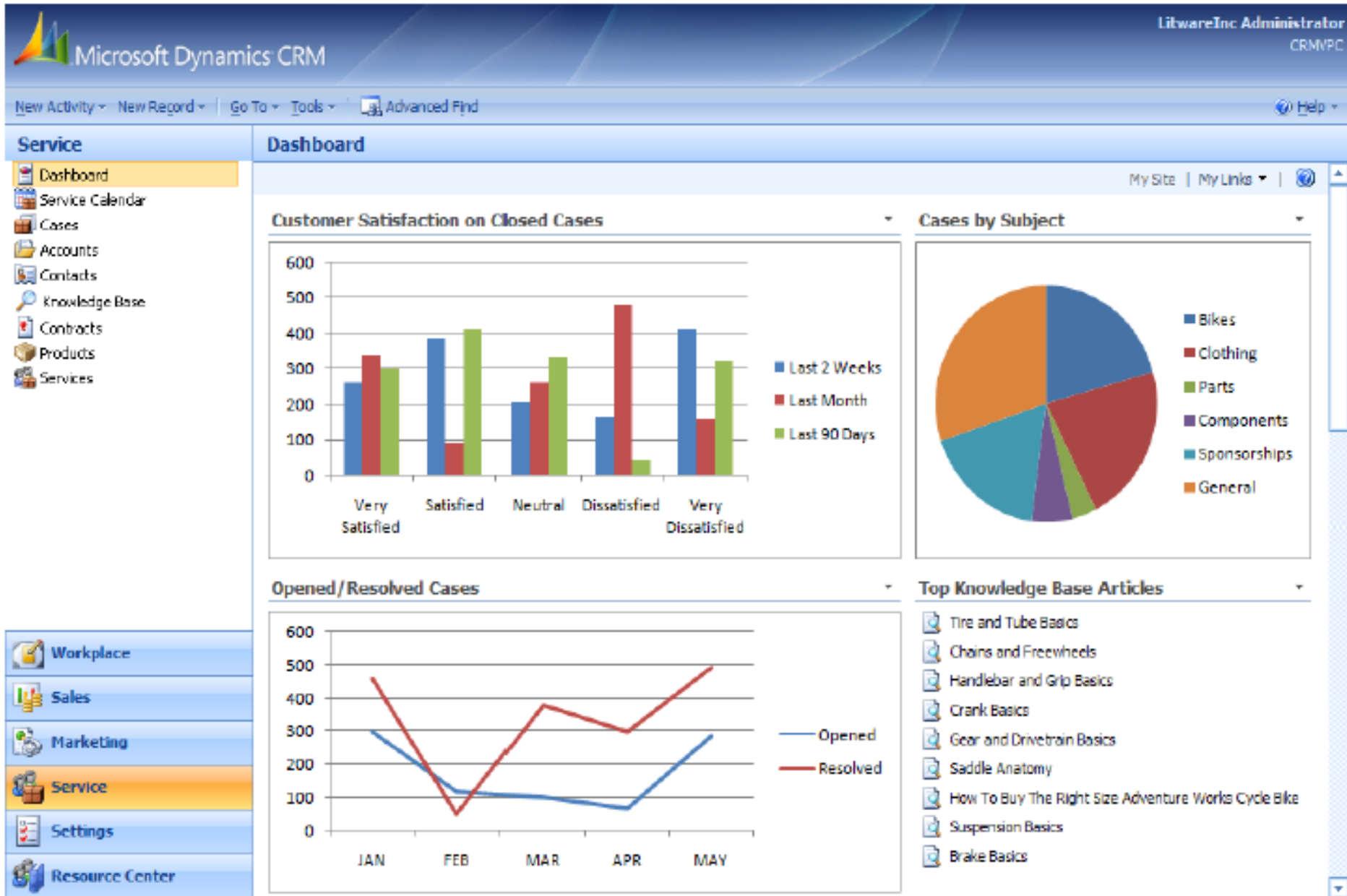
- CRM Performance Measurement (Salesforce.com)
  - Metrics for may include:
    - Cost per lead
    - Cost per sale
    - Number of repeat customers
    - Reduction of churn
    - Sales closing rate
- Customer Lifetime Value (CLTV):
  - Difference between revenues and expenses minus the cost of promotional marketing used to retain an account.

# CRM Software

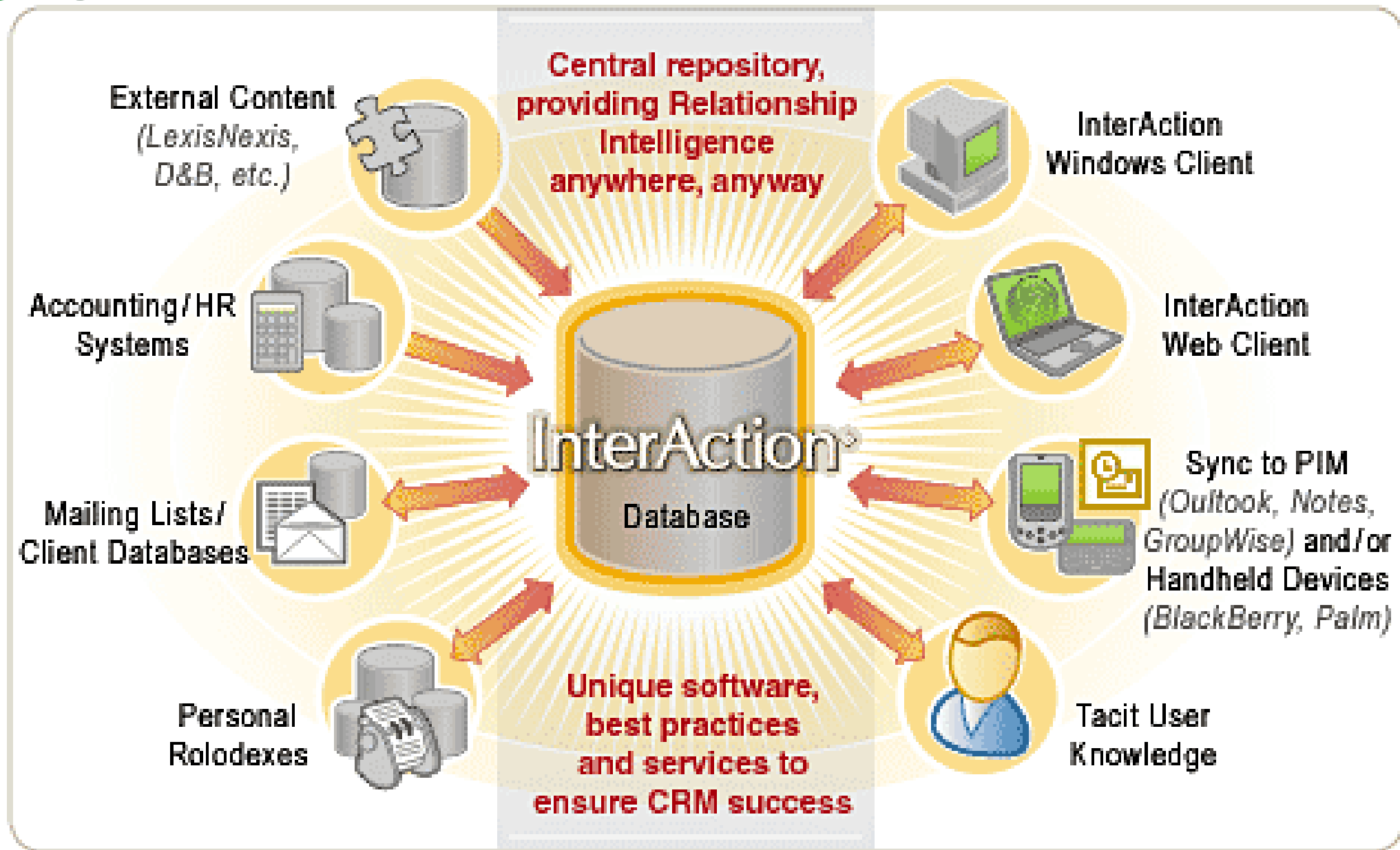
- Customer Relationship Management (CRM) Software
  - Can range from niche tools to large-scale enterprise applications
  - Can link to other major enterprise applications, such as supply chain management



# CRM Performance Measurement



# Integrated CRM Portal



# CRM Systems

- Business Value of Customer Relationship Management Systems
  - Increased customer satisfaction
  - More effective marketing and reduced direct marketing costs
  - Lower costs for customer acquisition and retention
  - Increased revenue from identifying most profitable customers and segments for marketing, cross-selling, up-selling
  - Reduced churn rate (Number of customers who stop using or purchasing products or services from a company)

# CRM Systems (con't)

- Extending Enterprise Software
  - More web-centric, so that core systems can work with extended supply chains, CRM, and new B2C and B2B e-commerce models
- Service Platforms and Business Process Management
  - Integration of multiple applications from multiple business functions, business units, or business partners to deliver a seamless experience for the customer, employee, manager, or business partner

# CRM Systems (con't)

- Business Process Management
  - A methodology for dealing with the organization's need to change its business processes continually to remain competitive
- Portals:
  - Frameworks for building composite services, integrating information from enterprise applications and in-house legacy systems



# CRM Systems (con't)

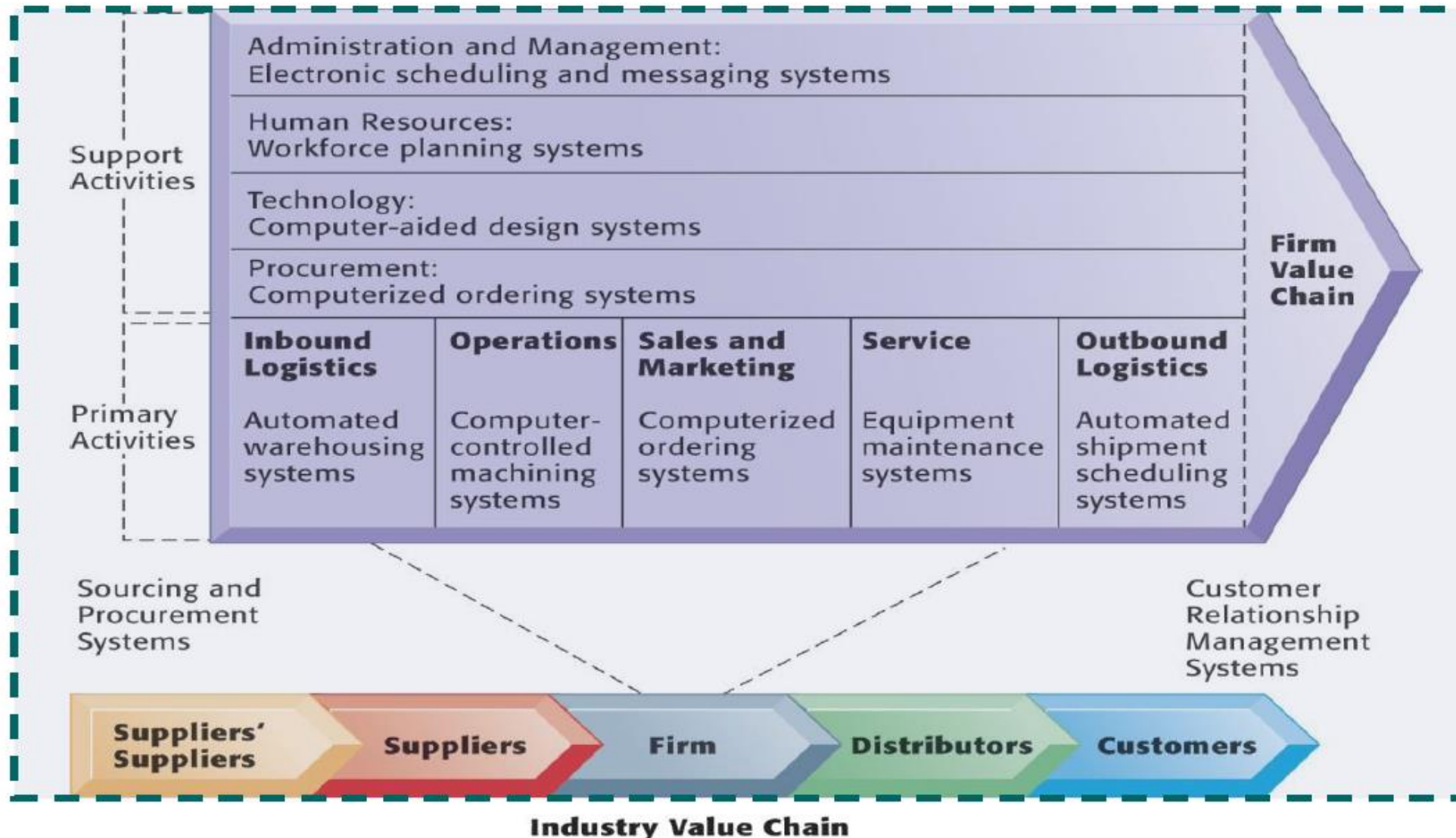
- Management Opportunities:
  - Improvement of process coordination and management decision making
  - Reductions in inventory costs, order-to-delivery time, and more efficient customer response and higher product and customer profitability
- Solution Guidelines:
  - Look at business objectives first
  - Attention to data and data management
  - Senior management commitment and employee support
  - Education and training



# Enterprise Resource Planning

# Information Systems Roles in the Value Chain

## Enterprise Resource Planning (ERP) Systems



# Enterprise Resources Planning (ERP)

## Definition

- Enterprise Resource Planning

“A method for the effective planning and controlling of ALL these sources needed to take, make, ship and account for customer orders in a manufacturing, distribution or service company.”

- Remember the evolution of MRP into ERP?

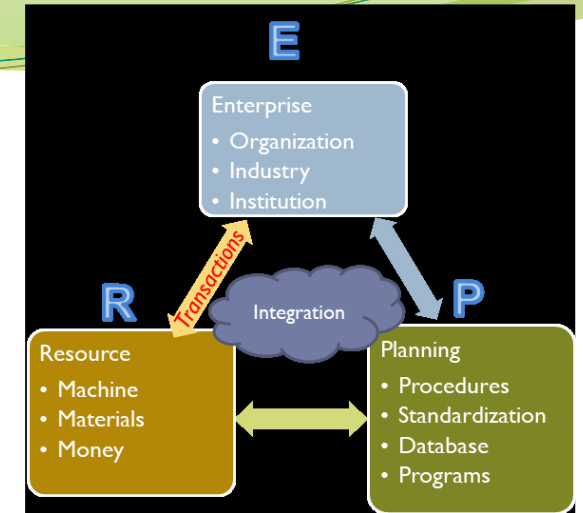
# Enterprise Resources Planning

- **Integrated Packages (Enterprise Resource Planning)**

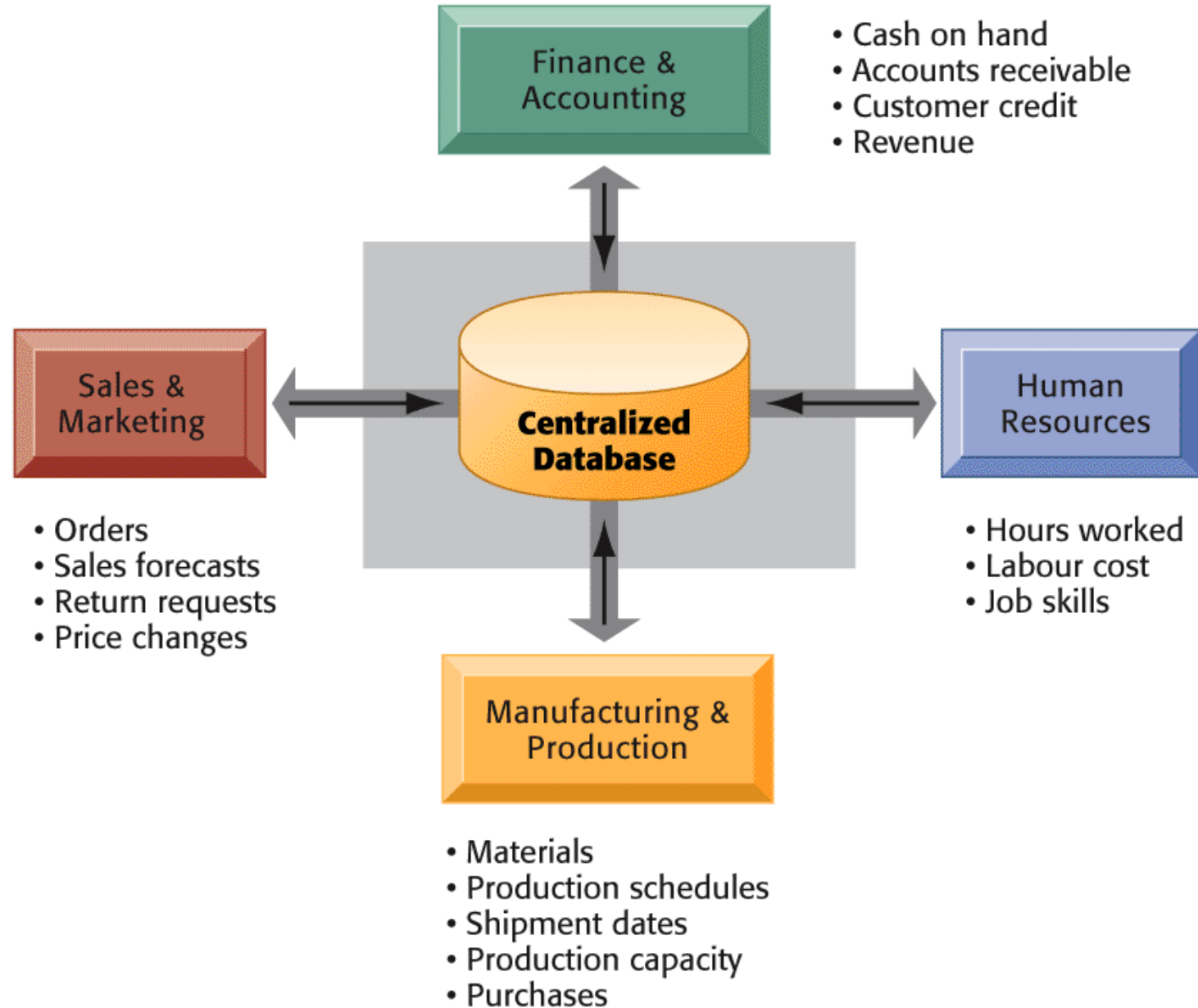
- Richly functional systems designed to support many organizational functions (e.g. accounting and finance)

- **ERP Key Characteristics**

- **Internally focused** systems designed to support the internal operations of the organization
- **Highly integrated** systems sharing a **common data warehouse** for information sharing across functions, using **real-time updates**
- **Organizational fit** may be less for individual departments but the integrated sharing of information usually outweighs these issues
- Usually **packaged applications** supported by the vendor utilizing a **common user interface**
- **Customization** is discouraged but these systems have the flexibility to support other outside applications using the common data repository and interfaces



# ERP System Architecture



# ERP Software (con't)

- Enterprise Resource Planning (ERP) systems
  - Interdependent software modules with a common central database
  - Support basic internal business processes for finance and accounting, human resources, manufacturing and production, and sales and marketing
  - Enables data to be used by multiple functions and business processes for precise organizational coordination and control

# ERP Software (con't)

- Enterprise Resource Planning (ERP) systems
  - Software is developed around predefined business processes
  - Firms select functions needed, then map to the predefined processes in the software
  - Best practices are the most successful solutions or problem-solving methods for consistently achieving an objective



# ERP Software SAP

- Based in Germany, now worldwide
- Support for international transactions and multinational firms
- Runs on multiple database and hardware platforms
- Can handle large and small companies
- Expensive, but price is relative.
- Financials
- Logistics
- Human resource management



# ERP Capabilities – SAP Example

- Business Analysis
  - Evaluate business performance through functionality for analyzing workforce, operations, and supply chain
- Financial and Management accounting
  - Manage corporate finance functions by automating financial supply chain management, financial accounting, and management accounting
- Human Capital Management
  - Tools to maximize the profitability potential of workforce, with functionality for employee transaction management, and employee lifecycle management

# ERP Capabilities – SAP Example (con't)

- Corporate Services Management
  - Optimize centralized and decentralized services for managing real estate, corporate travel, and incentives, and commissions.
- Self-Services
  - Employee-centric portal that enables both employees and managers to create, view, and modify key information. Uses a broad range of interaction technologies, including web browser, voice, and mobile devices for easy access to internal and external business content, application, and services.

# ERP Software

- Business Value of Enterprise Systems
  - A more uniform organization (What is SAP)
  - More efficient operations and customer-driven business processes
  - Firm-wide information for improved decision making (SAP – Building loyalty with your Most Profitable Shoppers)
  - Enterprise Mobile Functionality (How E-Commerce is Changing the Shopping Experience)

# ERP Software

- Issues and Challenges in Implementing ERP Systems:
  - Business must align processes to the ERP system
  - ERP systems cross organizational boundaries
  - ERP systems may also cross inter-organizational boundaries

# ERP Strategy Considerations

- High initial Cost
- High cost to maintain
- Future upgrades
- Training

# Choosing an ERP System – Selection Factors

- **Control** refers to where the power lies related to computing and decision support systems (centralized vs. decentralized) in selecting systems, developing policies and procedures, etc. (Who will decide?)
- **Business Requirements** refers to the system's capabilities and how they meet organizational needs through the use of **software modules** or groups of business functionality (What do you need?)
- **Best Practices** refers to the degree to which the software incorporates **industry standard methods** for doing business which can cause a need for significant **business processes reengineering** (How much change is required?)

# Choosing an ERP System – Selection Factors

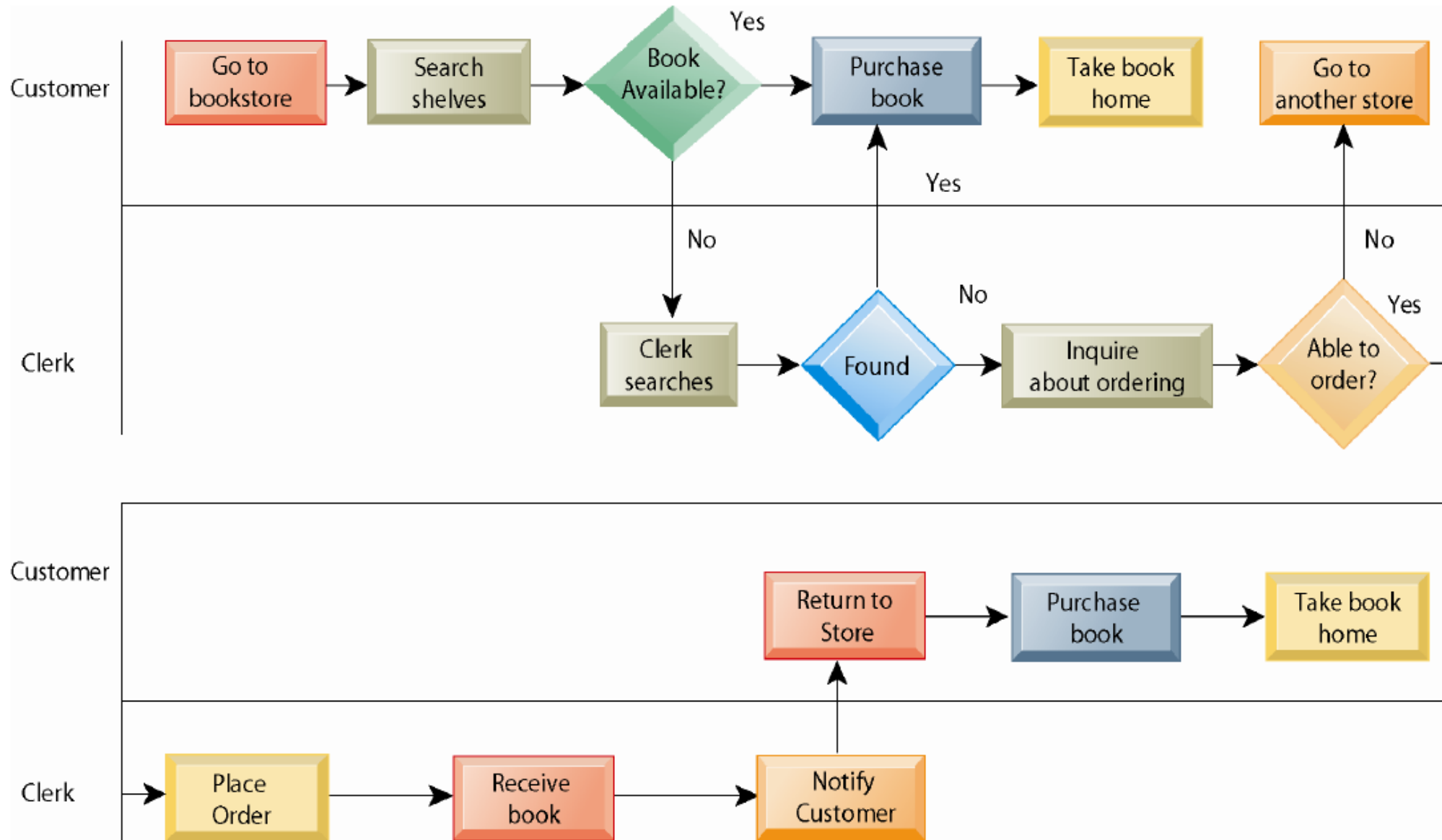
- Technology alone is often not enough to make companies more efficient, competitive, or quality oriented.
- Organizational changes are often necessary, from minor changes in work habits to redesigning entire business processes
- BPM: Business process management
  - Aims to continuously improve processes
  - Uses variety of tools and methodologies to:
    - Understand existing processes
    - Design and optimize new processes



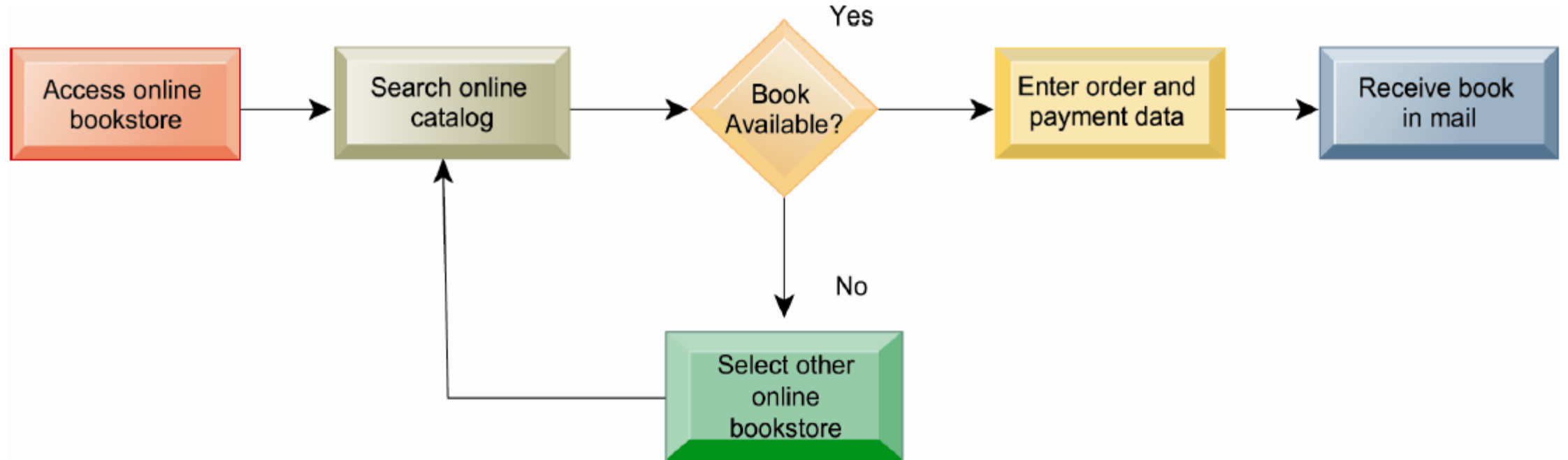
# Choosing an ERP System - BPM

- Steps in BPM
  1. Identify processes for change
  2. Analyze existing processes.
  3. Design new process.
  4. Implement new process.
  5. Continuous measurement.

# Choosing an ERP System - BPM



# Choosing an ERP System - BPM



# Recommendations for Enterprise System Success

## **Secure Executive Sponsorship**

The highest level support is required to obtain resources and make and support difficult reengineering decisions

## **Get Help from Outside Experts**

Implementation success is enabled by deep application experience and access to supporting tools and methods

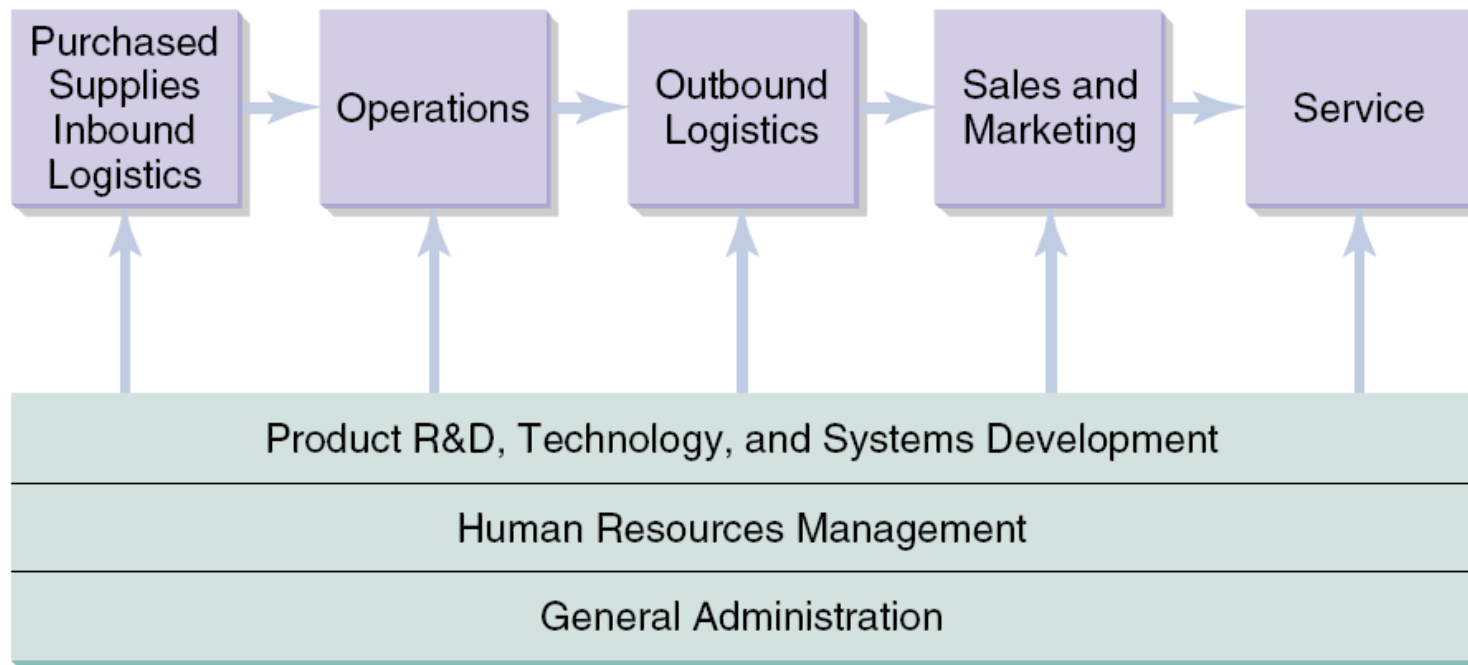
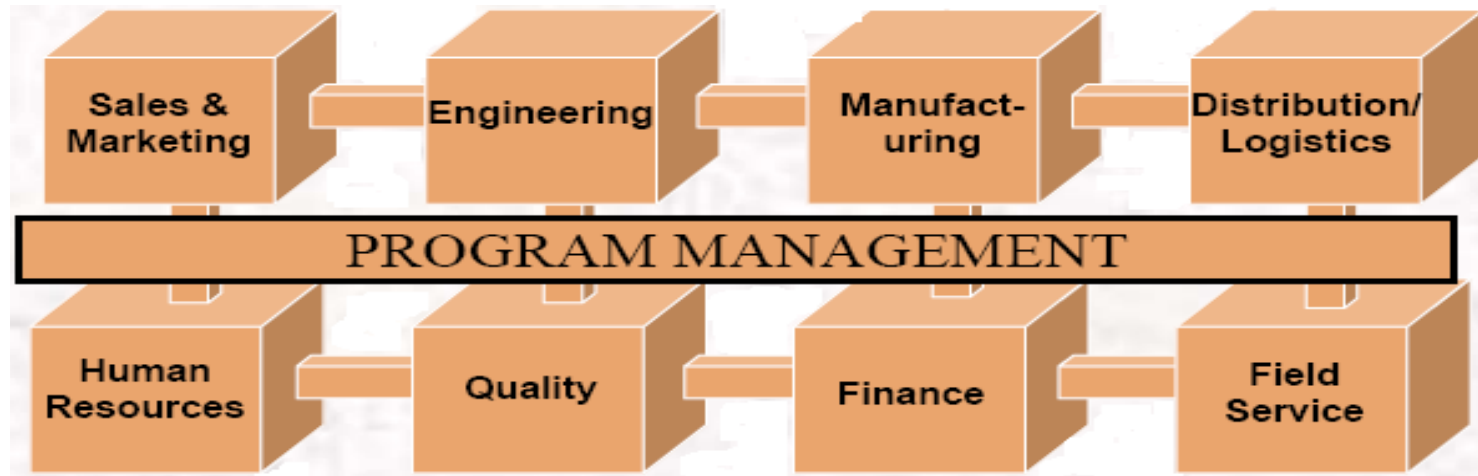
## **Thoroughly Train Users**

Training in organization, business process, and application functions is critical to success and must be reinforced

## **Take a Multidisciplinary Approach to Implementations**

Enterprise systems span the entire organization and as such require input and participation from all functions

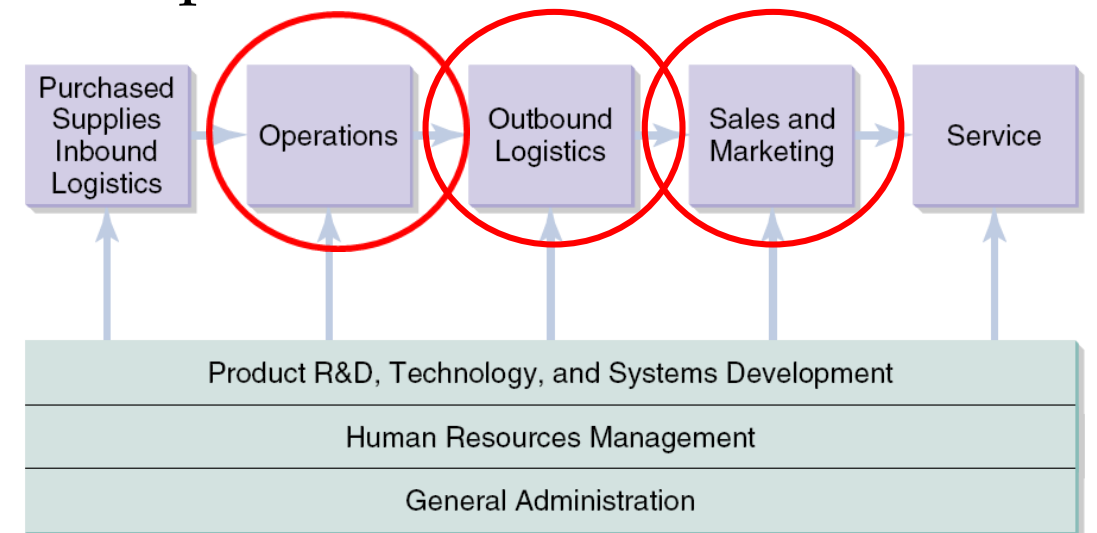
# Typical ERP Functionality - Value Chain



# Sales and Operations Planning



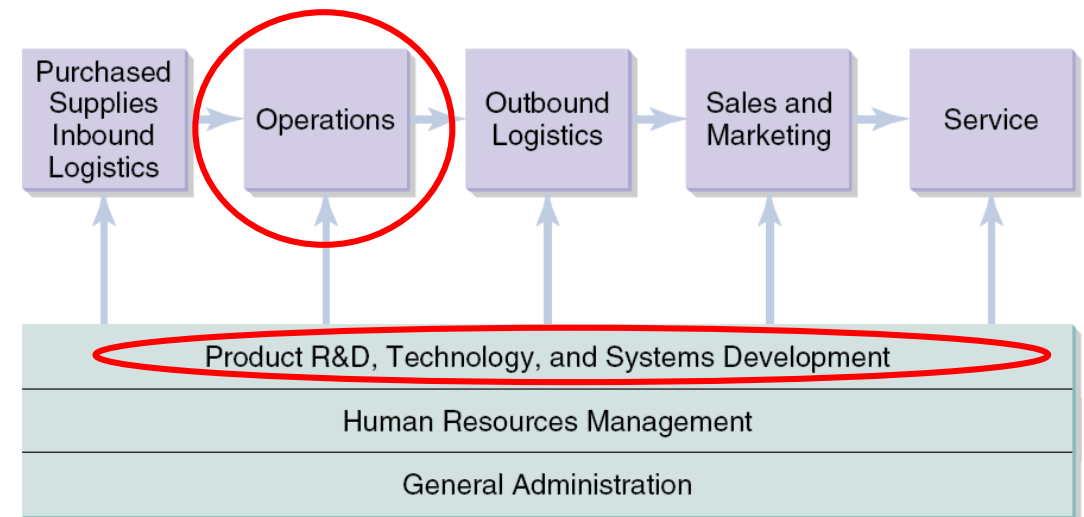
- Balance market demand with resource capability
- Develops a contract between Manufacturing and Marketing
- A single set of numbers upon which to base plans and schedules
- Manages Inventory and Backlog
- Forecasting



# Engineering



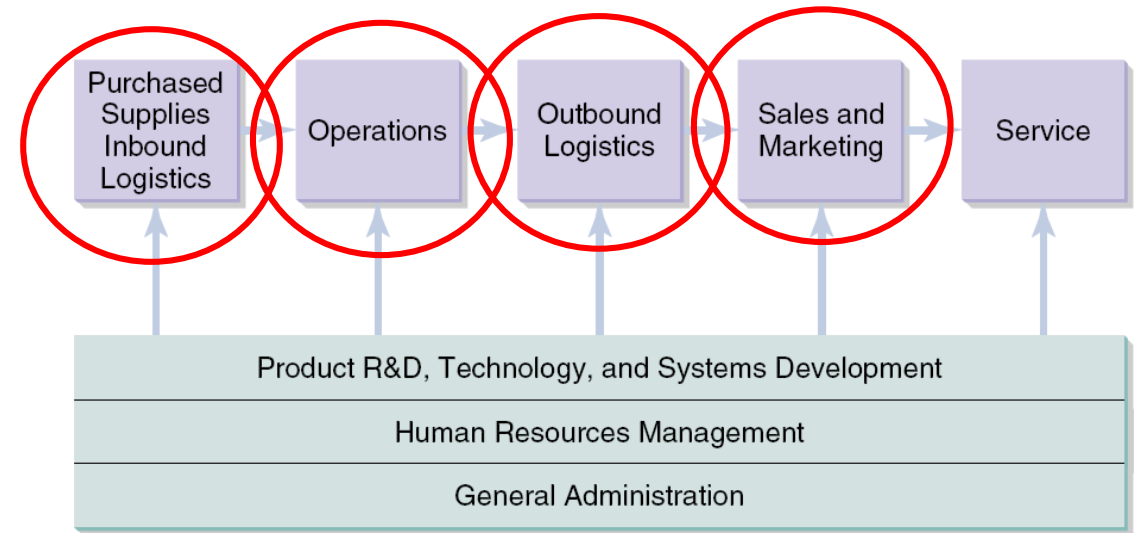
- Document Creation, Management & Control
- CAD Interface / Image Management
- Configuration Management
  - Change Order Creation & Control
  - Revision Control
- Engineering Data Management
- Product Information Management
- Technical Data Management
- Technical Information Management
- Engineering Item Data & BOMs



# Manufacturing



- MRPII Functionality
  - MPS, BOM, Routings, MRP, CRP
- Integrated Production Configuration
- Statistical Inventory Control
- Sales & Operations Planning
- Flexible Product & Job Costing Options
- Kanban / JIT / Flow Manufacturing Support
- Advanced Planning Systems

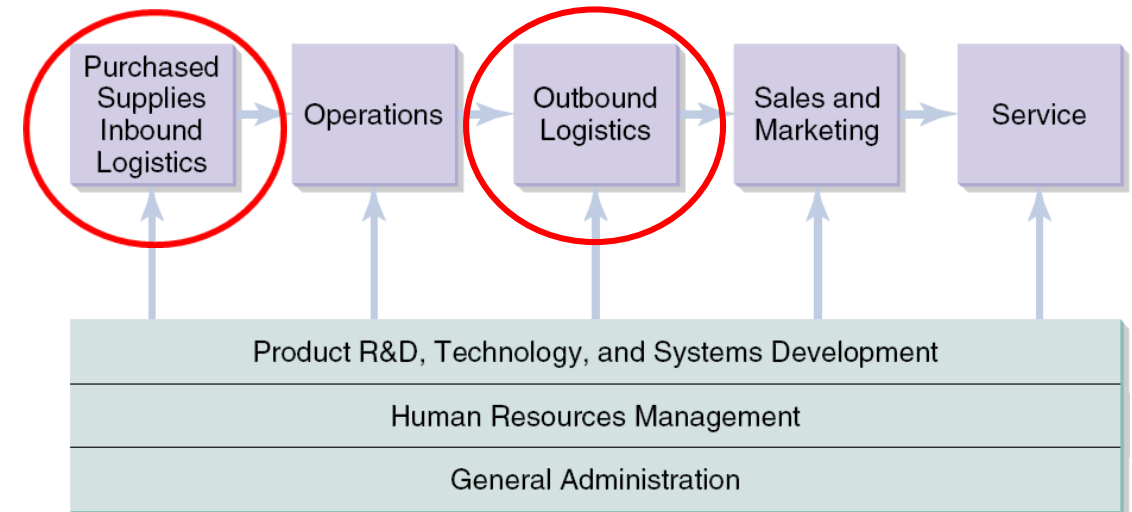




# Distribution / Logistics



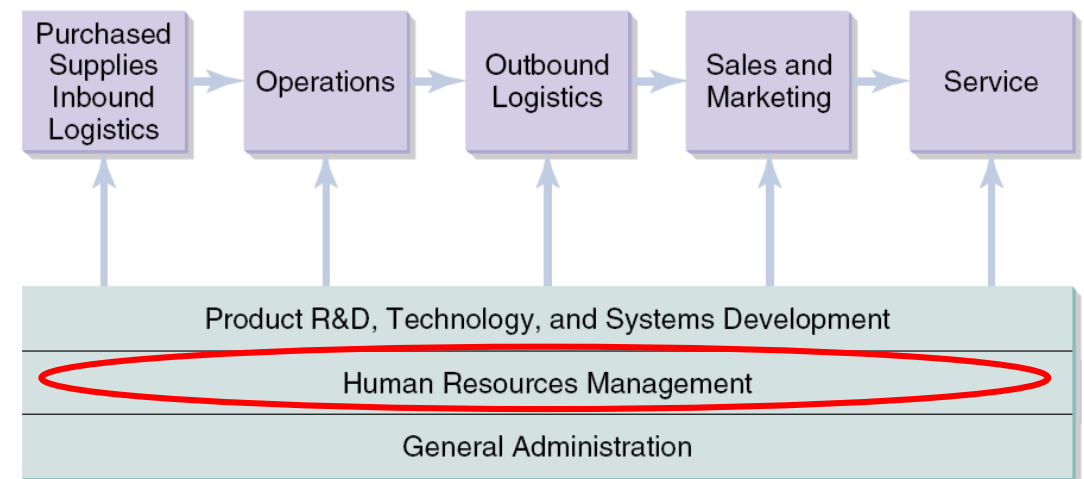
- Purchasing
- Supplier Reliability Analysis
- Distribution Requirement Planning
- Global Transportation Management
- Fleet Management
- Shipping & Receiving
- Import / Export
- Warehouse Management



# Human Resources



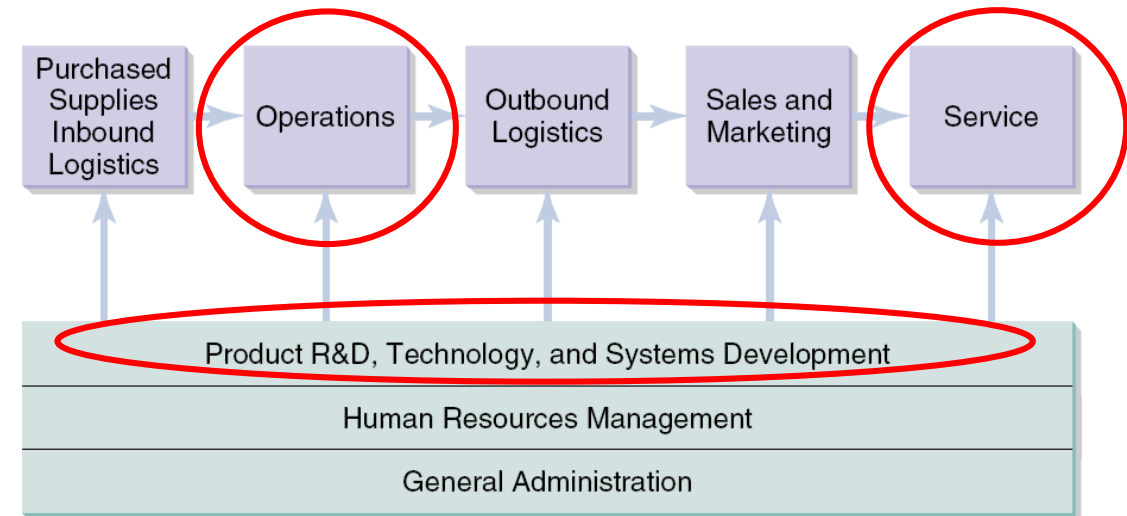
- Requisition Management
- Applicant Tracking
- Employee Master
- Job Descriptions
- Employee Evaluations
- Training & Certification Management
- Payroll Deduction Accounting
- Benefits Tracking



# Quality



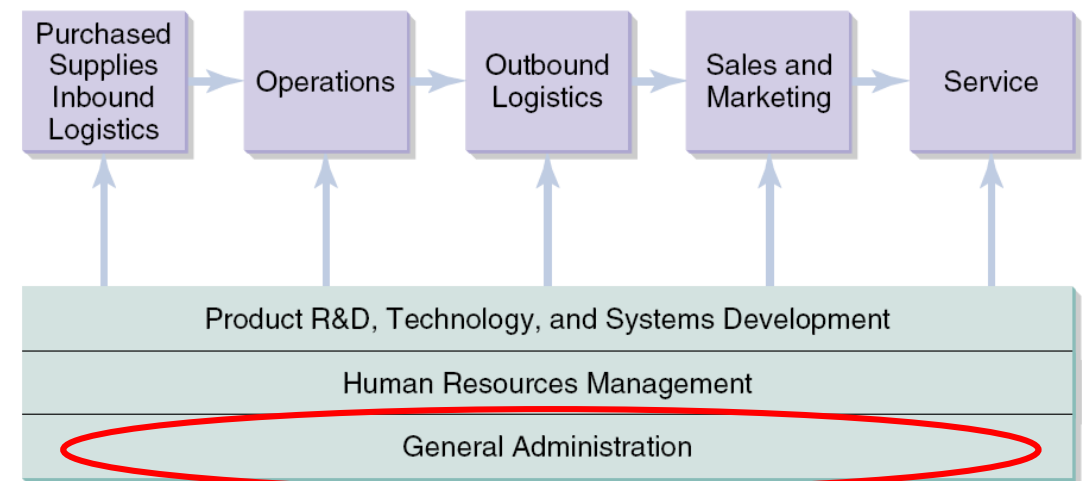
- Quality Management Plans
- Quality Specifications / Requirements
- Test / Inspection Results
- Cause and Corrective Action Tracking
- Process / Product Certification
- Statistical Quality Control
- Cost of Quality Reporting
- Equipment & Tool Calibration



# Finance



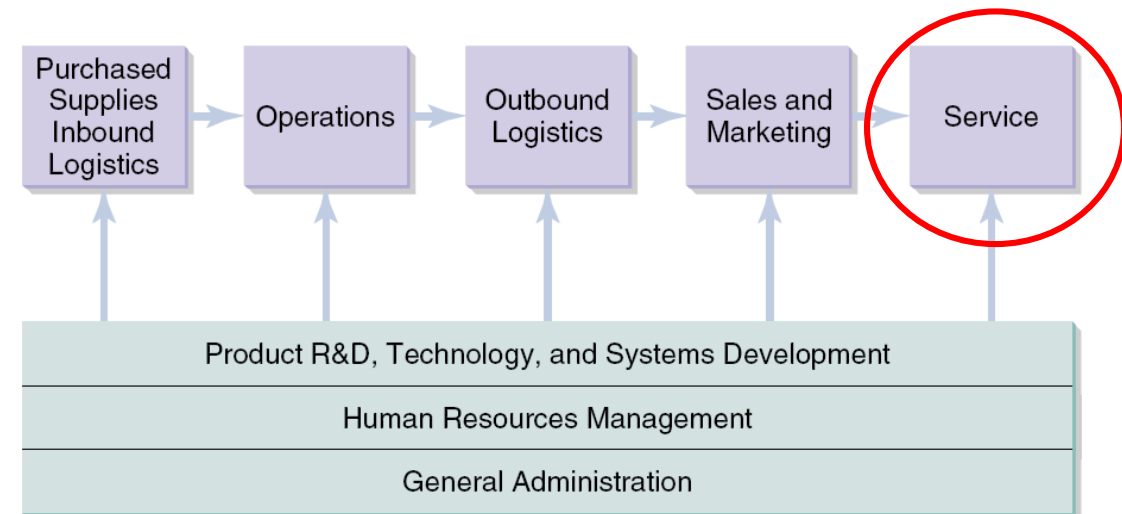
- Financial Budgets
- General Ledger
- Accounts Payable
- Accounts Receivable
- Payroll
- Fixed Assets
- Cash Management
- Activity Based Costing
- Financial Statements



# Field Service



- Installation Management
- As-maintained BOM (Bill of Materials)
- Warranty Tracking
- Preventative Maintenance Scheduling & Control
- Service Order Planning & Control



# Enterprise Information Systems

End of Lecture 6