ACS-1803 Introduction to Information Systems

Instructor: Kevin Robertson

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

- **An Enterprise System is central to an organization**
  - Ensures 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
  - Organisations create value by performing activities at a lower cost or enhancing differentiation of products and services
- Information systems streamline the processing of those activities
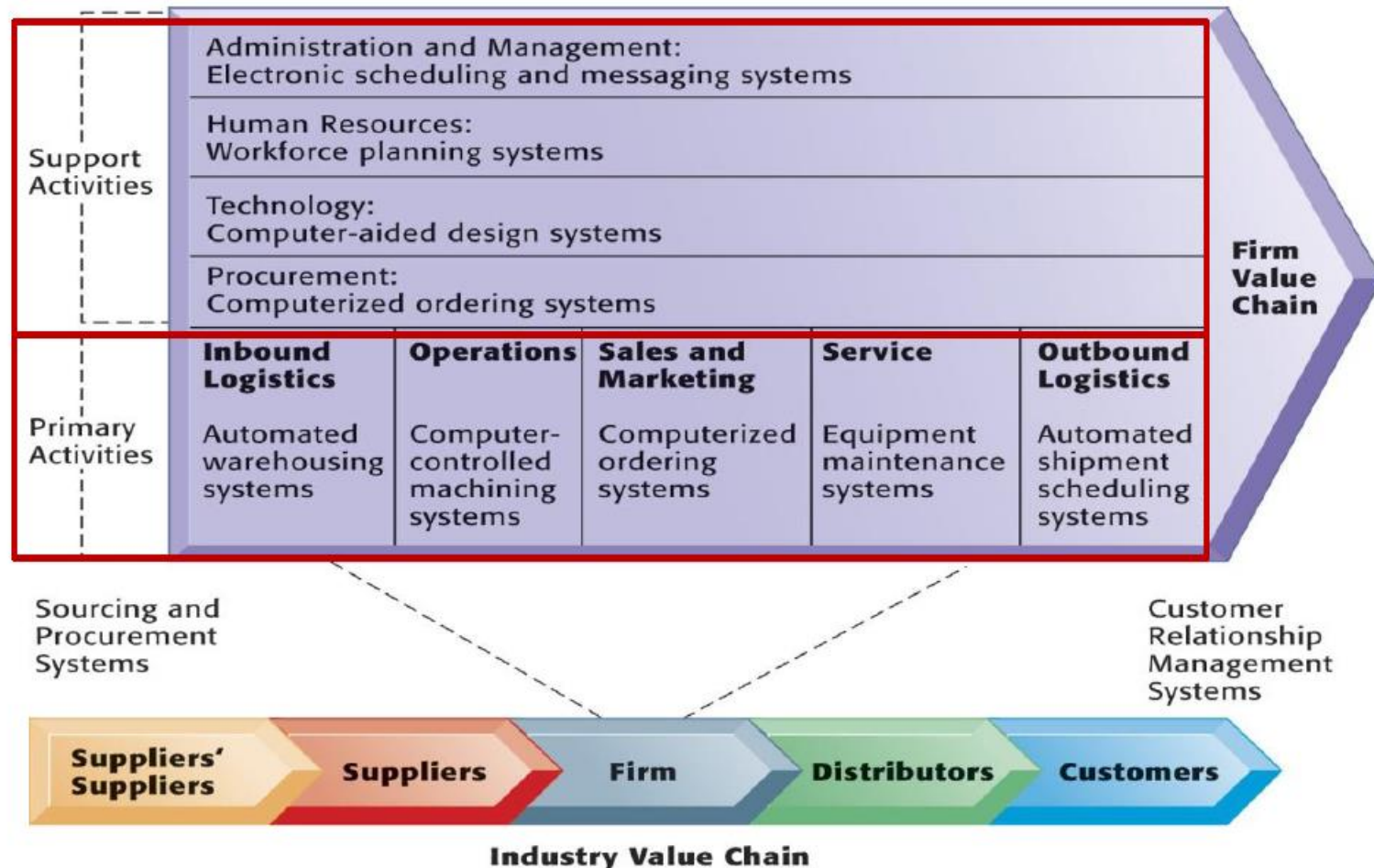
Business Value Chain

No one way to link operating indicators to mid-tier service indicators, e.g. queue depth, message latency, process hang-ups

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

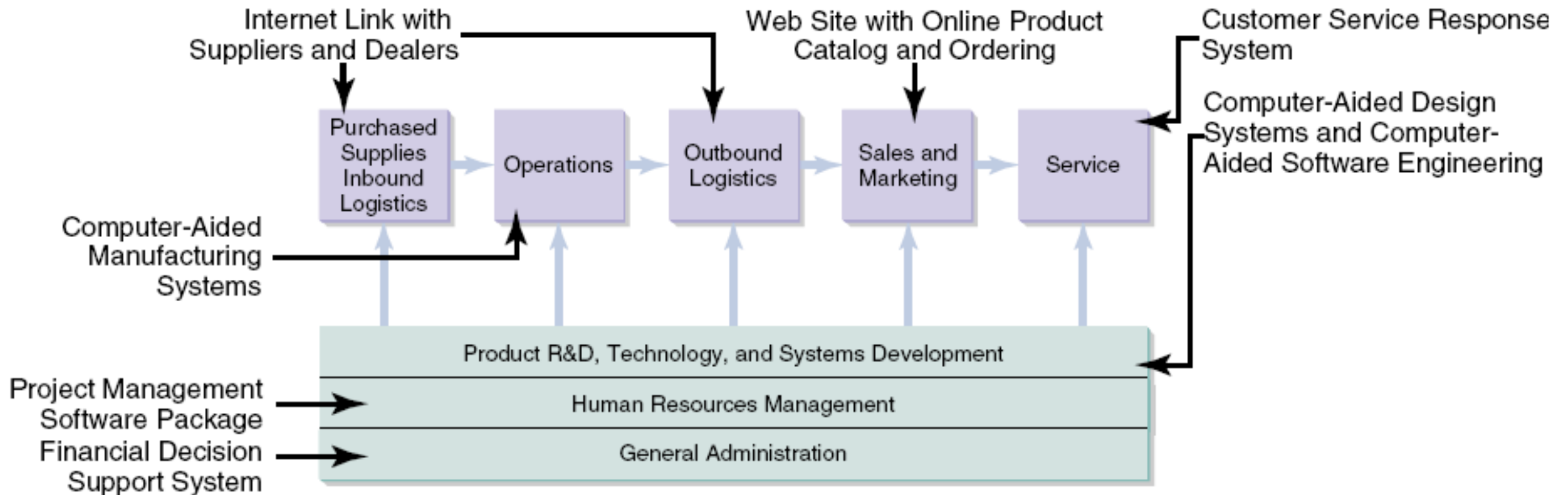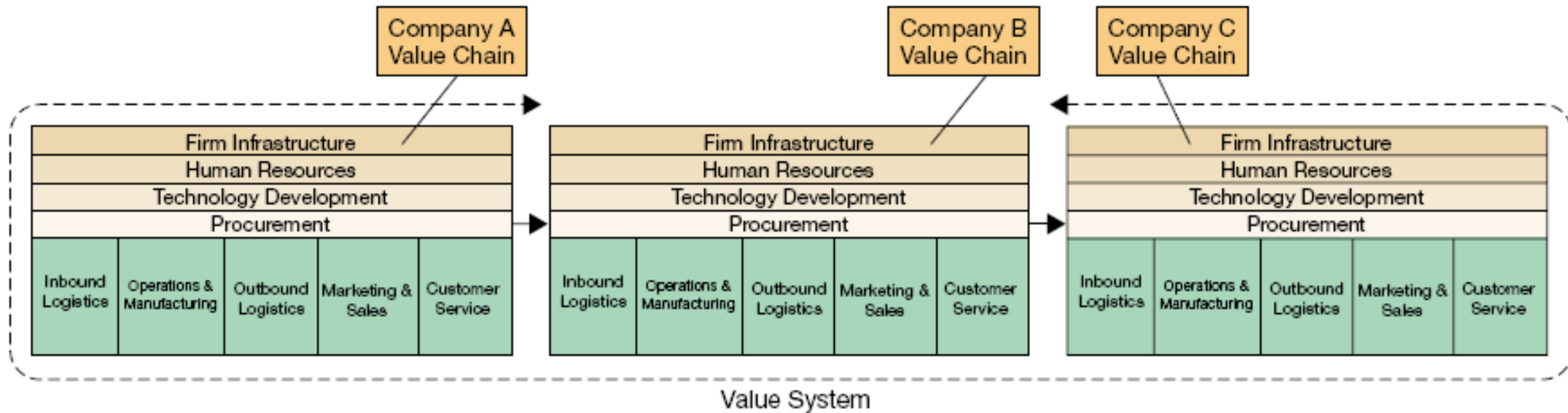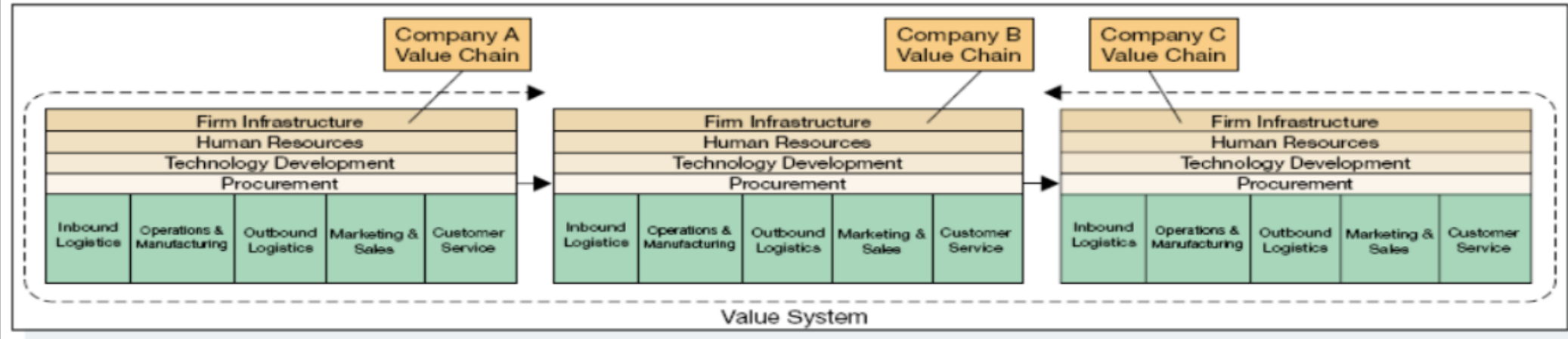# Information Systems Roles in the Value Chain

Figure 2.6 ➥ Sample value chain and corresponding sample uses of information systems to add value.
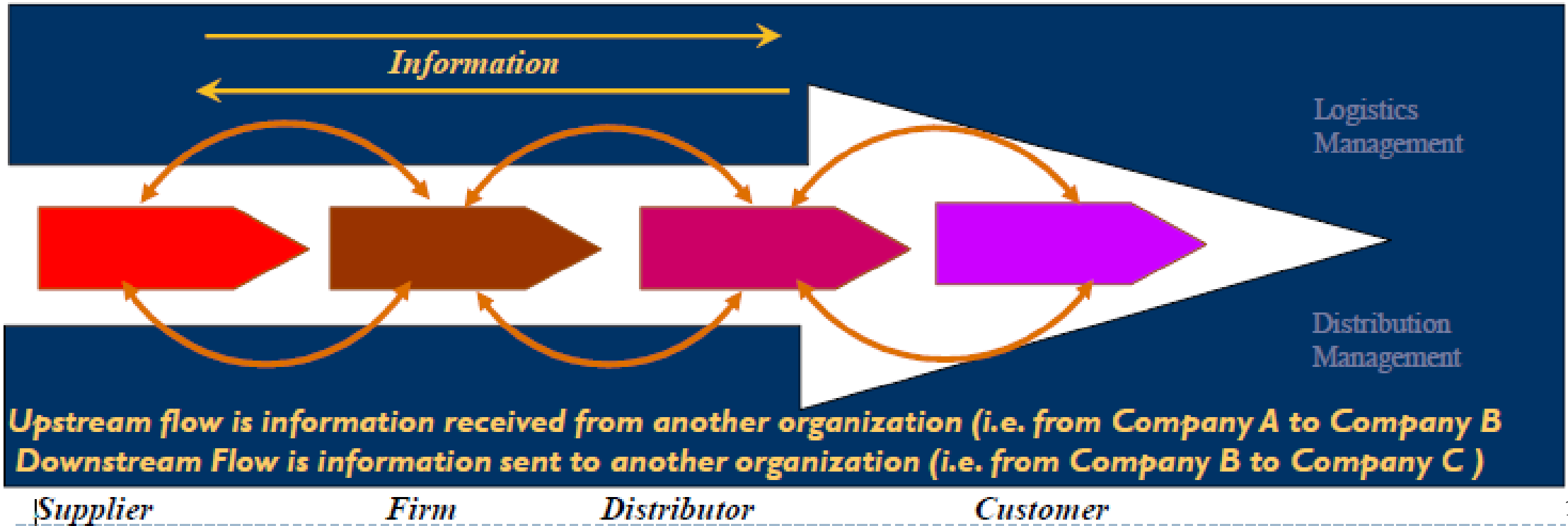
A Business Value System – Organizational Focus

Value System

A Business Value System – Organizational Focus

Moving the product efficiently from supplier to customer

Upstream flow is information received from another organization (i.e. from Company A to Company B
Downstream Flow is information sent to another organization (i.e. from Company B to Company C)

Supplier   Firm   Distributor   Customer

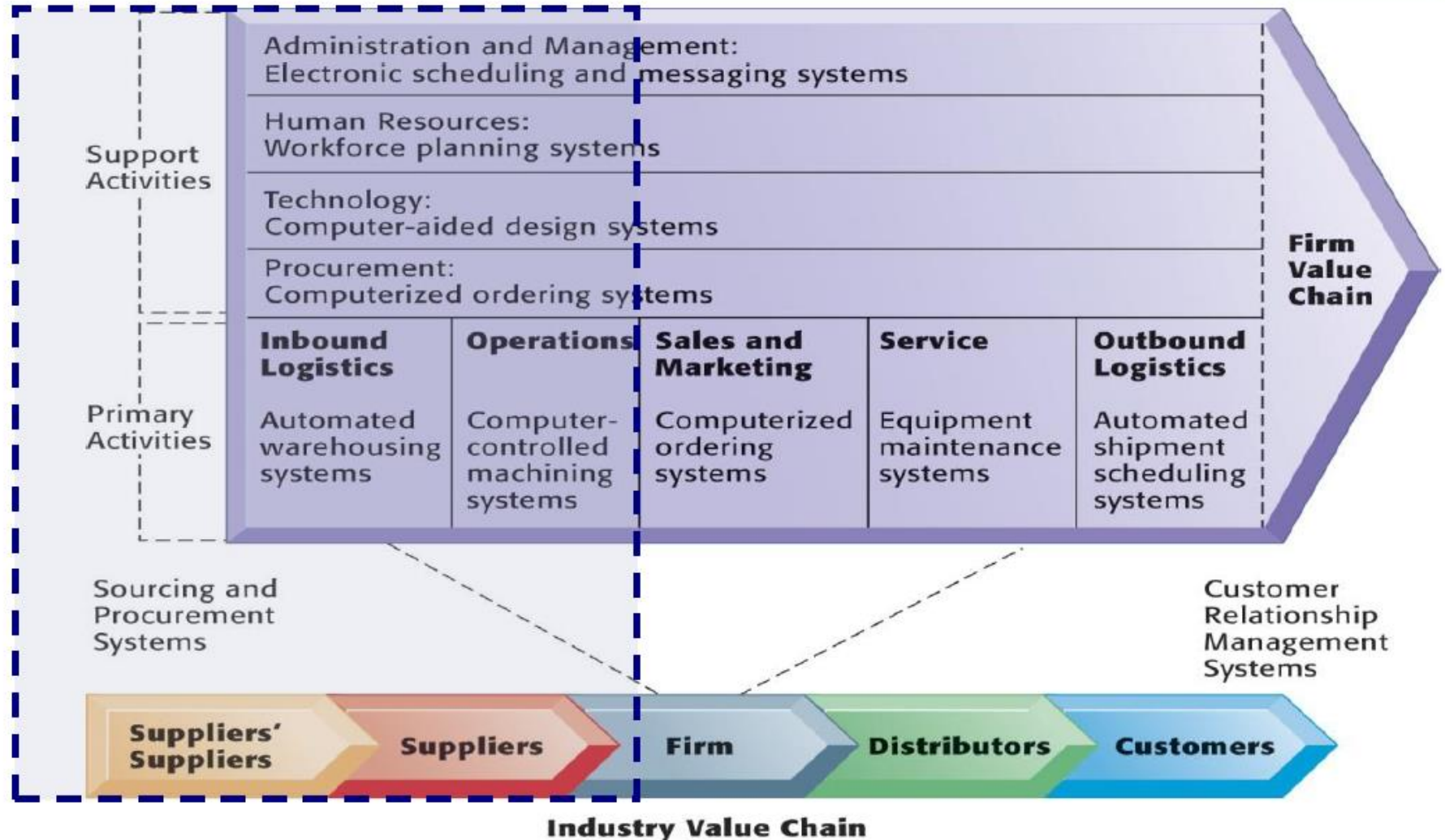# A Business Value System – Organizational Focus (con't)
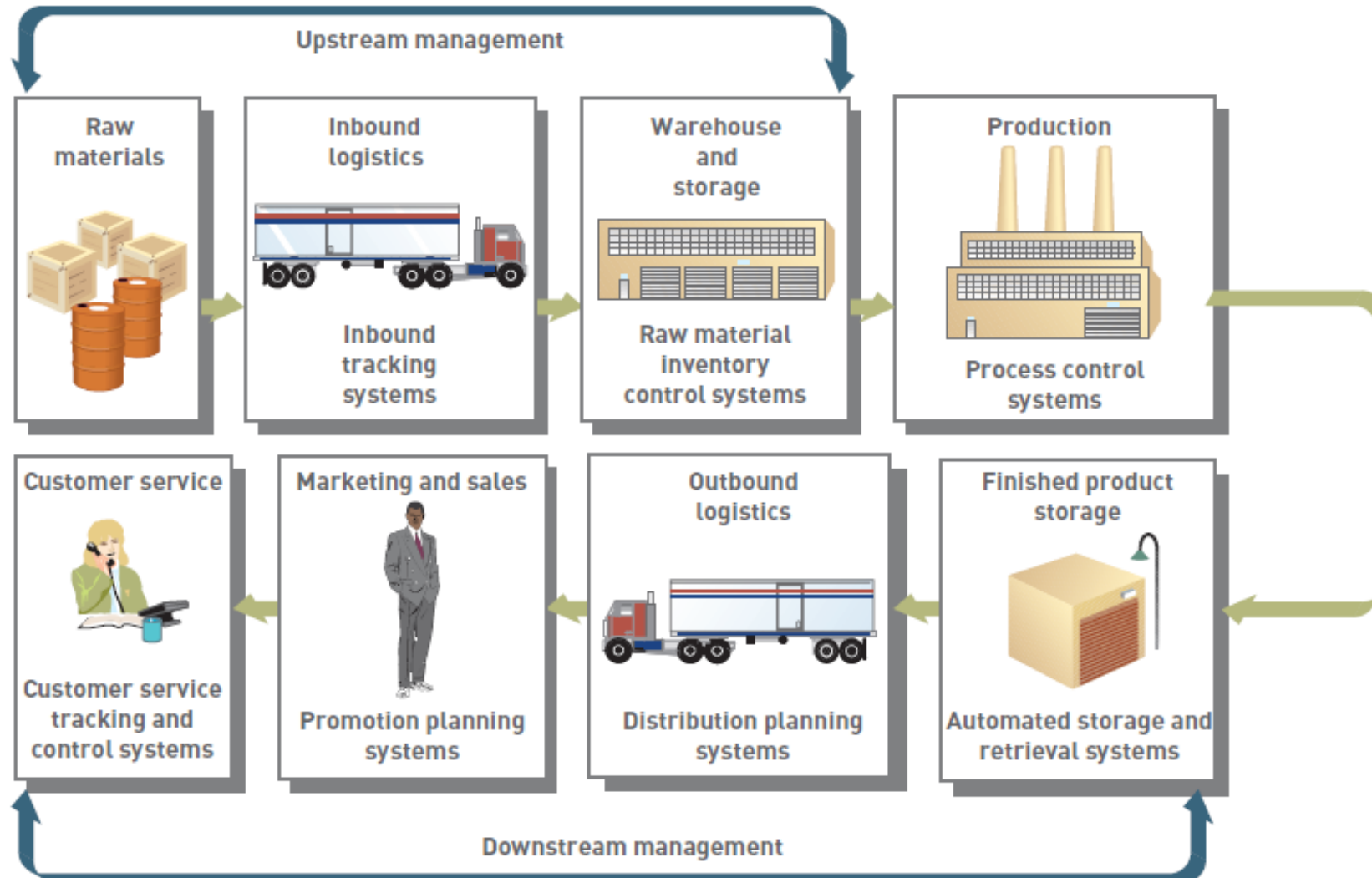
Supply Chain Management (SCM) Systems

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

	Administration and Management: Electronic scheduling and messaging systems				
Support Activities	Human Resources: Workforce planning systems				
	Technology: Computer-aided design systems				
	Procurement: Computerized ordering systems				
	Inbound Logistics	**Operations**	**Sales and Marketing**	**Service**	**Outbound Logistics**
Primary Activities	Automated warehousing systems	Computer-controlled machining systems	Computerized ordering systems	Equipment maintenance systems	Automated shipment scheduling systems

Firm Value Chain

Sourcing and Procurement Systems

Customer Relationship Management Systems

Suppliers' Suppliers → Suppliers → Firm → Distributors → Customers

Industry Value Chain

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)

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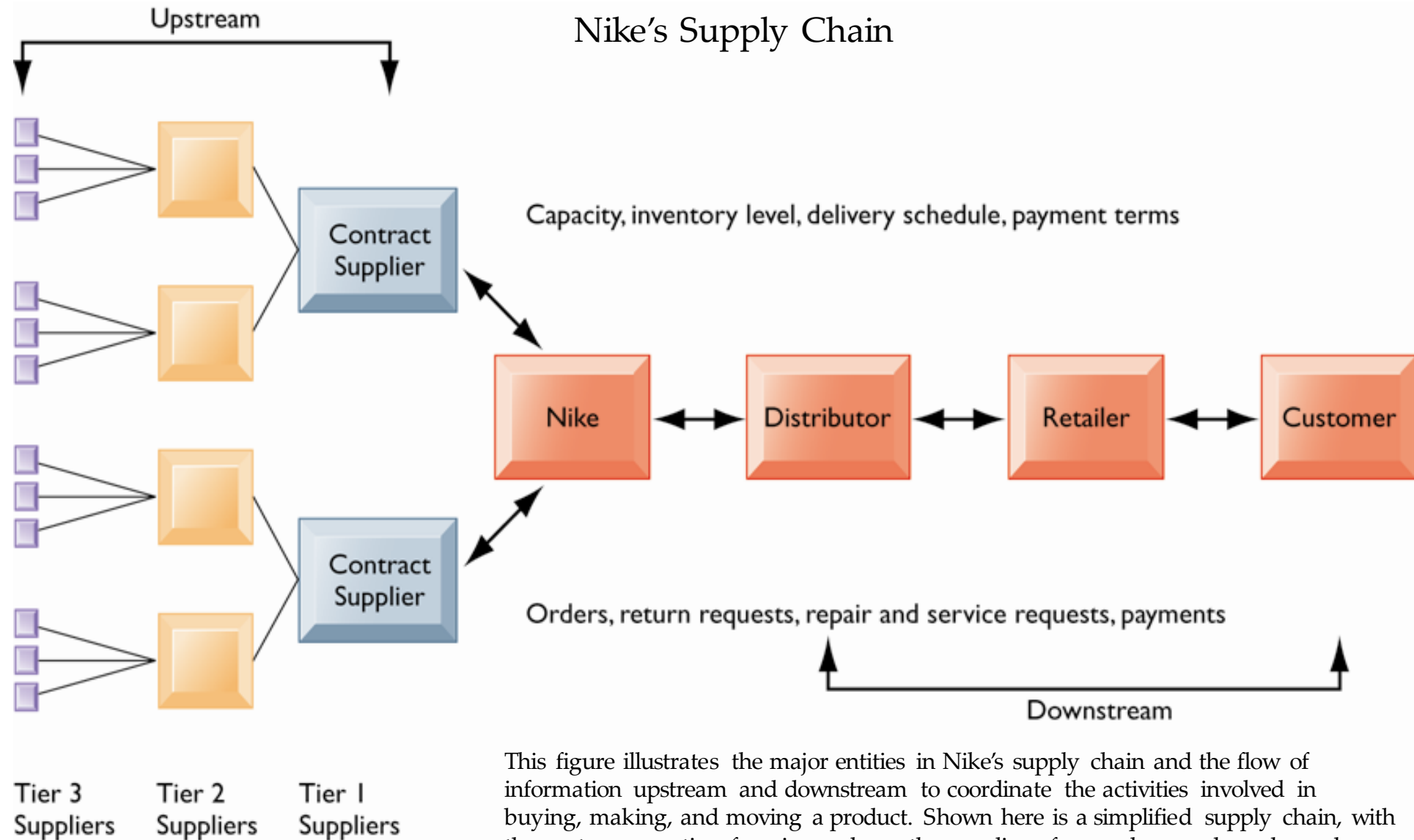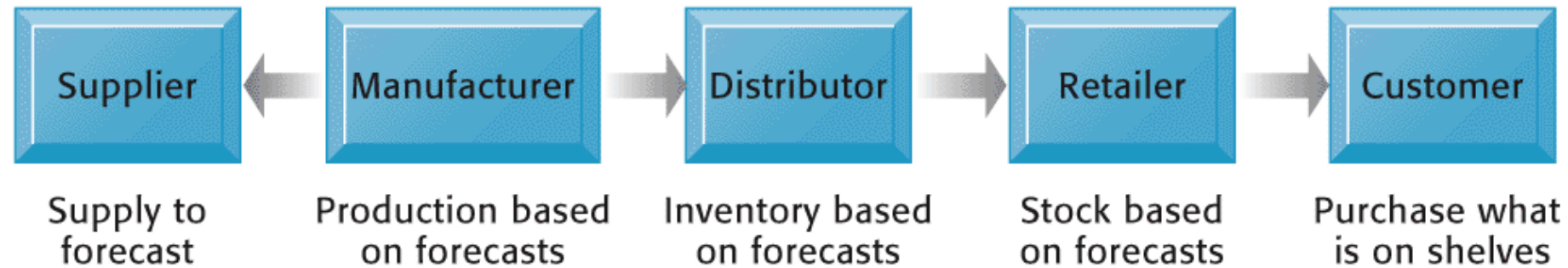
Nike's Supply Chain

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 soles.

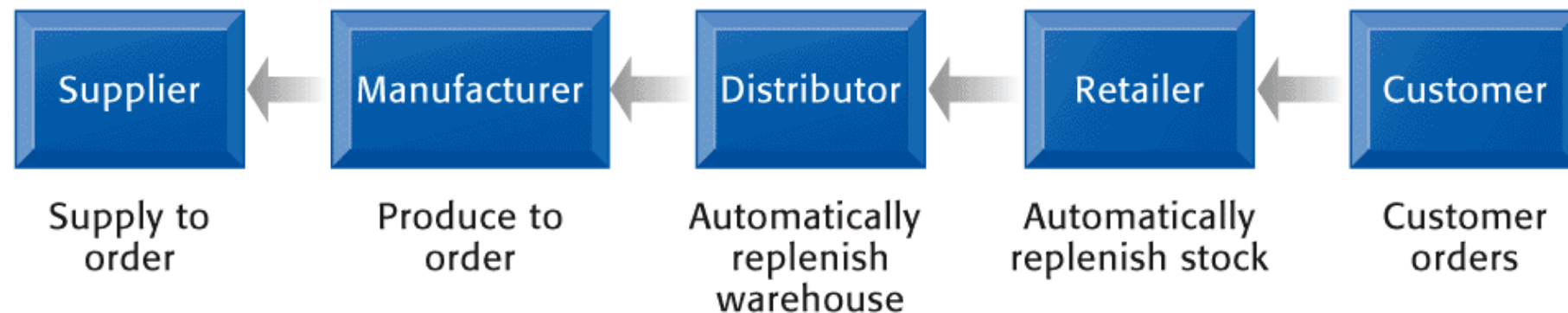17

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)

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Supply Network - PUSH vs PULL Models

Push-Based Model

Supplier	→	Manufacturer	→	Distributor	→	Retailer	→	Customer
Supply to forecast		Production based on forecasts		Inventory based on forecasts		Stock based on forecasts		Purchase what is on shelves

Pull-Based Model

Supplier	←	Manufacturer	←	Distributor	←	Retailer	←	Customer
Supply to order		Produce to order		Automatically replenish warehouse		Automatically replenish stock		Customer orders

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
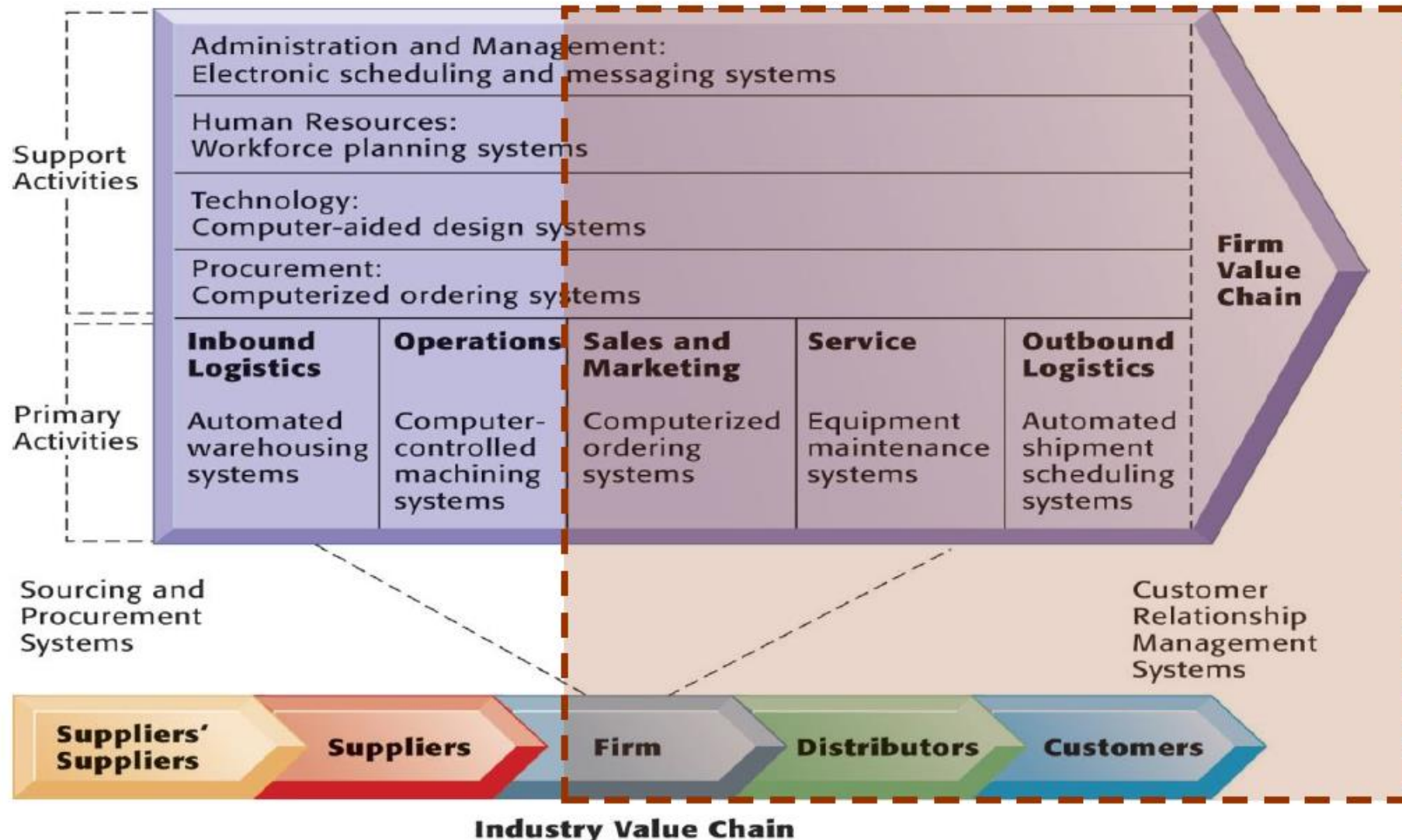
Customer Relationship Management (CRM) Systems

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

Support Activities

Administration and Management:
Electronic scheduling and messaging systems

Human Resources:
Workforce planning systems

Technology:
Computer-aided design systems

Procurement:
Computerized ordering systems

Primary Activities

Inbound Logistics	Operations	Sales and Marketing	Service	Outbound Logistics
Automated warehousing systems	Computer-controlled machining systems	Computerized ordering systems	Equipment maintenance systems	Automated shipment scheduling systems

Firm Value Chain

Sourcing and Procurement Systems

Customer Relationship Management Systems

Suppliers' Suppliers → Suppliers → Firm → Distributors → Customers

Industry Value Chain

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.

Sales
- Telephone sales
- Web sales
- Retail store sales
- Field sales

Customer

Marketing
- Campaign data
- Content
- Data analysis

Service
- Call center data
- Web self-service data
- Wireless data

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
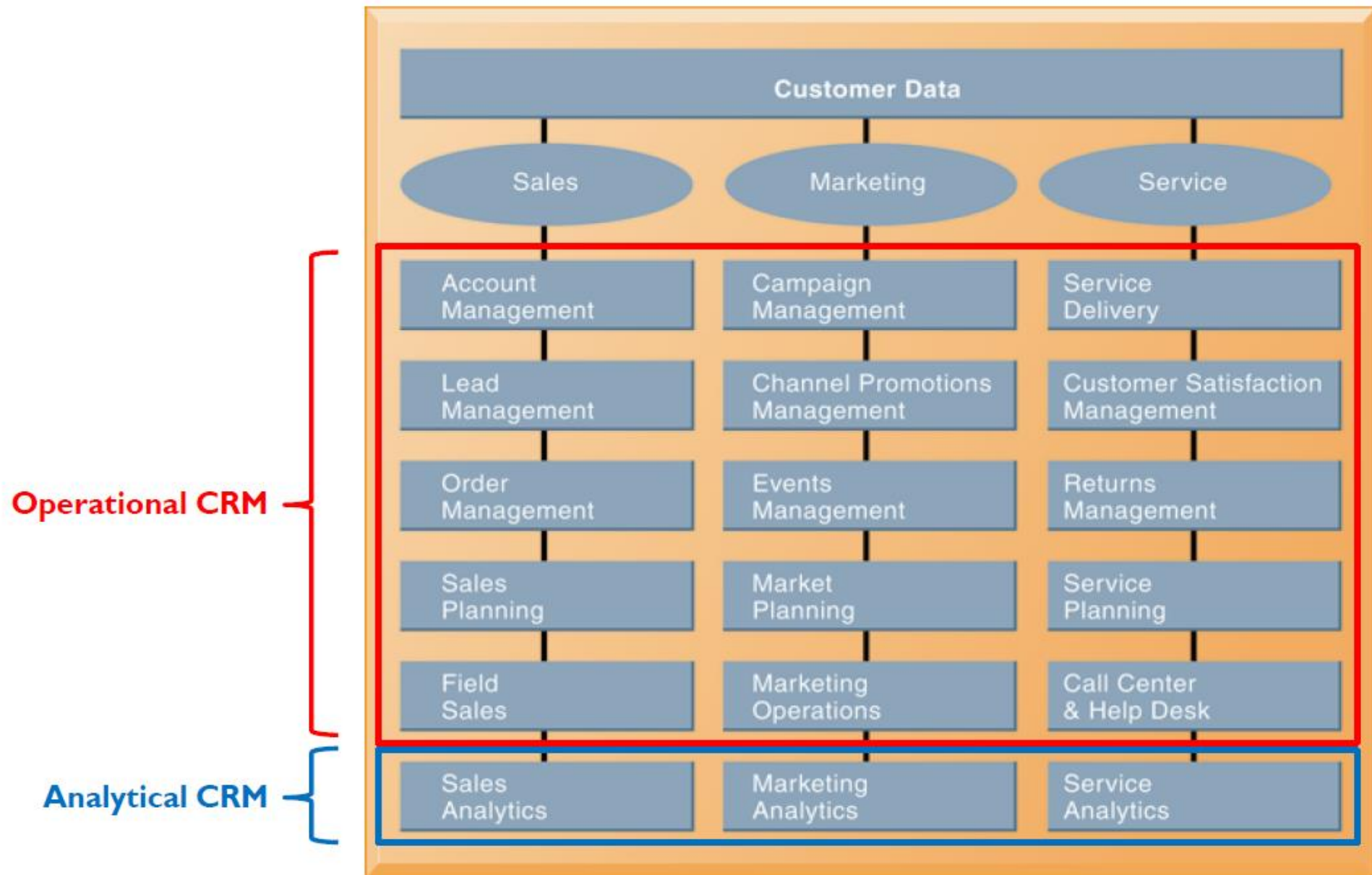
Operational and Analytical CRM

- 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

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

Operational CRM Systems

Customer Loyalty Management Process Map

FIGURE 14-13 Customer loyalty management process map
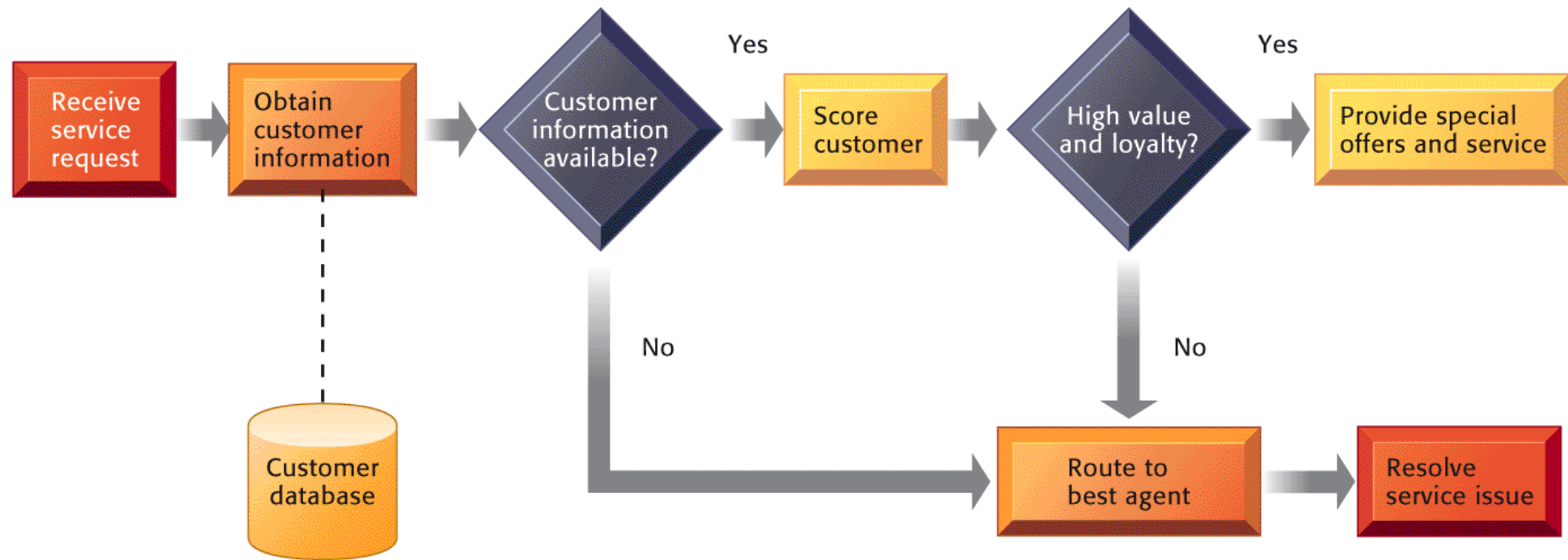
This process map shows how a best practice for promoting customer loyalty through customer service would be modelled by customer relationship management software. The CRM software helps firms identify high-value customers for preferential treatment.

Analytical CRM Systems

FIGURE 14-14 *Analytical CRM data warehouse.*
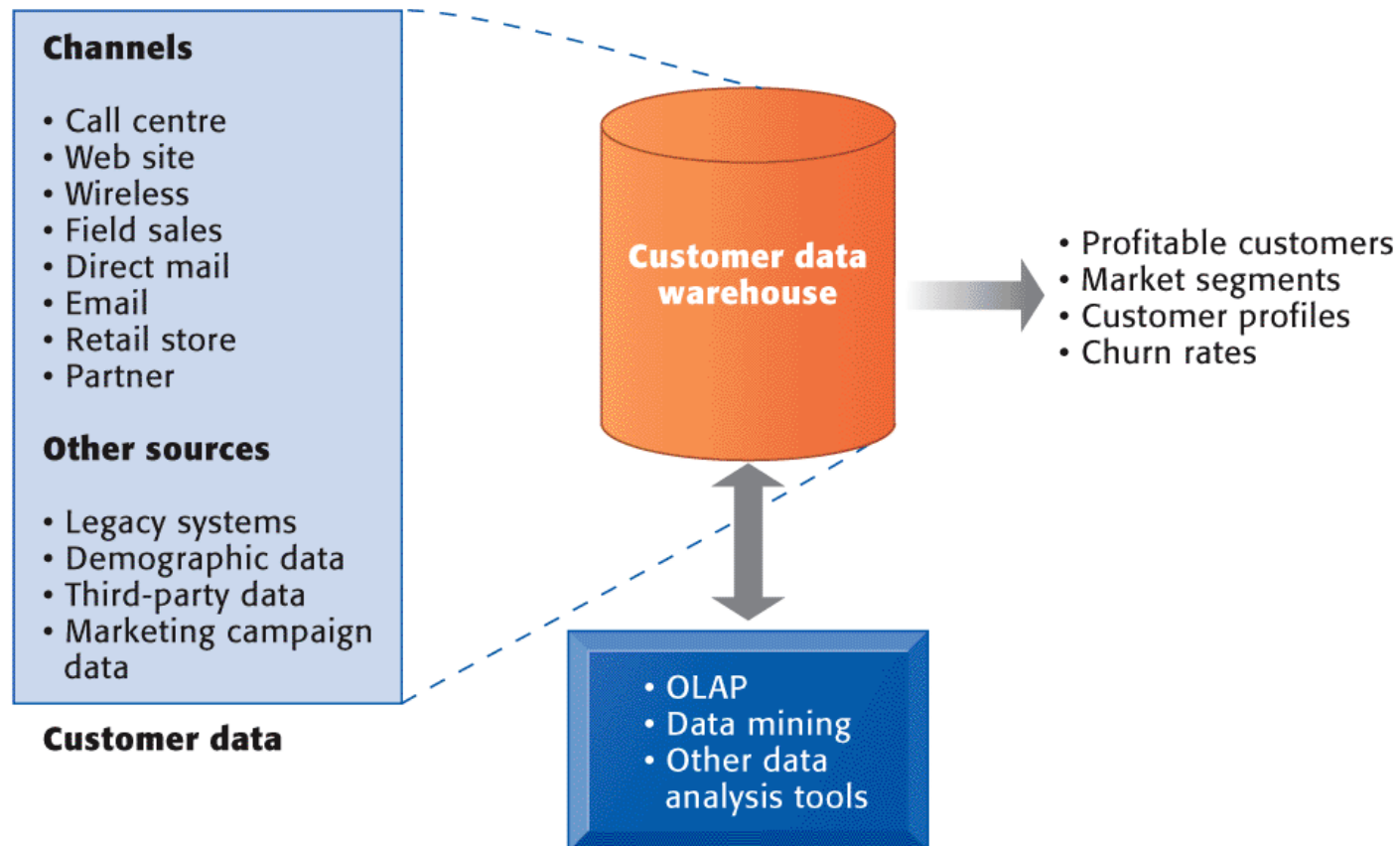
Analytical CRM uses a customer data warehouse and tools to analyze customer data collected from the firm's customer touch points and from other sources.

Analytical CRM Systems

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

Most Profitable Accounts

Account	Dollars (Millions)
Taylor	6.8
Franklin	5.5
Renovations	4.9
Bright	4.0
Barton	3.3
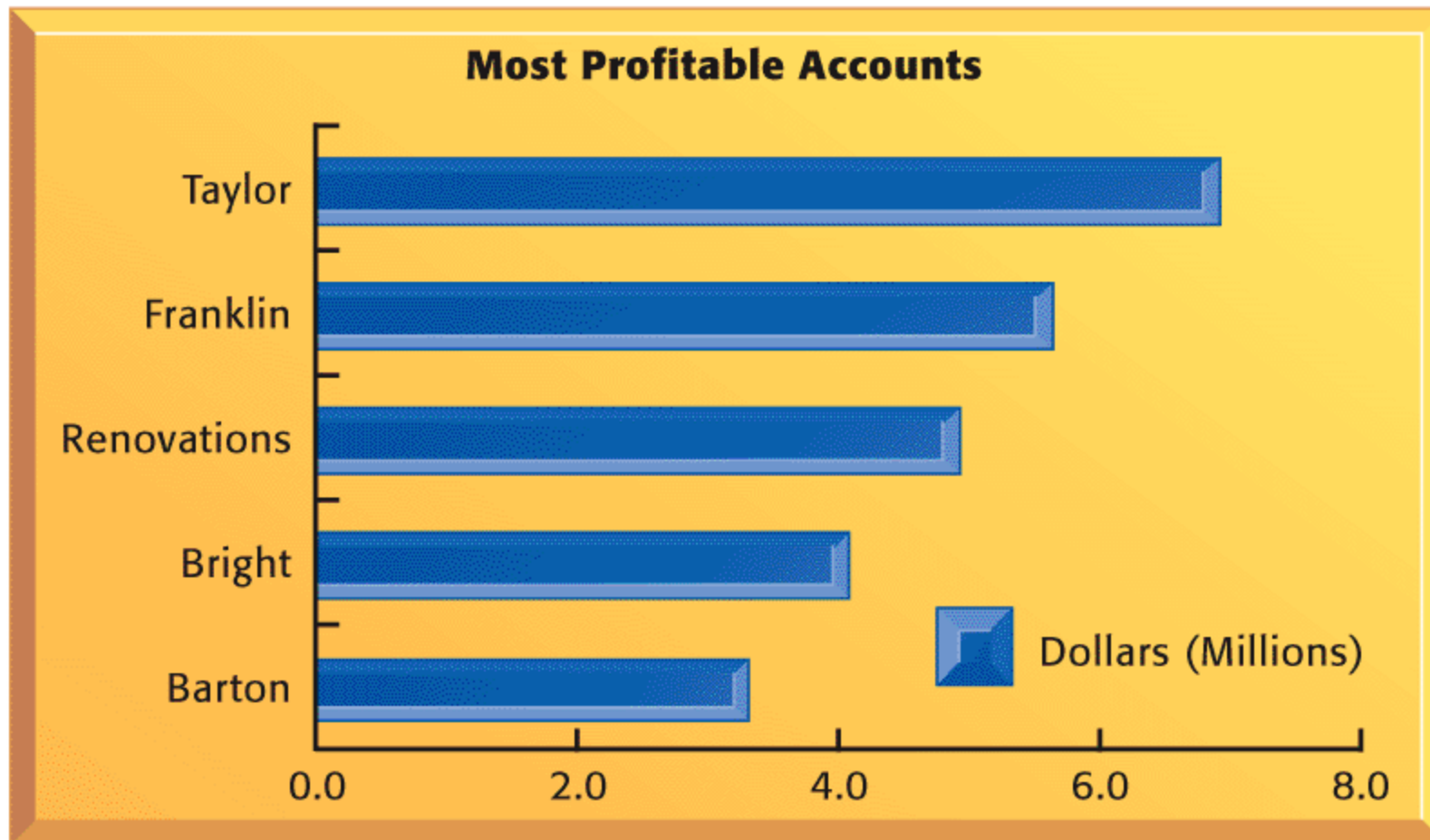
Analytical CRM Systems

- 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
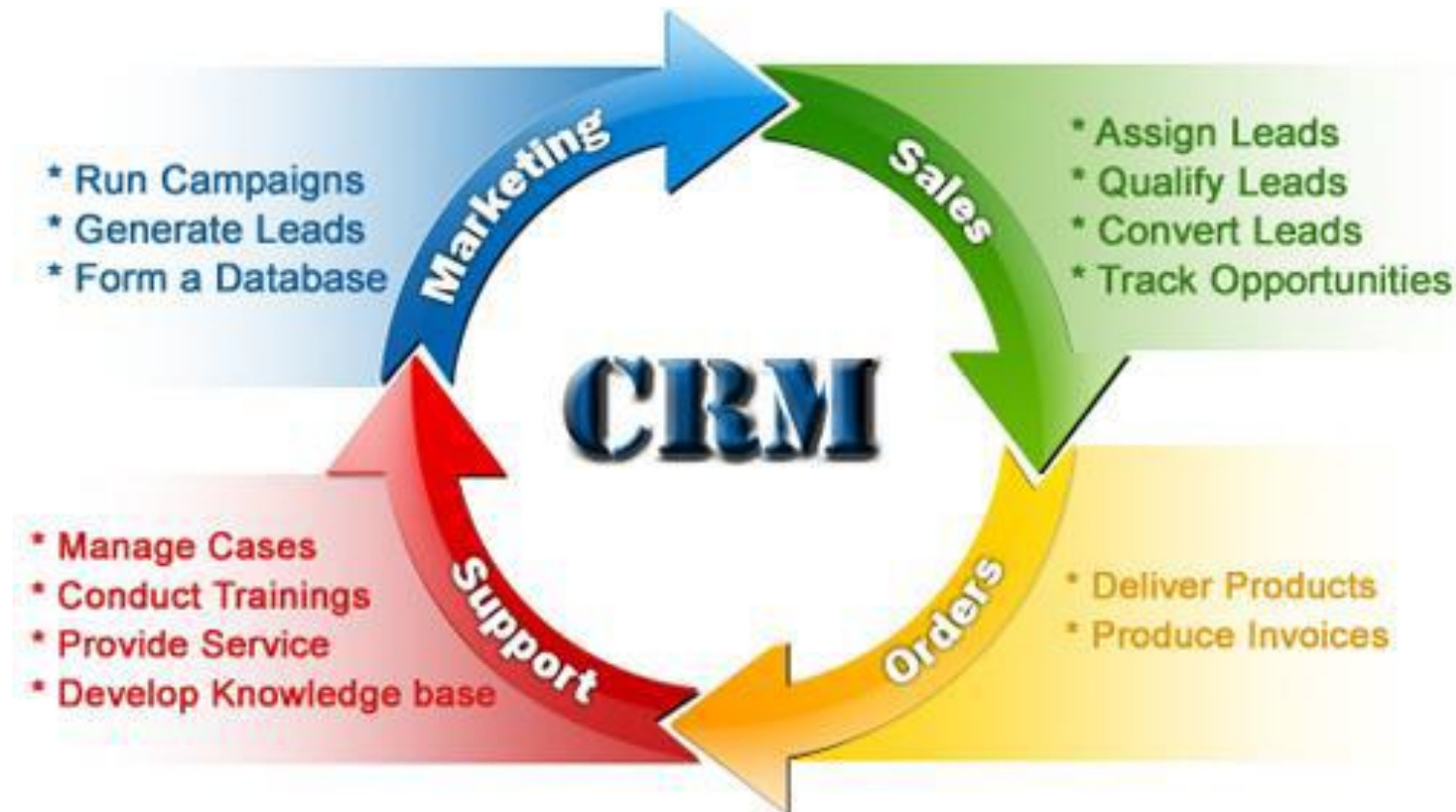
CRM Performance Measurement
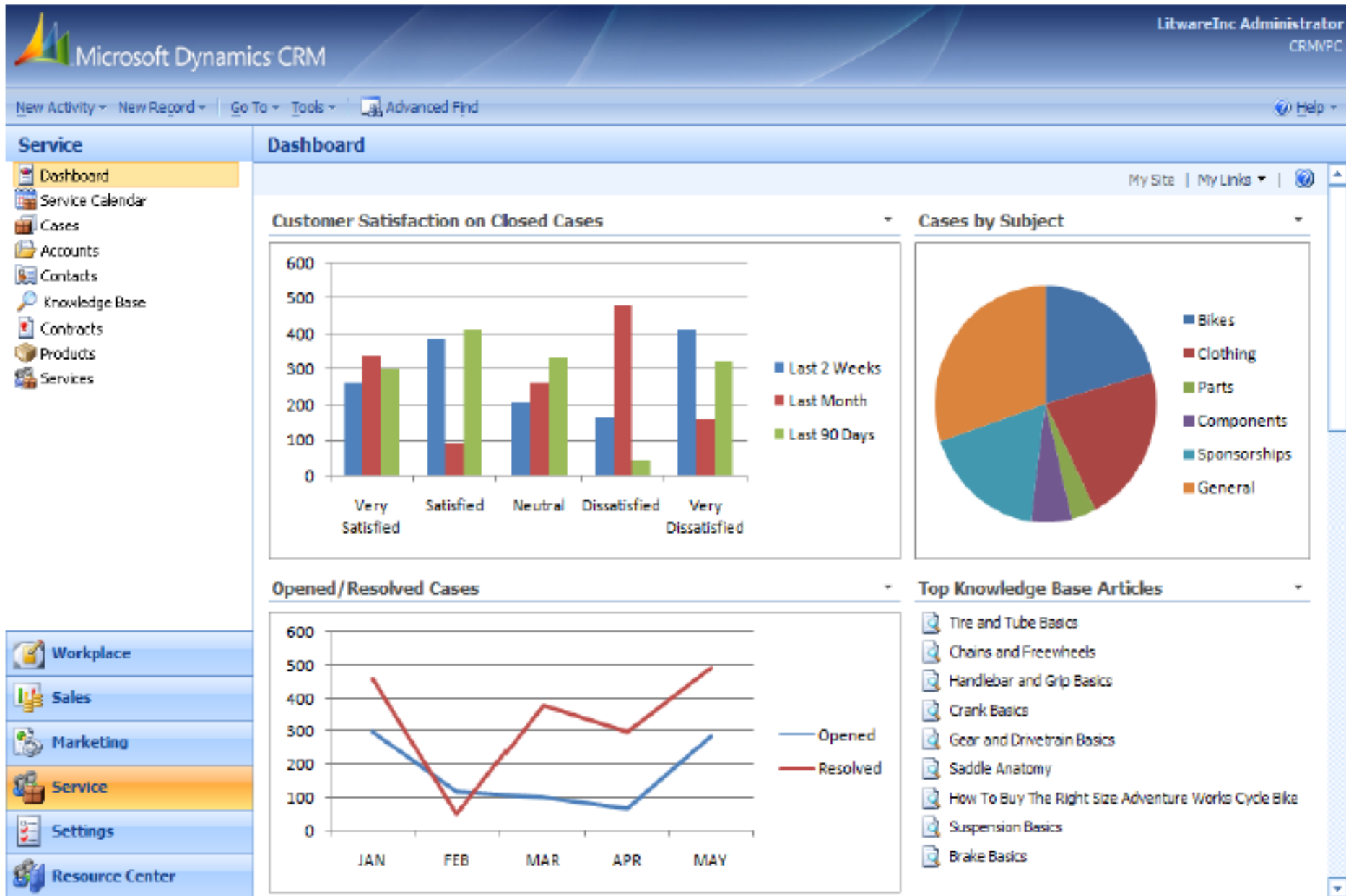
Integrated CRM Portal
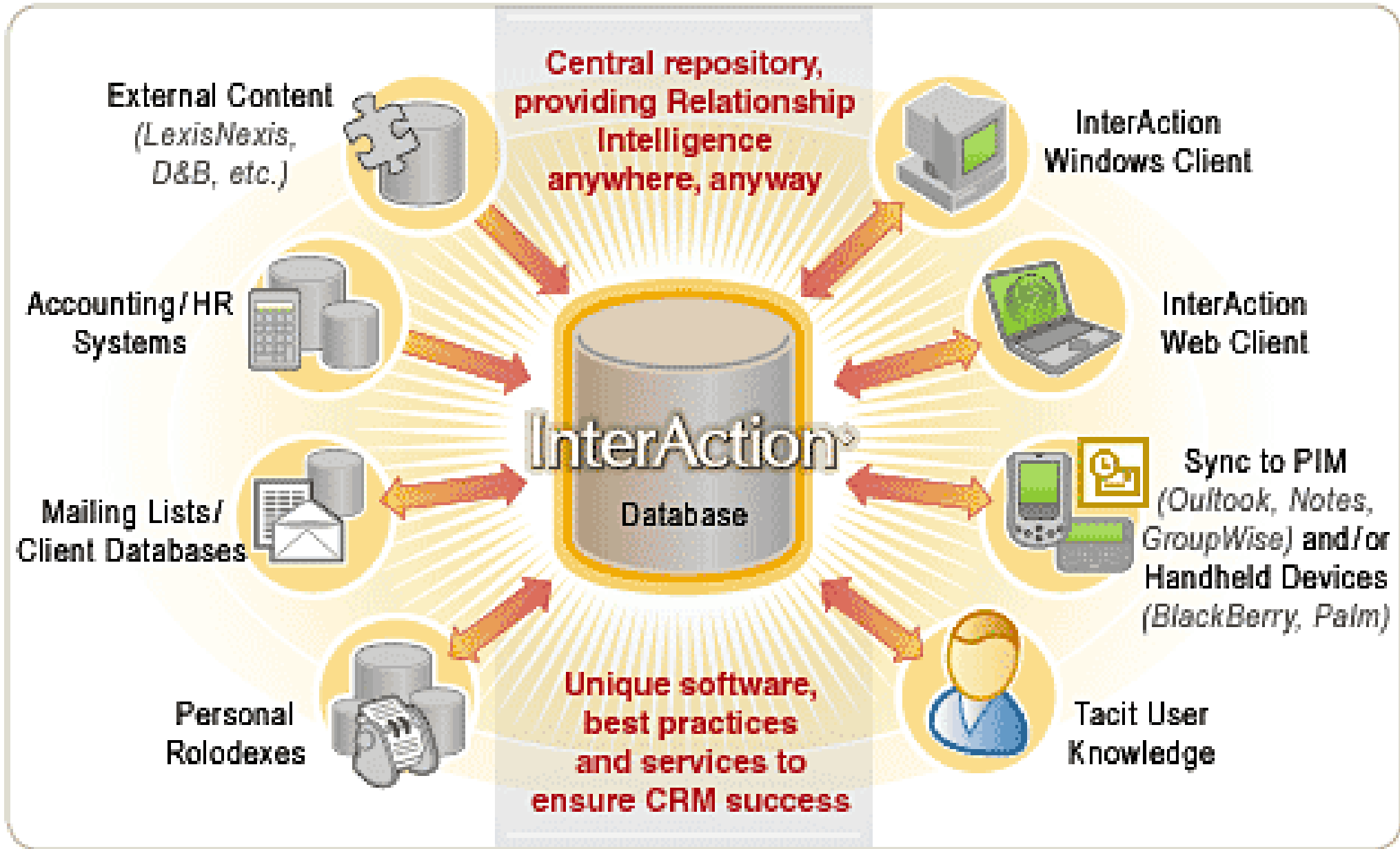
External Content
(LexisNexis, D&B, etc.)

Accounting / HR Systems

Mailing Lists / Client Databases

Personal Rolodexes

Central repository, providing Relationship Intelligence anywhere, anyway

InterAction Database

Unique software, best practices and services to ensure CRM success

InterAction Windows Client

InterAction Web Client

Sync to PIM (Outlook, Notes, GroupWise) and/or Handheld Devices (BlackBerry, Palm)

Tacit User Knowledge

Enterprise Resource Planning

Enterprise Resource Planning (ERP) Systems
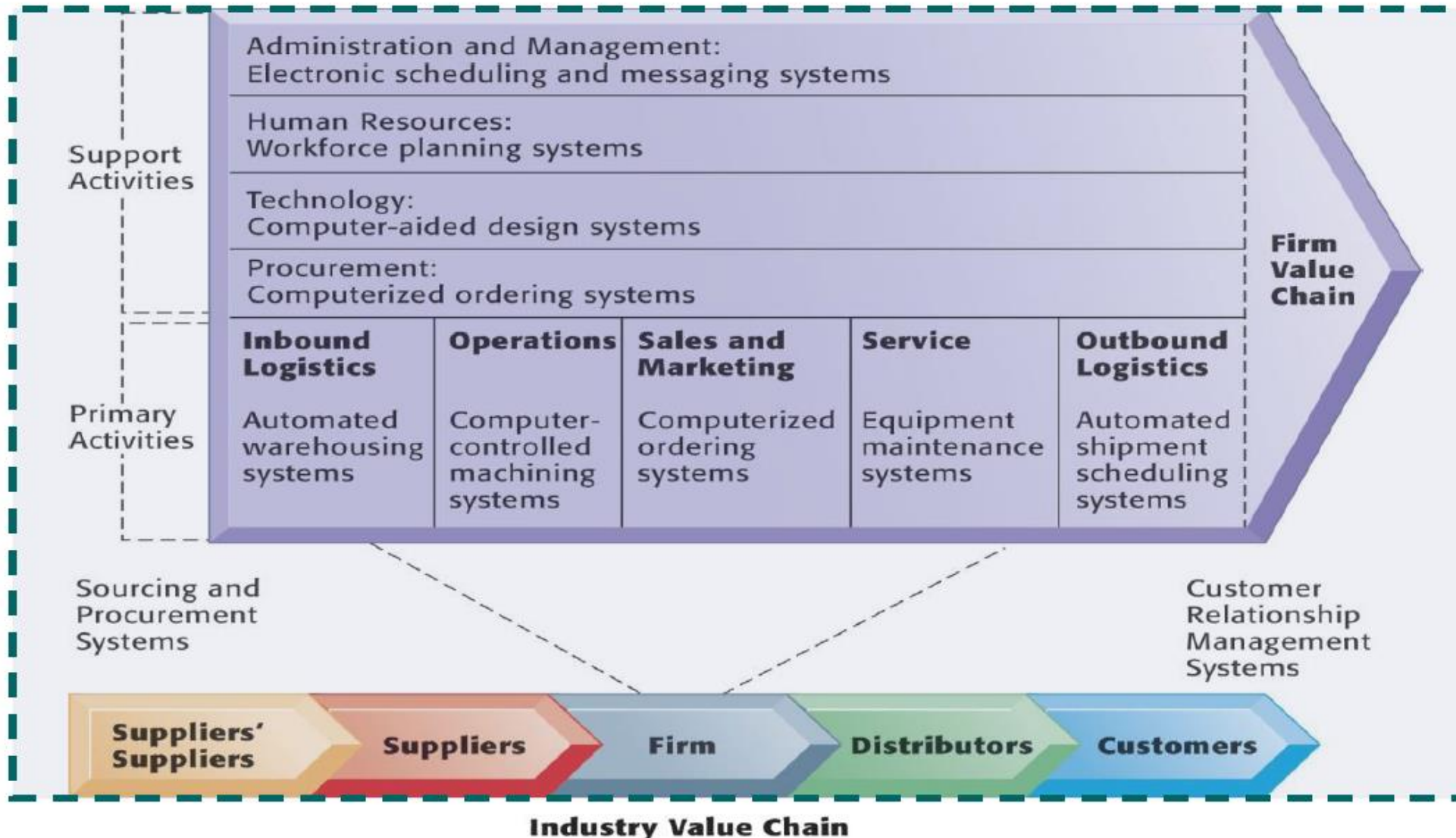
Enterprise Resources Planning (ERP) Definition

- 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 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 <u>discouraged</u> but these systems have the flexibility to support other outside applications using the common data repository and interfaces

ERP System Architecture
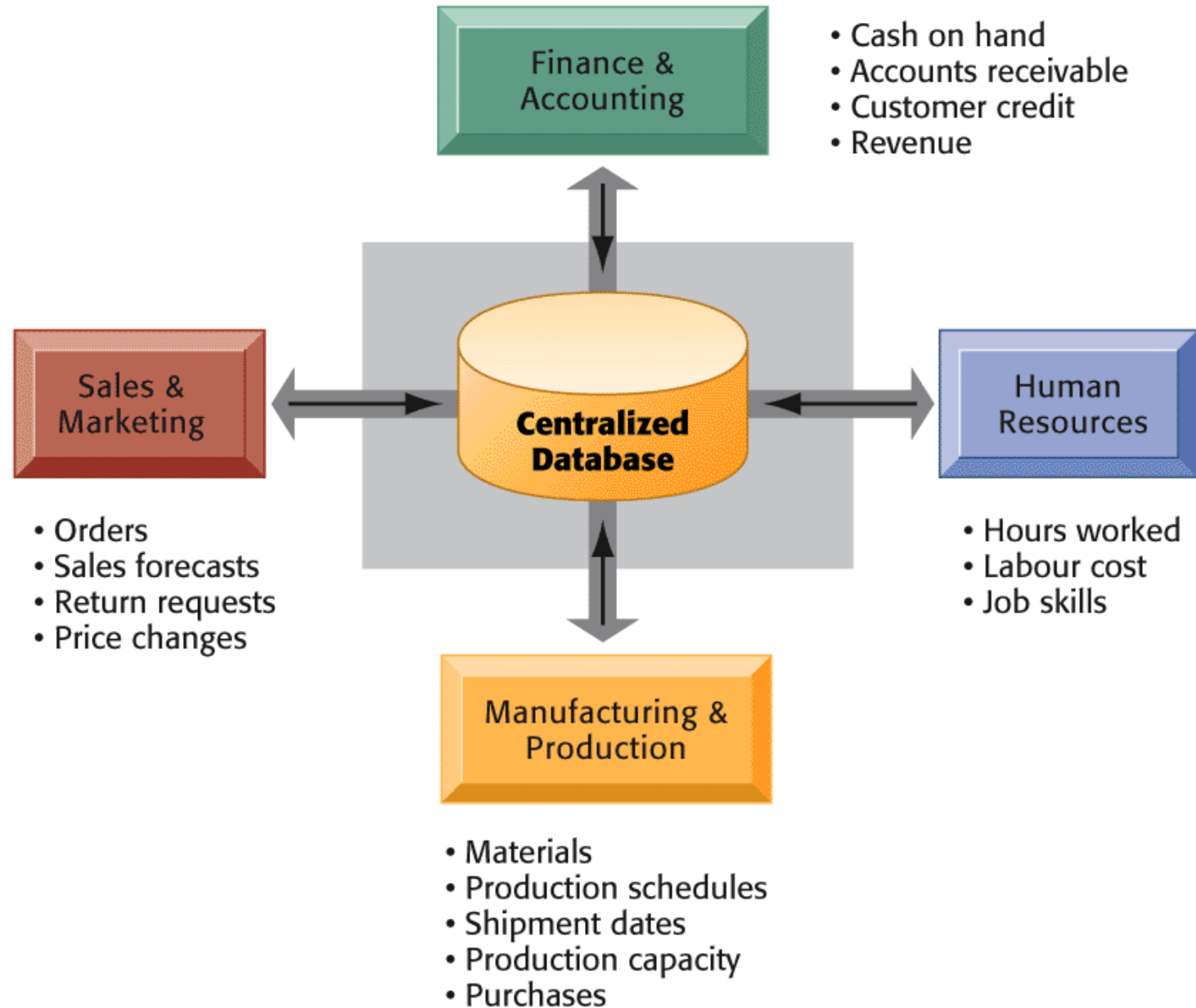
ERP Software (con't)

- 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

- 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
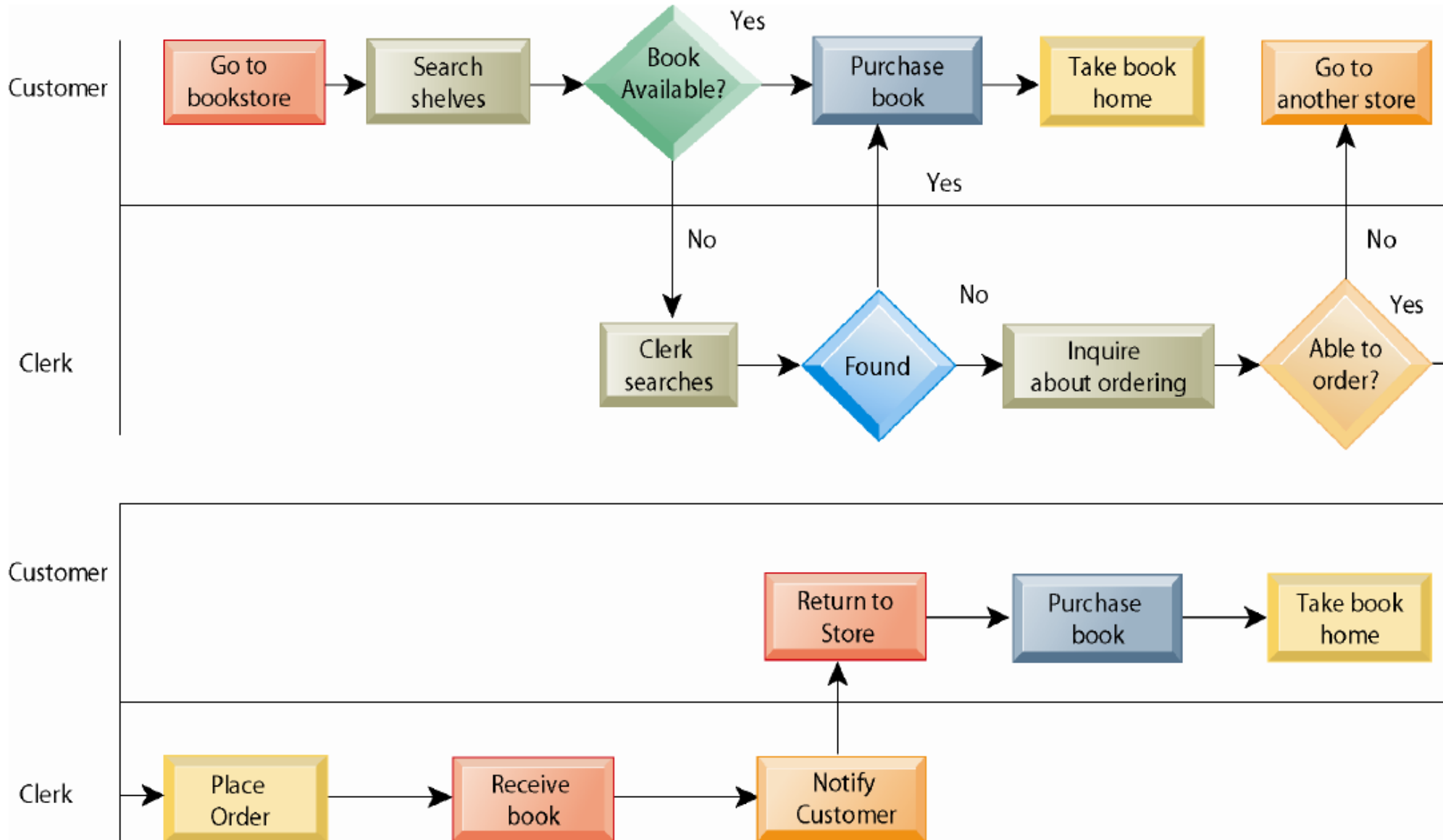
Choosing an ERP System - BPM
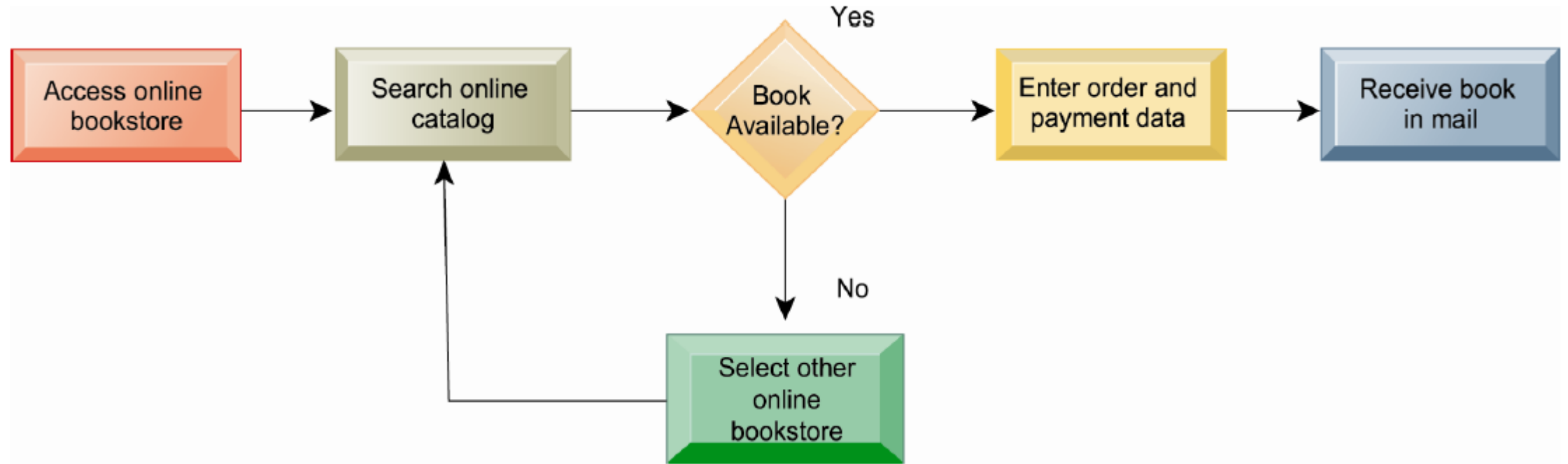
Recommendations for Enterprise System Success

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
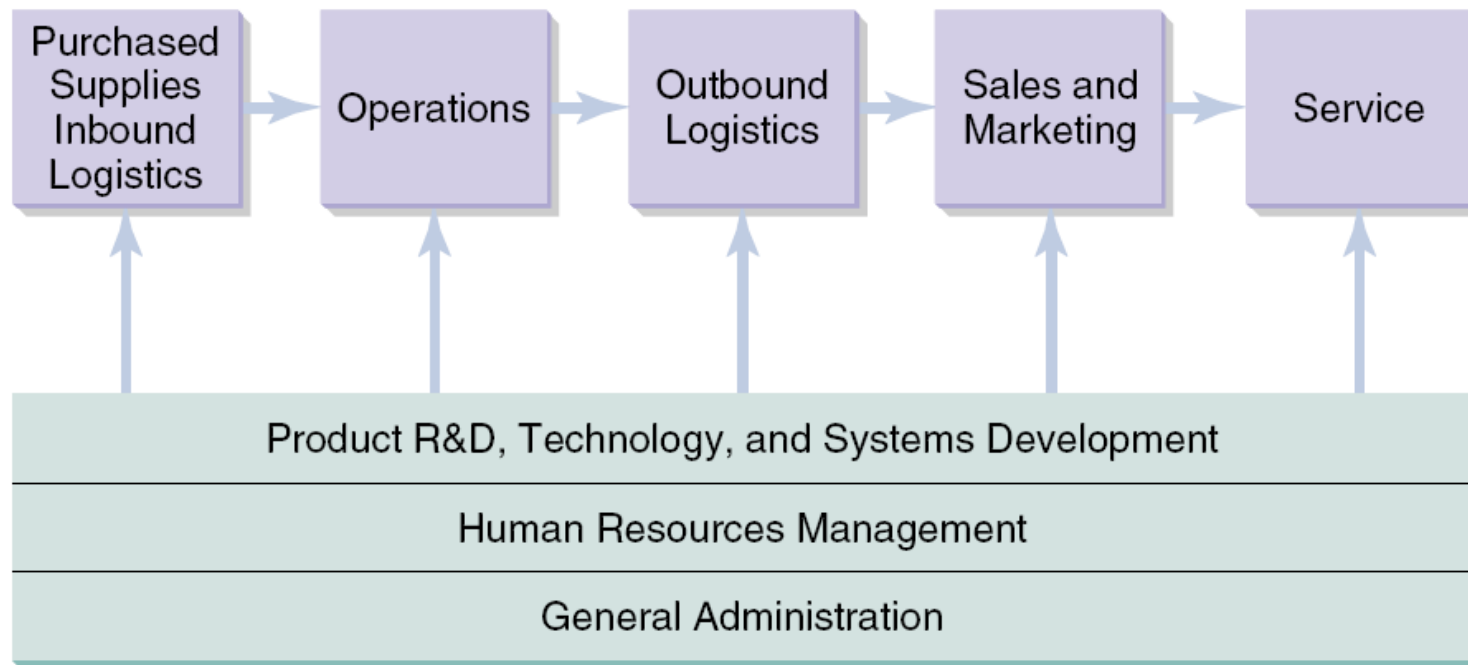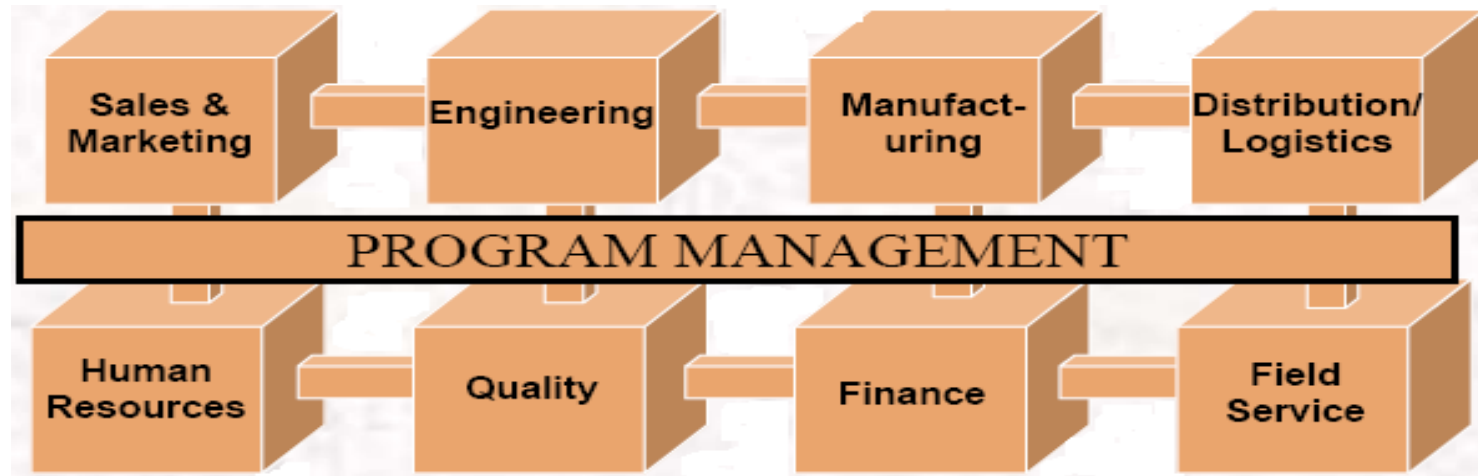
Sales and Operations Planning

- 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
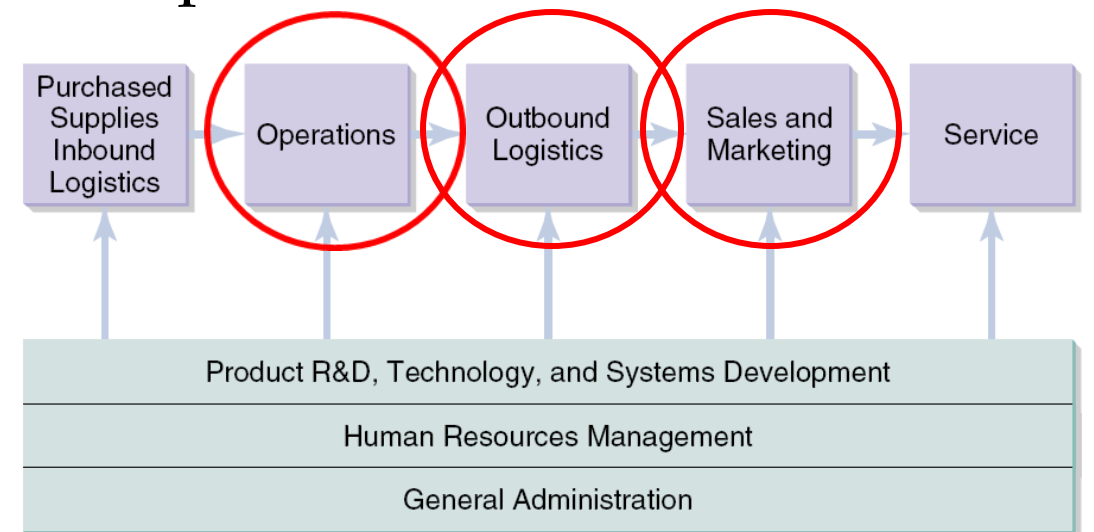
Engineering

- 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
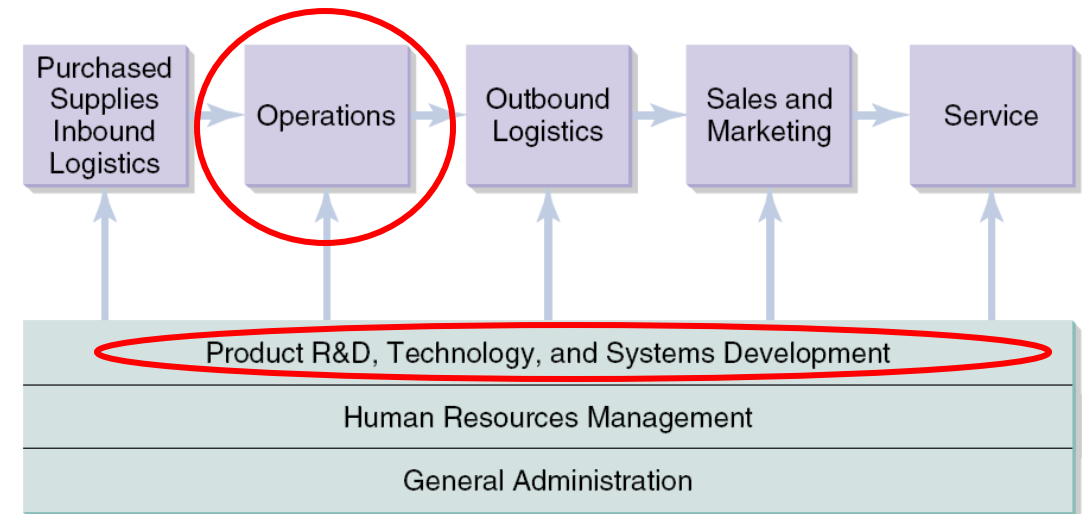
Manufacturing

- 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
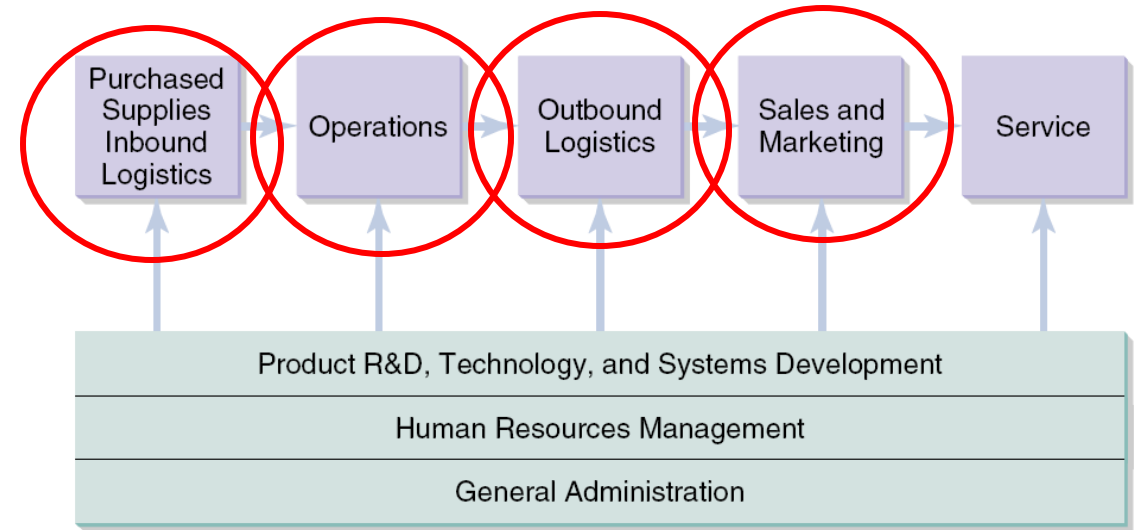
Distribution / Logistics

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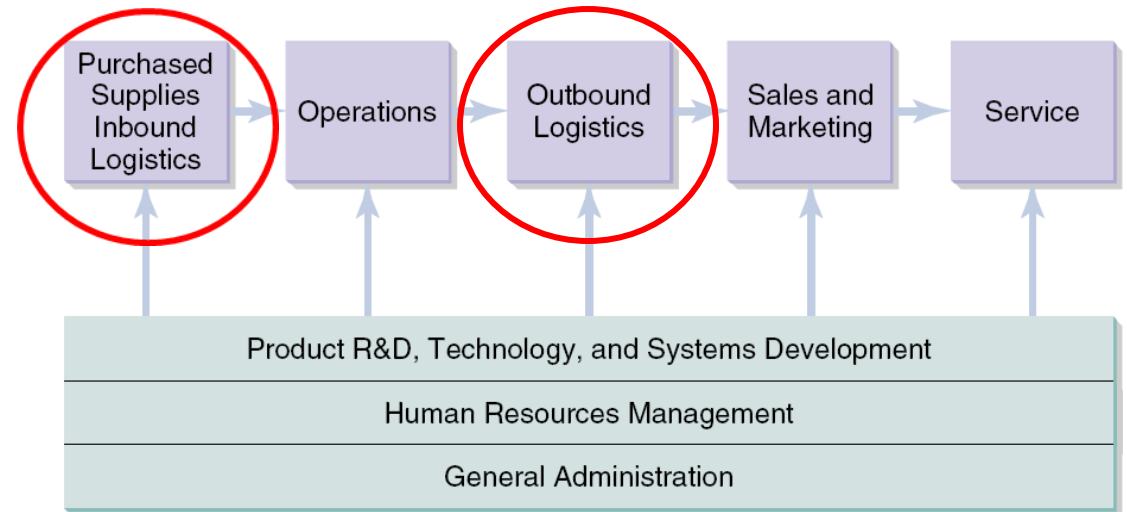
Human Resources

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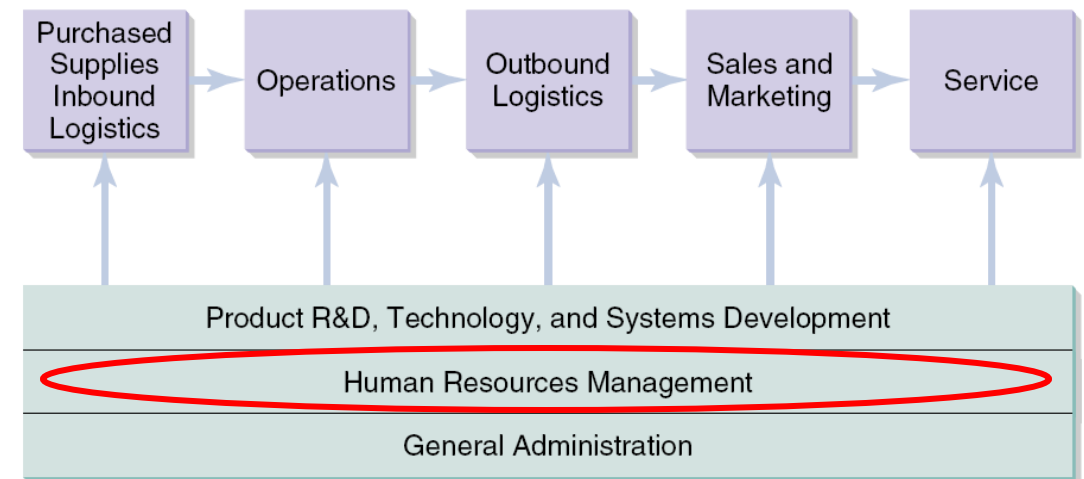
Quality

- 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
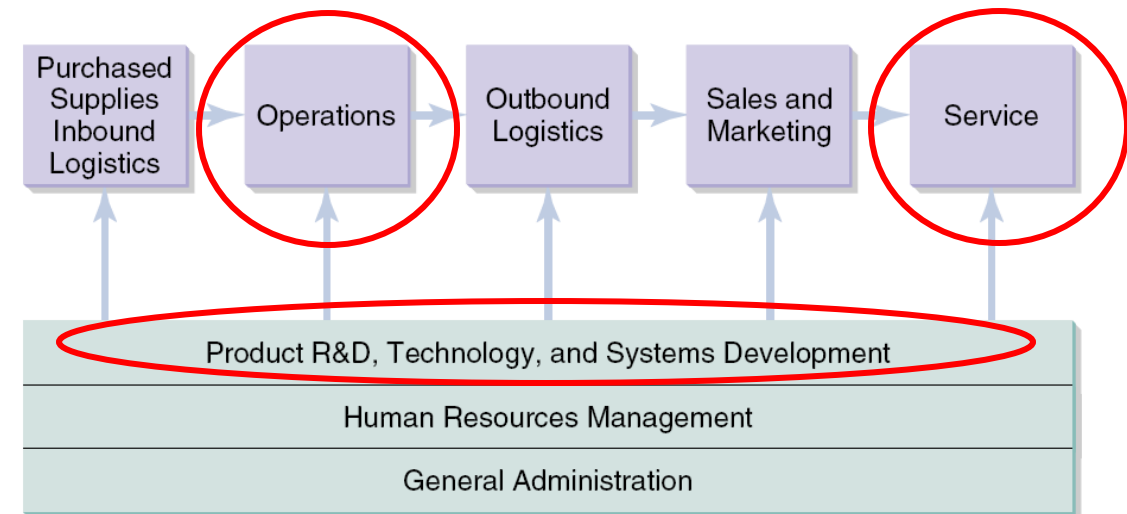
Finance

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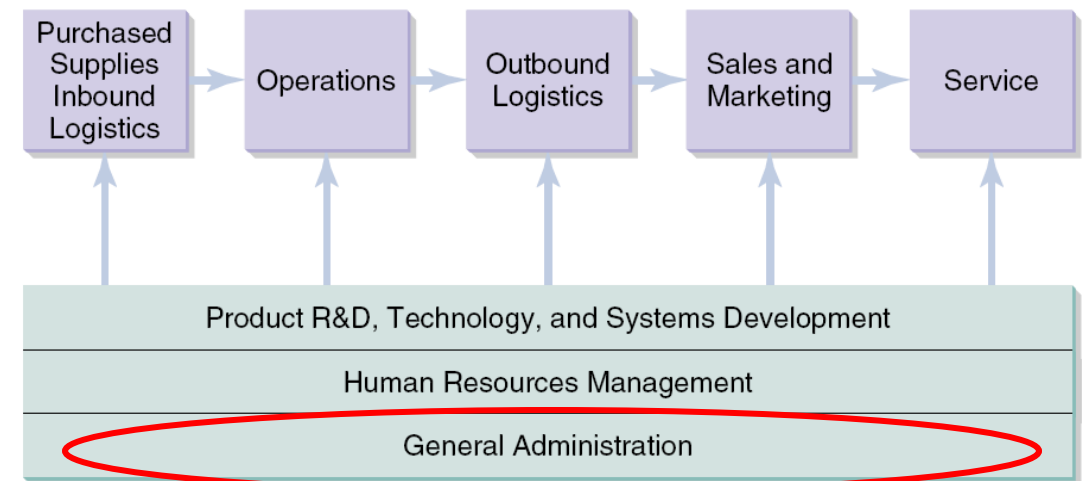
Field Service

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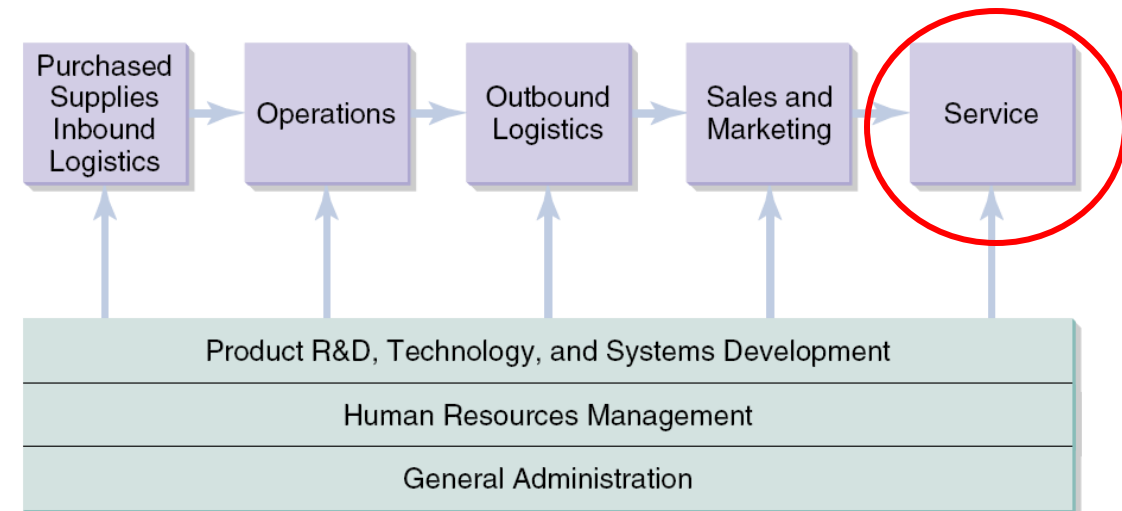
Enterprise Information Systems

End of Lecture 6