ACS-1803
Introduction to Information Systems

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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 Category – Enterprise Systems

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

Business Value Chain

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

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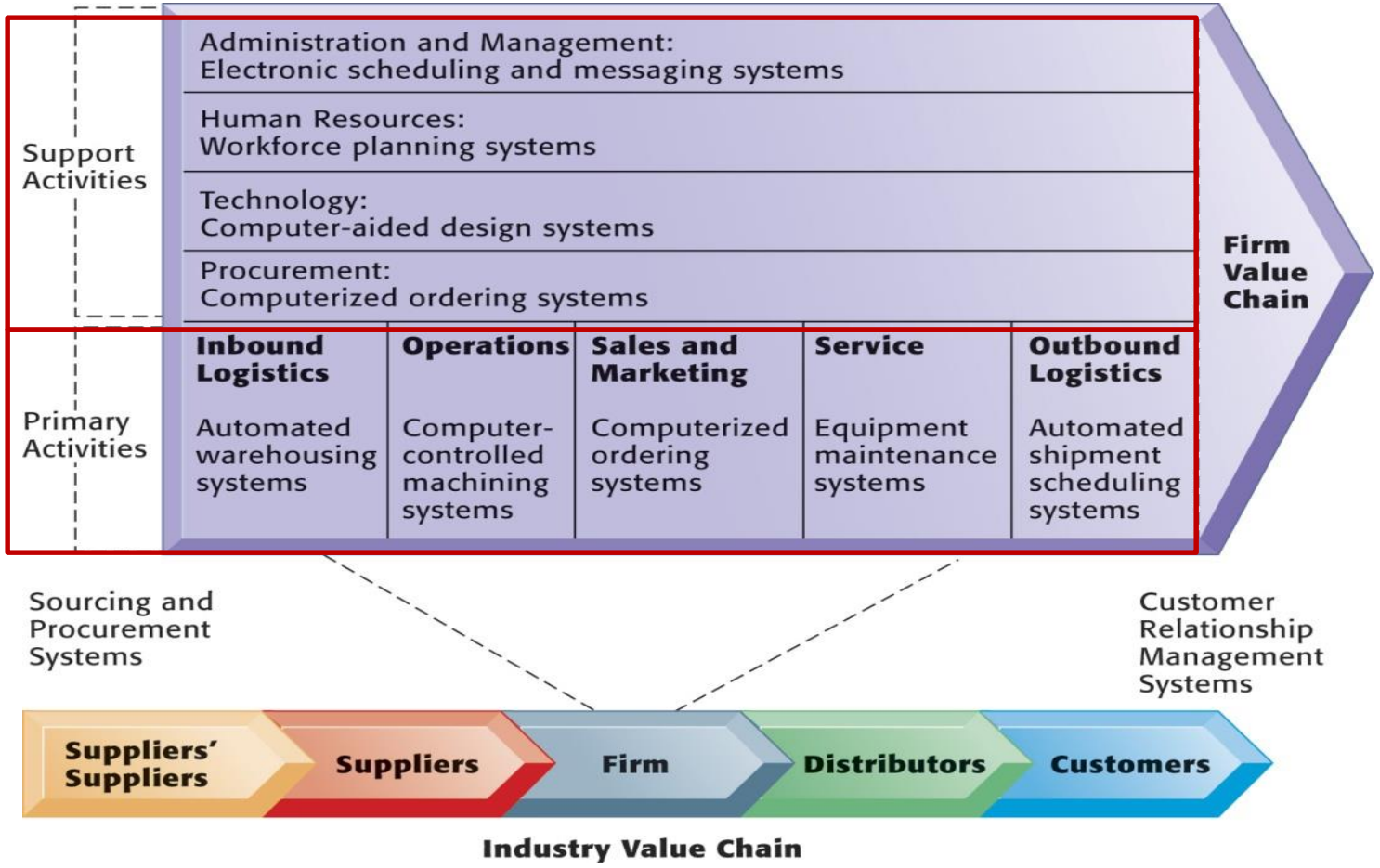
Business Value Chain Analysis



Value Chain Analysis (Michael Porter 1985) Is a process of **analyzing** an organization's a**ctivities** 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)

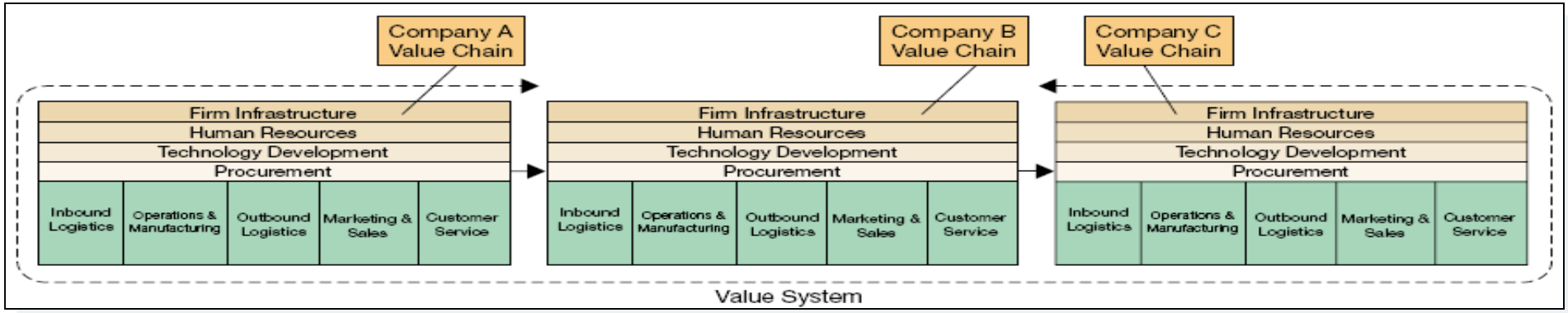
The Business Value Chain - Support Activities

Support activities are **business activities** that enable **Primary Activities.** These activities can be unique by industry but are generally more typical across industries.

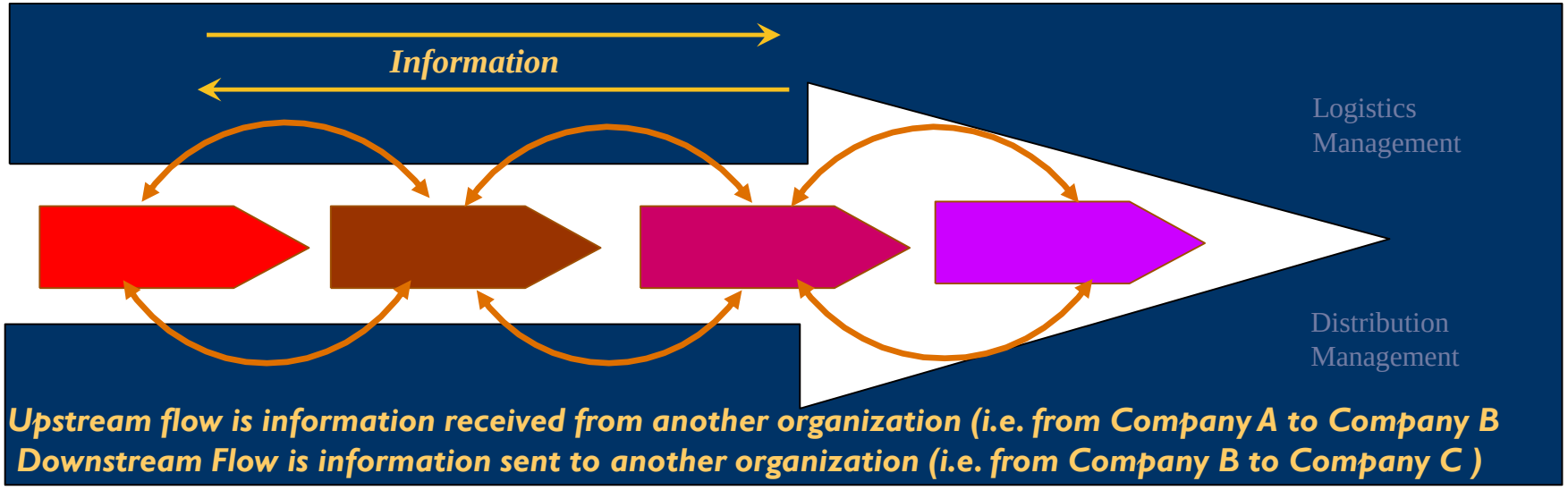
Support Activities include:

- **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

A Business Value System – Organizational Focus

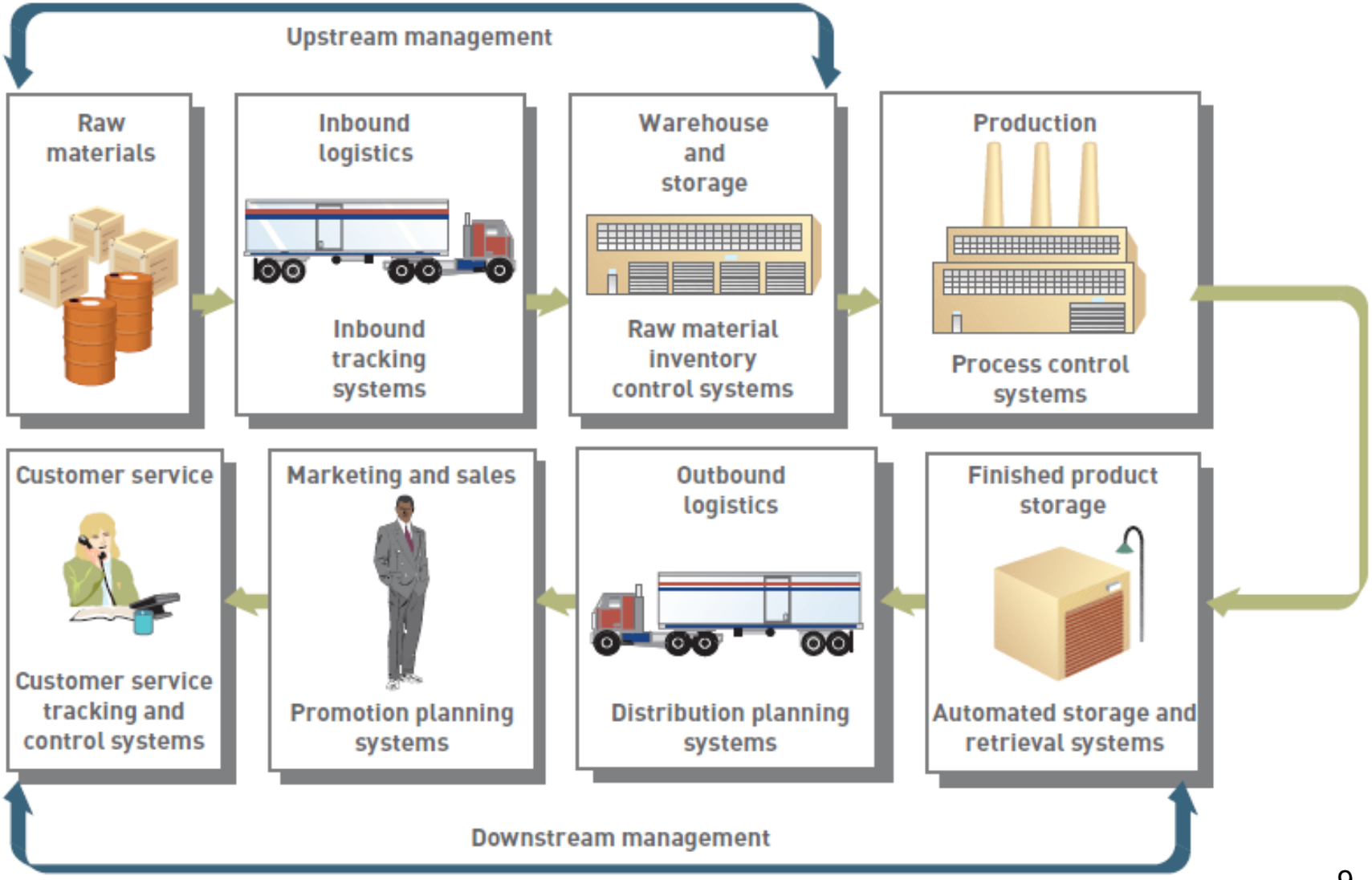


Moving the product efficiently from supplier to customer



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

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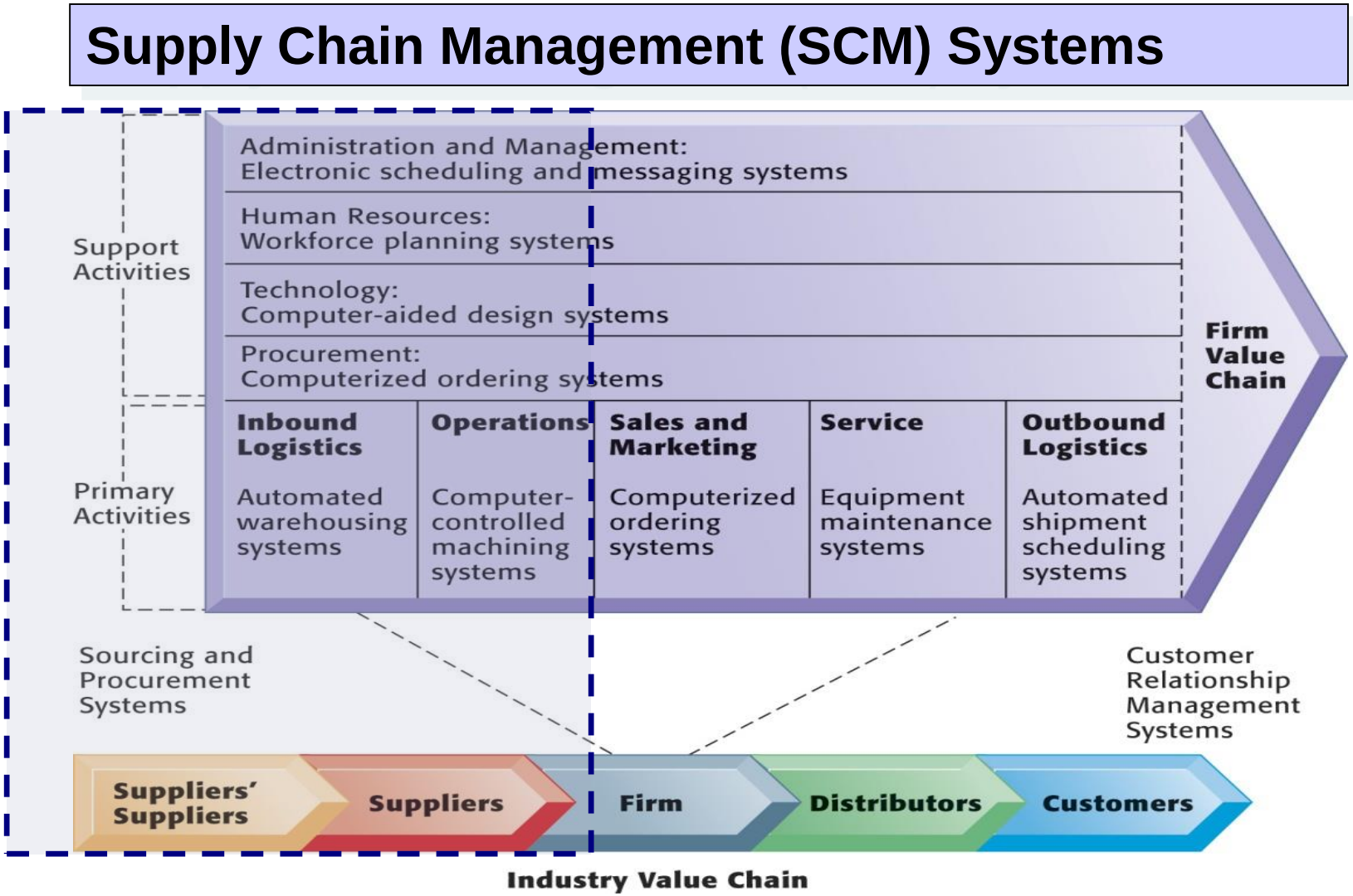
Information Systems Roles in the Value Chain



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

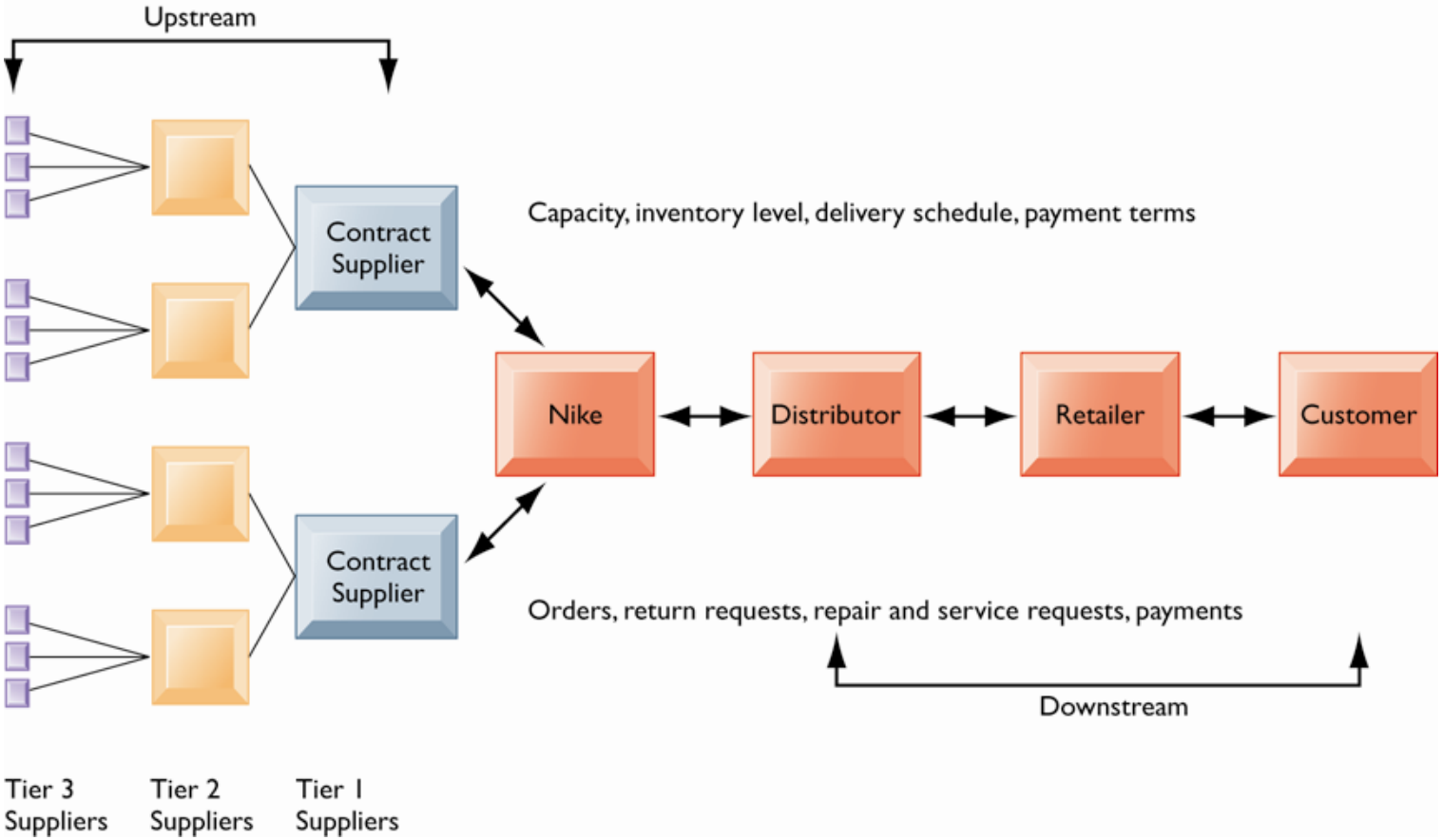
There are two primary sources of SCM systems. These systems are built to tightly integrate with ERP systems

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

SCM – Example of a Supply Network

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.

Nike's Supply Chain



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)

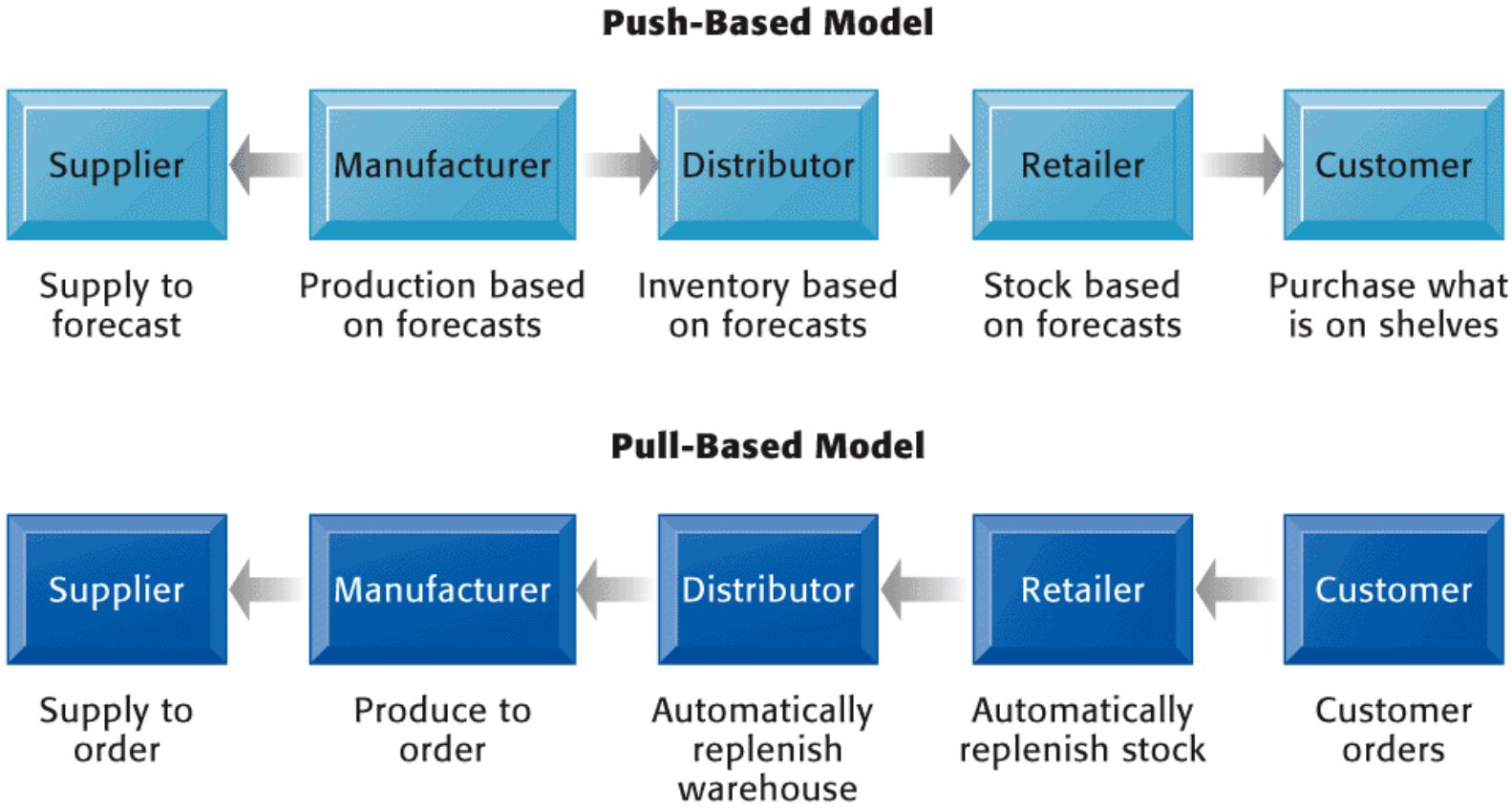
Supply Chain Management Benefits

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)

The Supply Network

Push- versus Pull-Based Supply Chain Models



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

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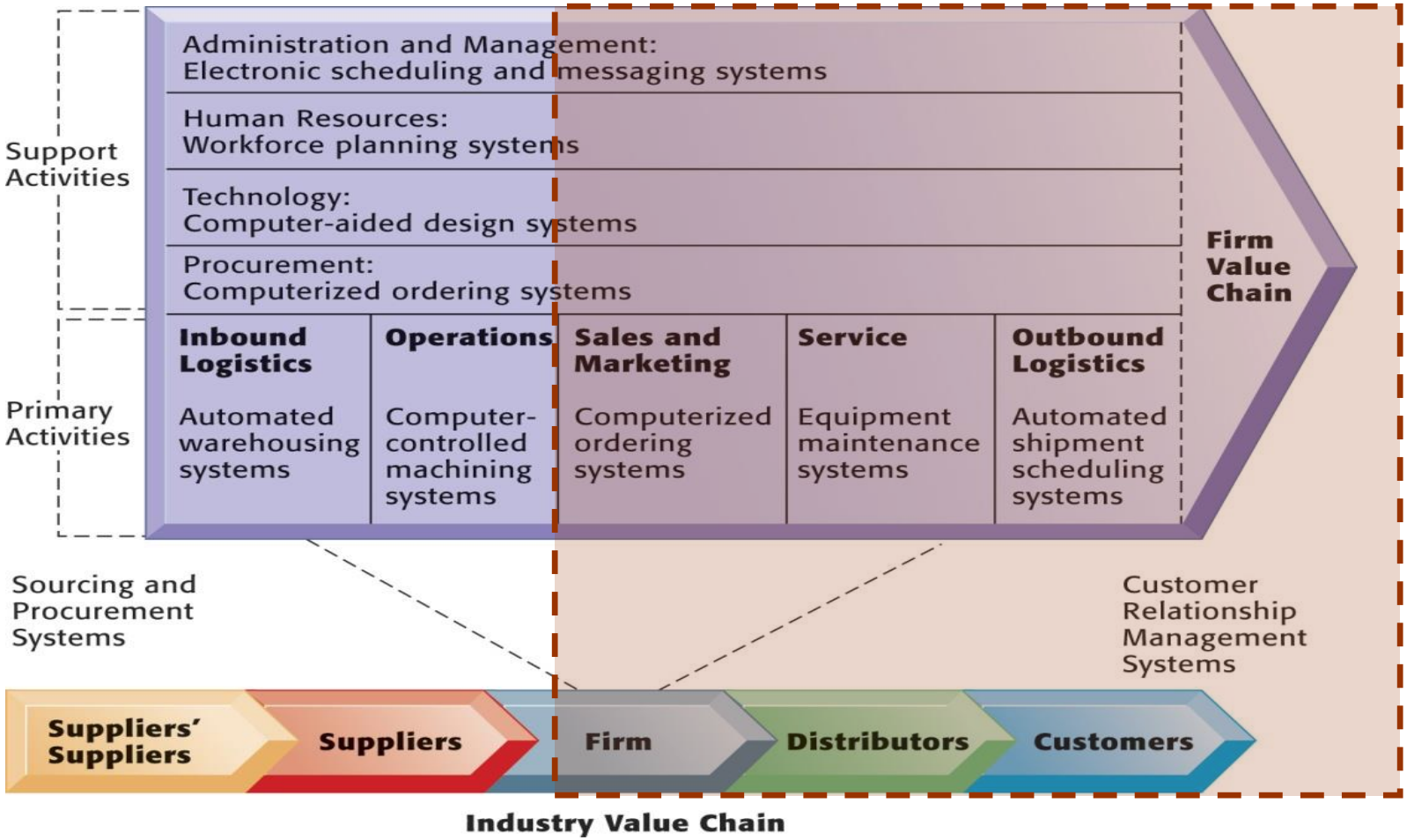
Information Systems Roles in the Value Chain

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 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)

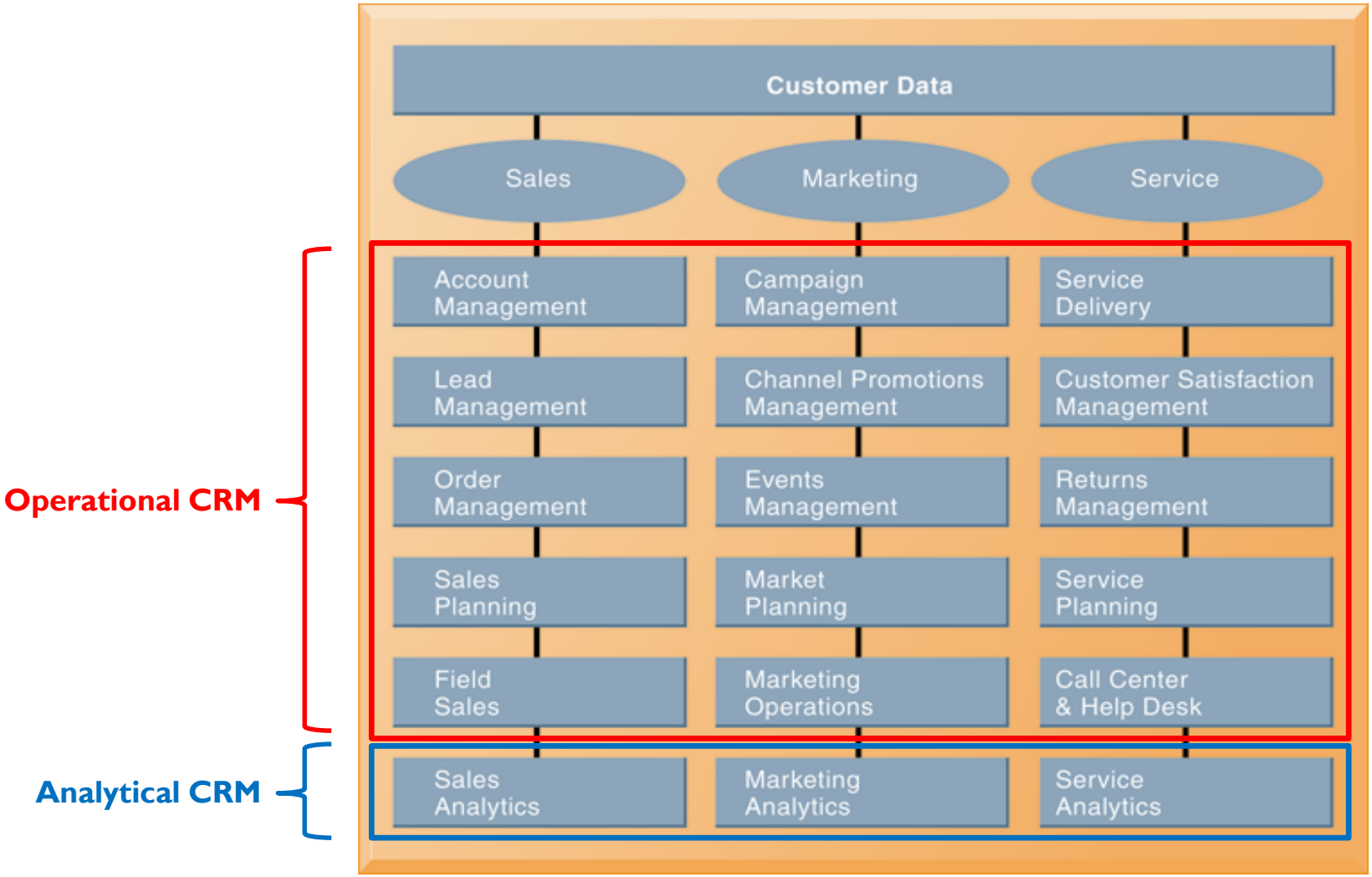
Operational and Analytical CRM

- 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 and Analytical CRM

- 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

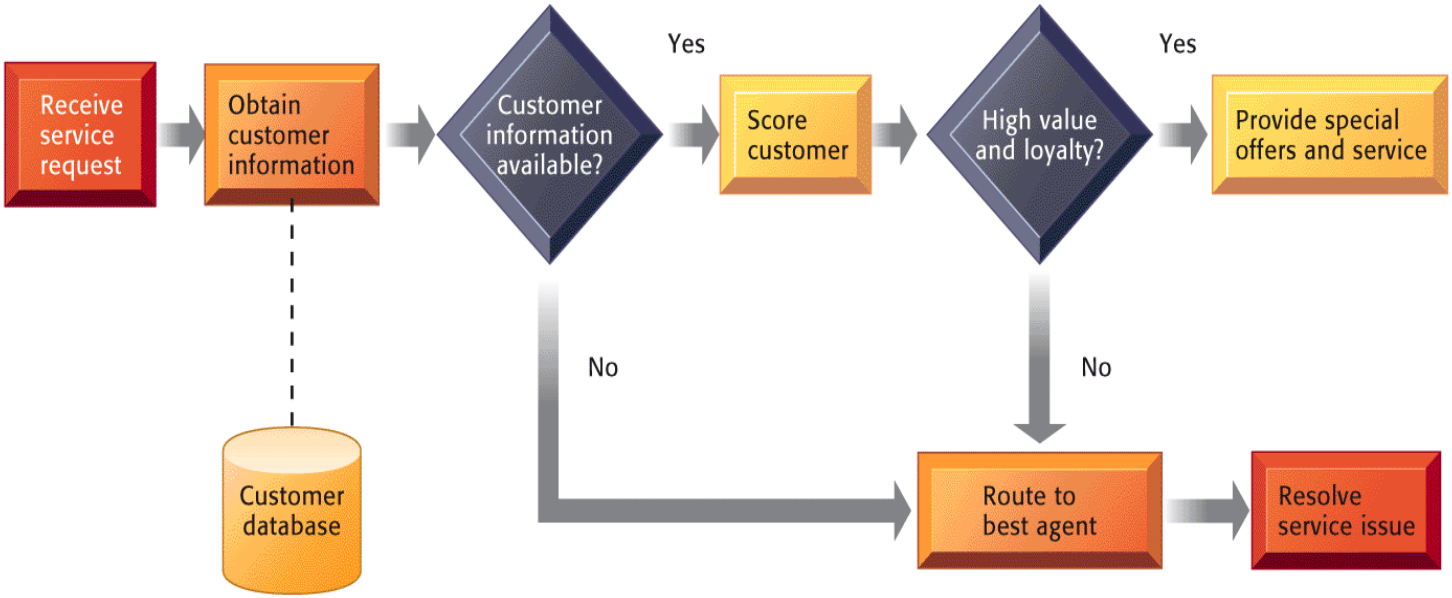
Operational and Analytical CRM



Operational CRM Systems

Customer Loyalty Management Process Map

FIGURE 14-13 *Customer loyalty management process map*

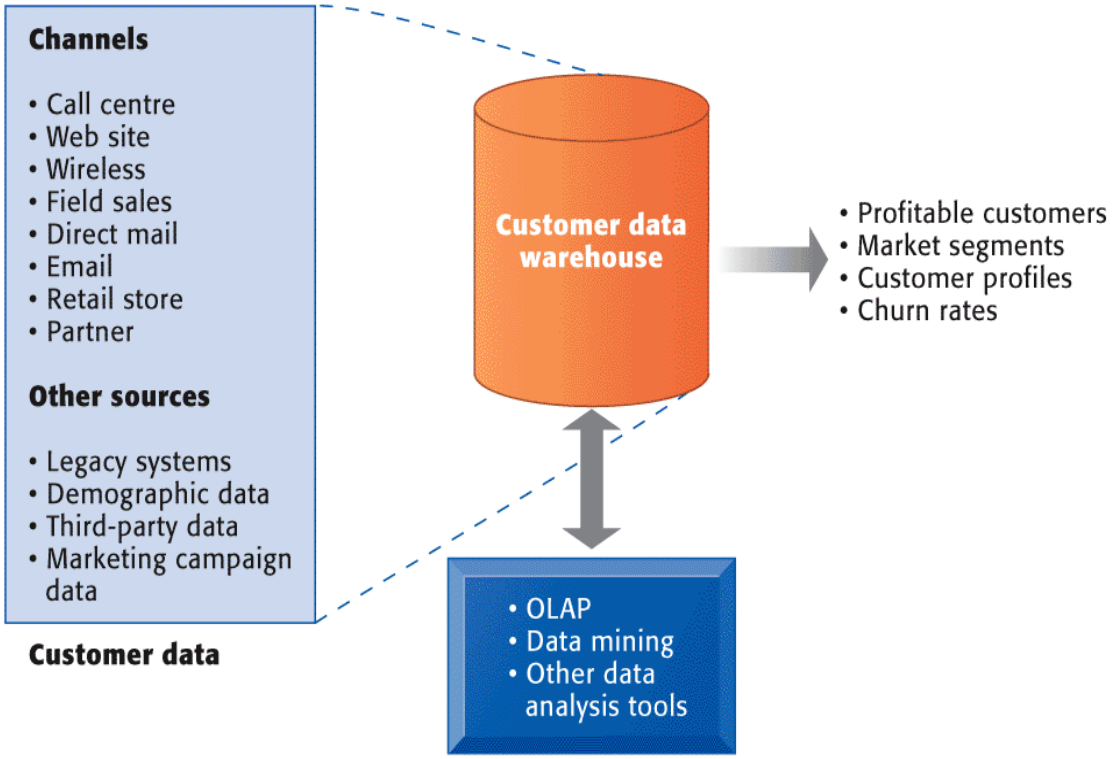


This process map shows how a best practice for promoting customer loyalty through customer service would be modelled by customer relationship management software. The CRM software helps firms identify high-value customers for preferential treatment.

Analytical CRM Systems

Analytical CRM Data Warehouse

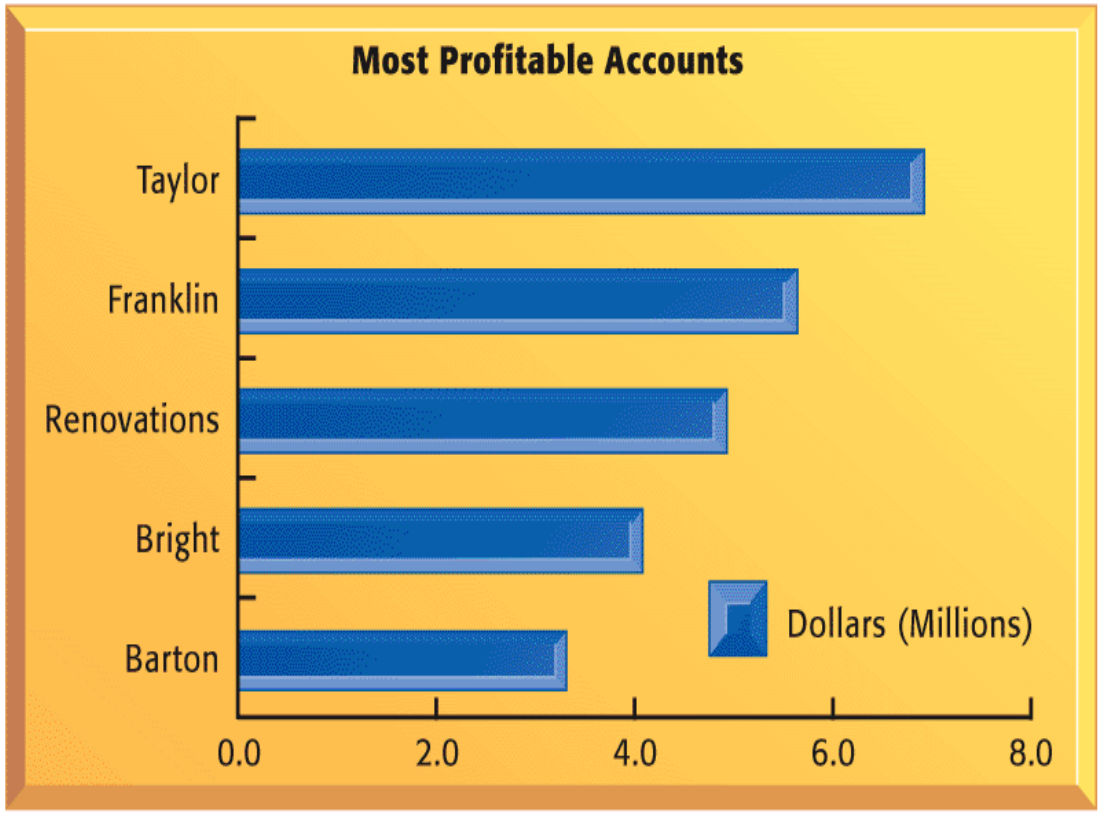
FIGURE 14-14 *Analytical CRM data warehouse.*



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

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

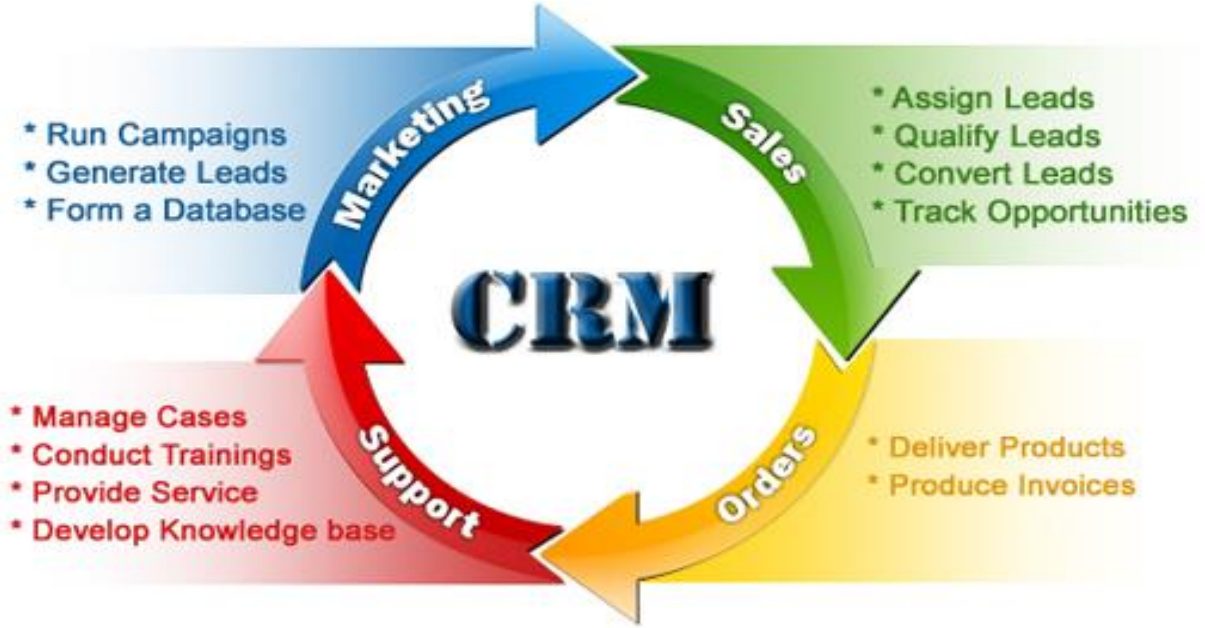


Analytical CRM Systems

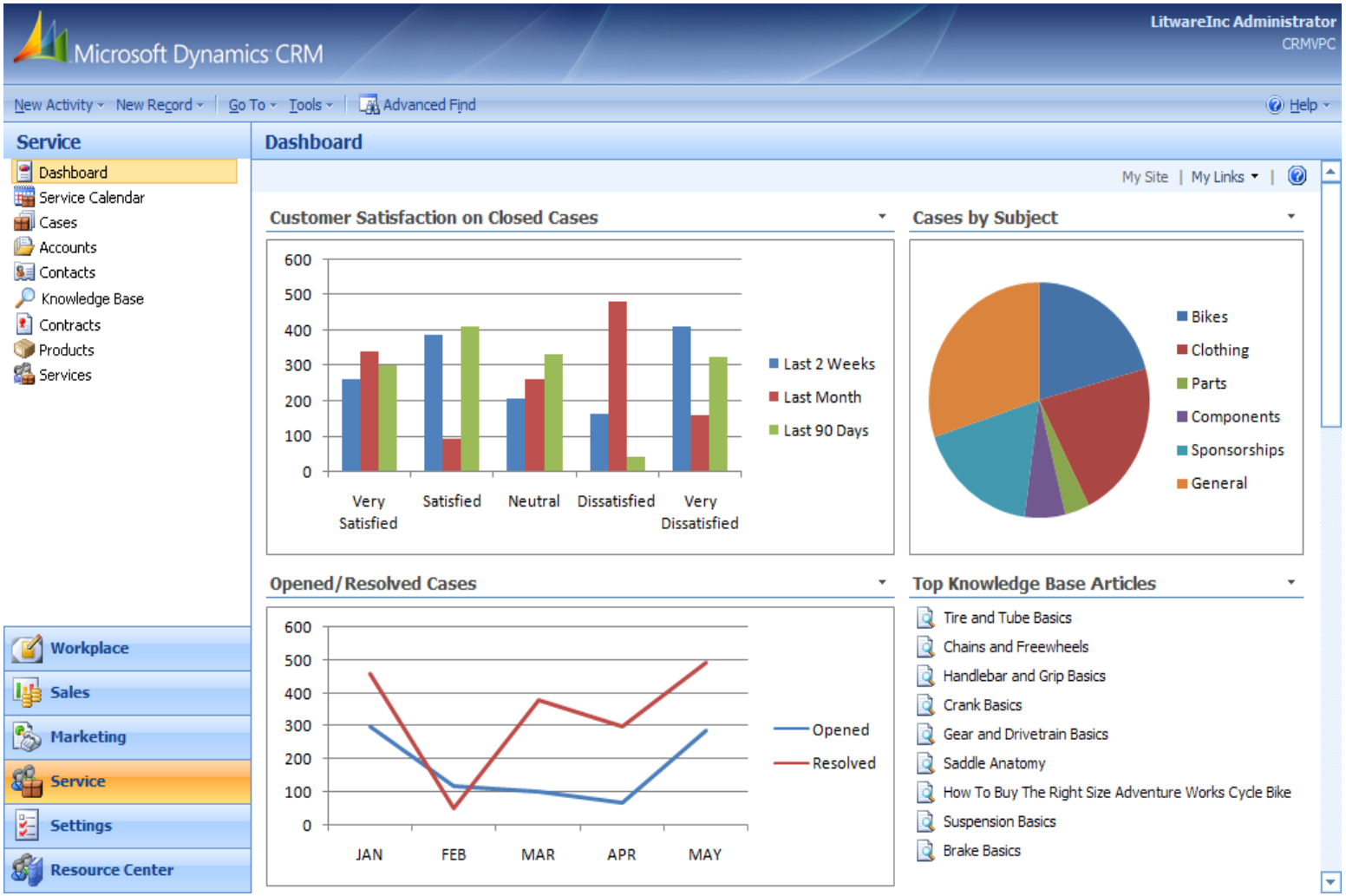
- CRM Performance Measurement
  - Metrics for may include:
  - Cost per lead
  - Cost per sale
  - Number of repeat customers
  - Reduction of churn
  - Sales closing rate

CRM Software

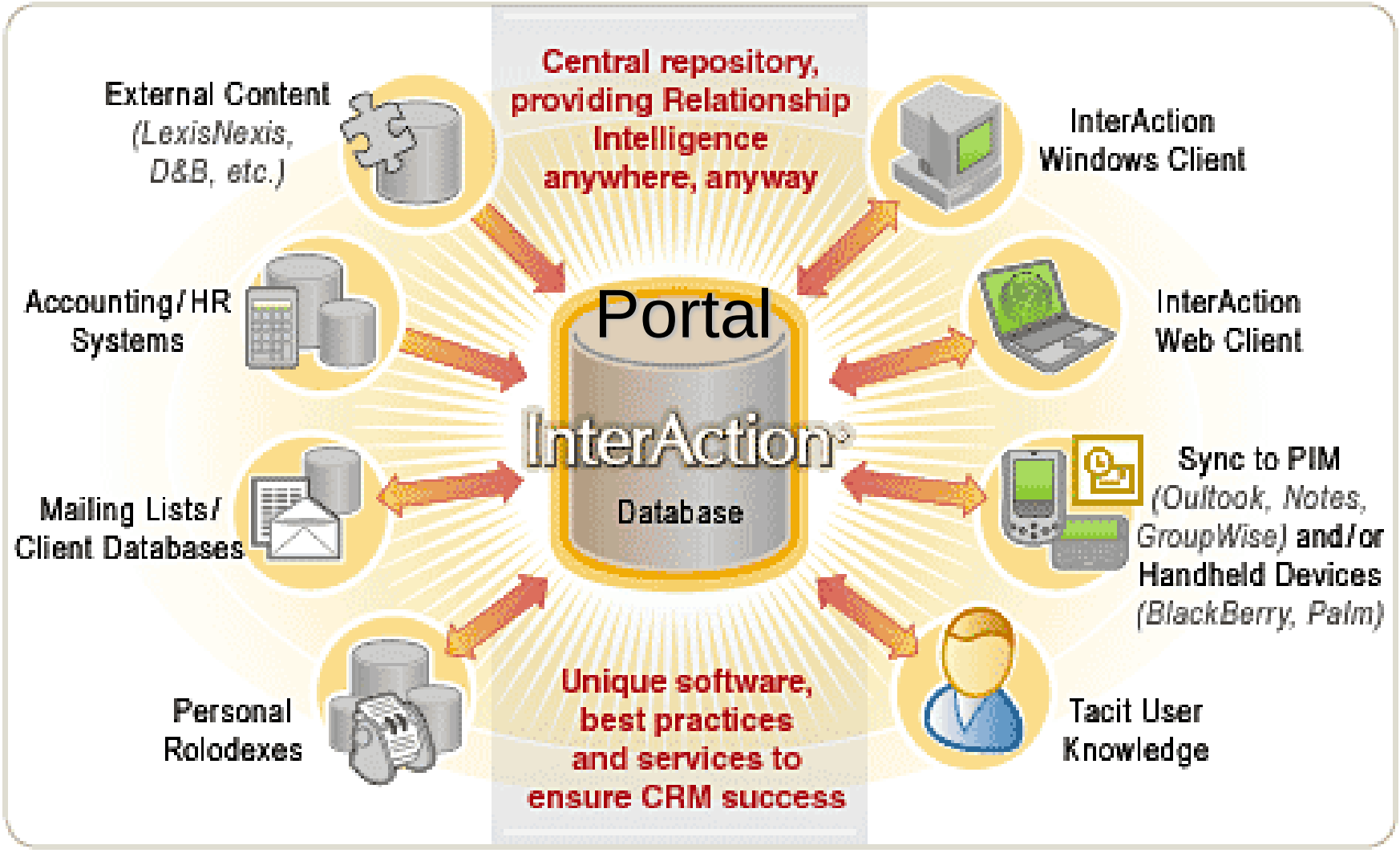
- Customer Relationship Management (CRM) Software
  - Can range from niche tools to large-scale enterprise applications
  - Can link to other major enterprise applications, such as supply chain management



CRM Performance Measurement



Integrated CRM - Portal



Enterprise Resource Planning (ERP) Systems

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

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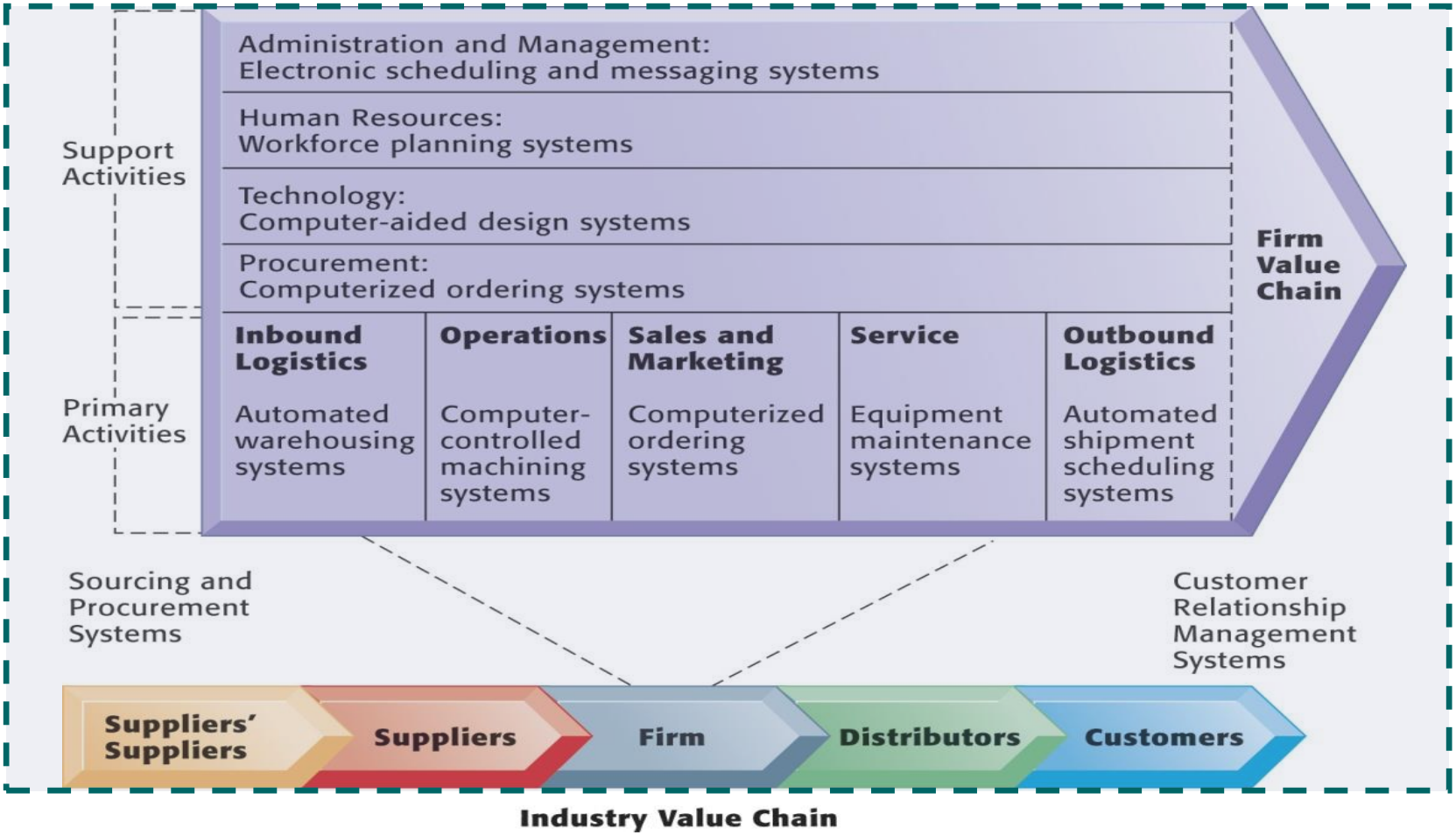
Information Systems Roles in the Value Chain

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.

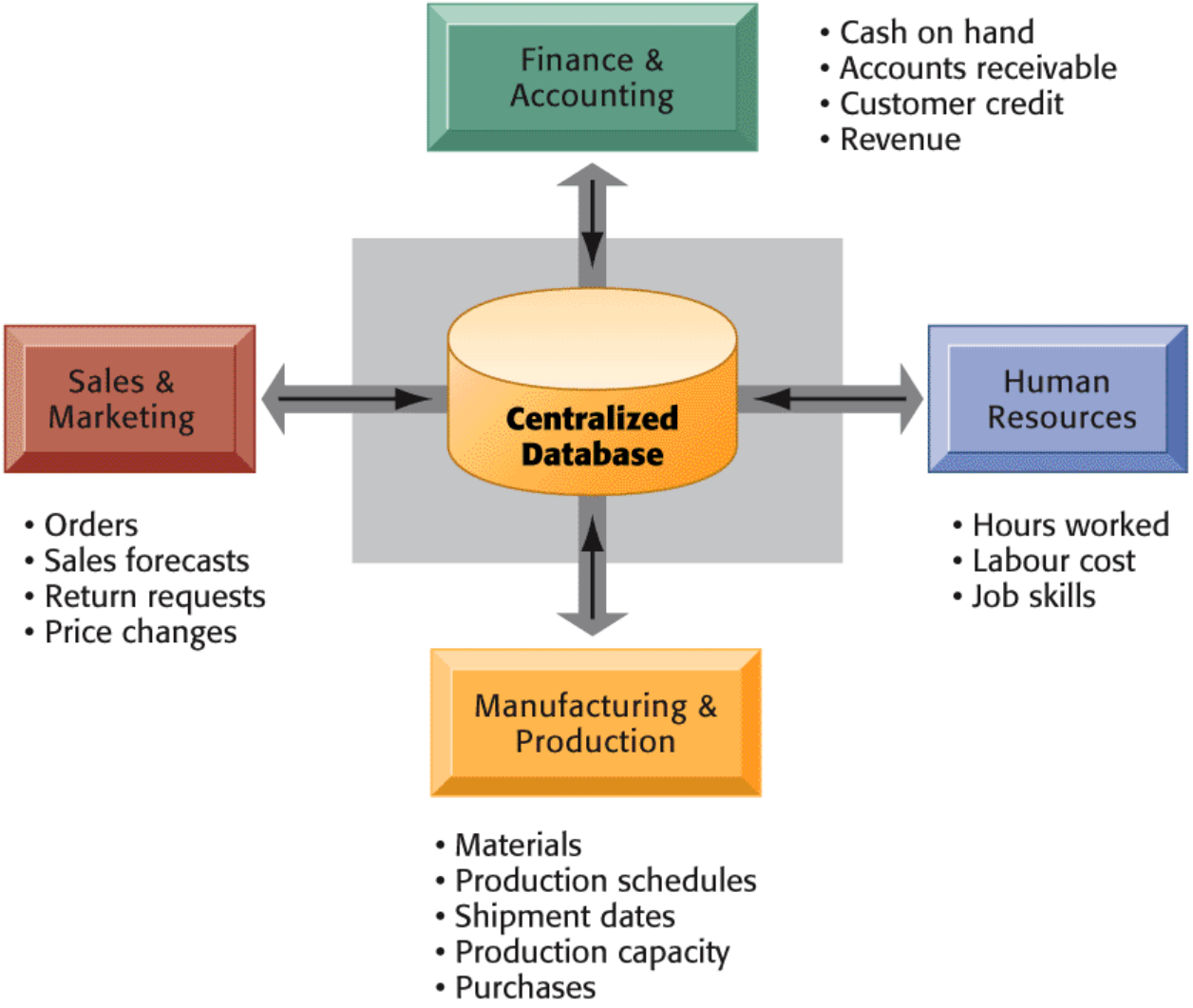
Enterprise Resource Planning

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
  - More efficient operations and customer-driven business processes
  - Firm-wide information for improved decision making
  - Enterprise Mobile Functionality

ERP Software

- Issues and Challenges in Implementing ERP Systems
  - Business must align processes to the ERP system
  - ERP systems cross 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?)

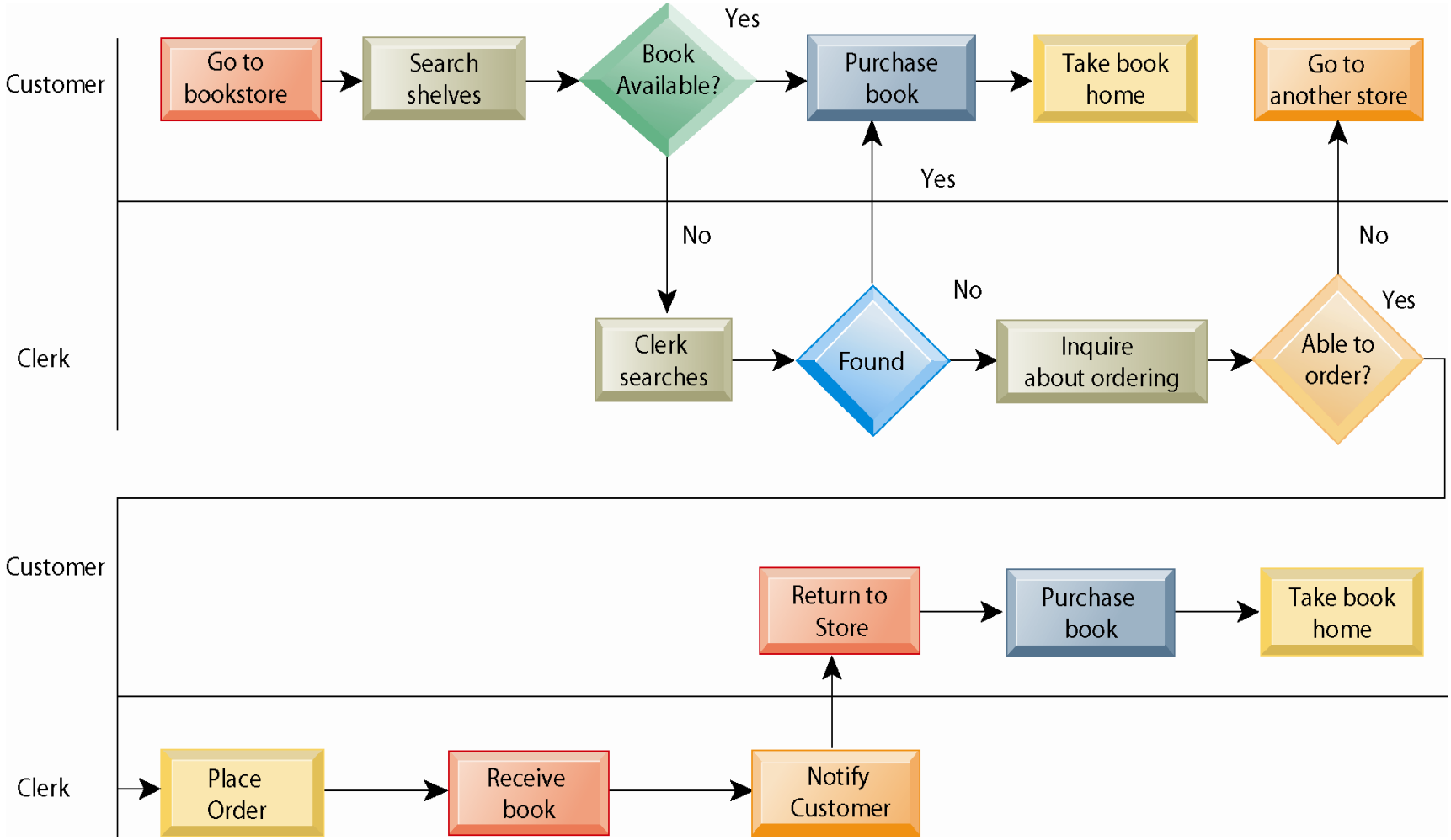
Choosing an ERP System – Selection Factors

- 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

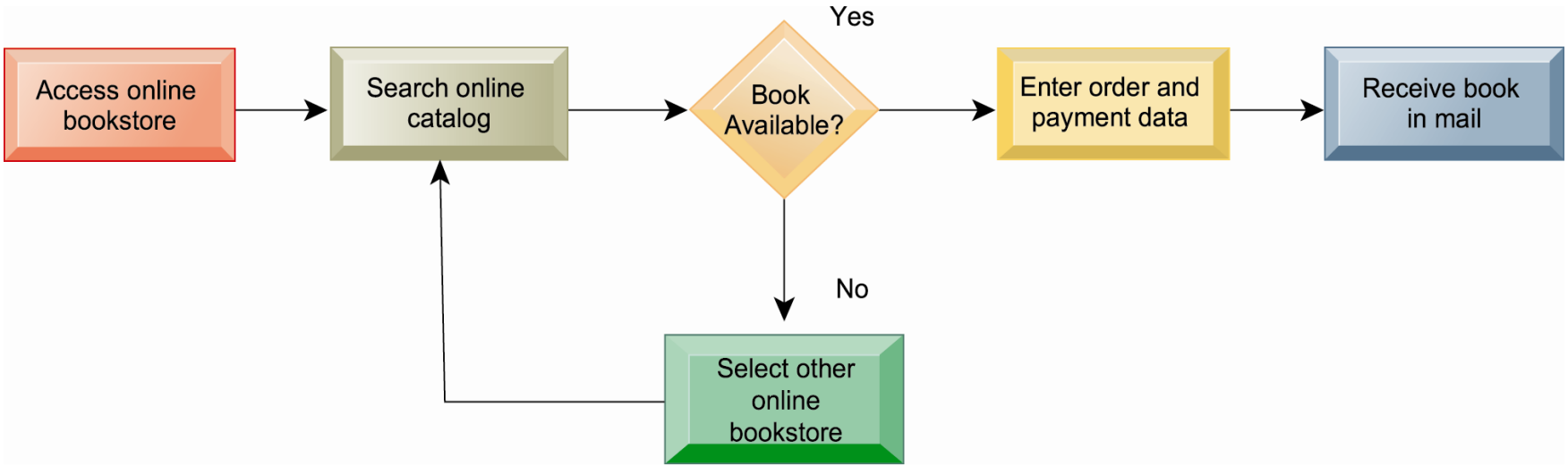
Choosing an ERP System – BPM

- 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

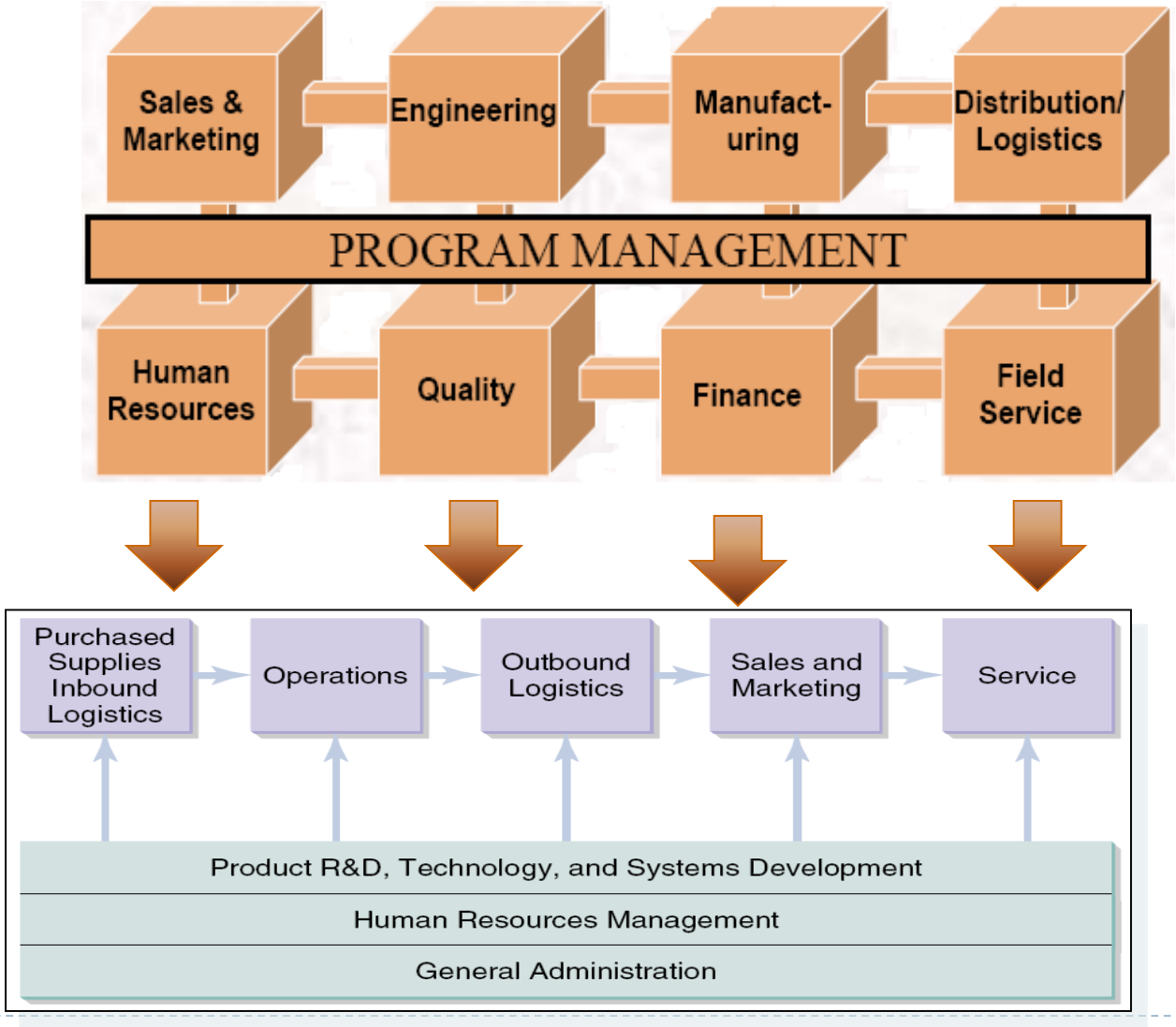
Secure Executive Sponsorship
The highest level support is required to obtain resources and make and support difficult reengineering decisions

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

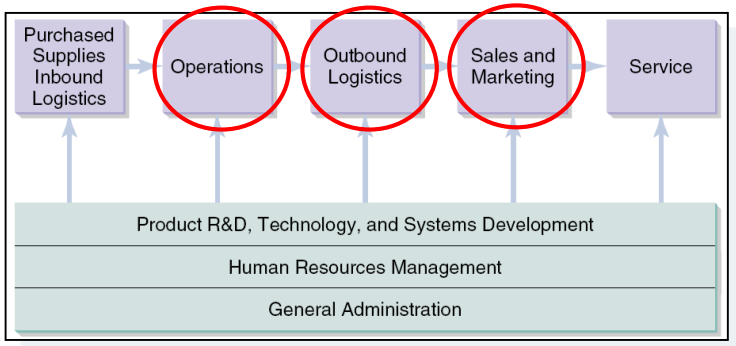
Take a Multidisciplinary Approach to Implementations
Enterprise systems span the entire organization and as such require input and participation from all functions

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

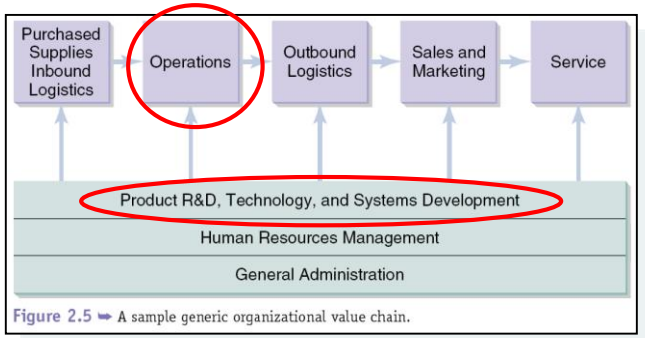


Figure 2.5 ➥ A sample generic organizational value chain.

Manufacturing

- MRPII Functionality
  - MPS, BOM, Routings, MRP, CRP
- Integrated Production Configuration
- Statistical Inventory Control
- Sales & Operations Planning
- Flexible Product & Job Costing Options
- Just-in-Time (JIT)

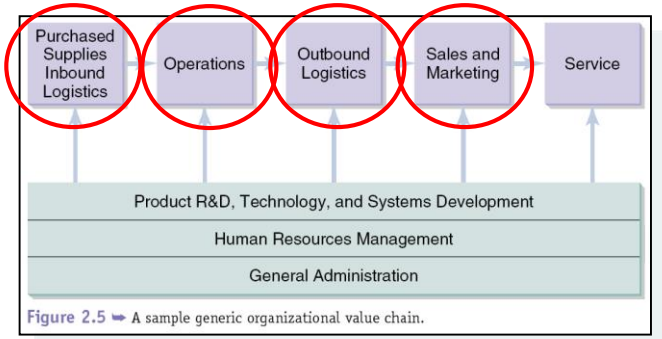


Figure 2.5 ➥ A sample generic organizational value chain.

Distribution / Logistics

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

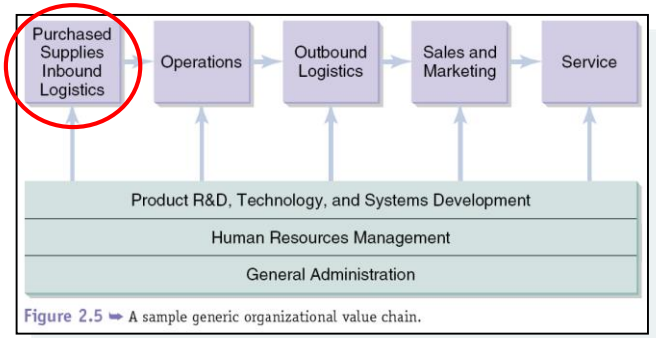


Figure 2.5 ➥ A sample generic organizational value chain.

Human Resources

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

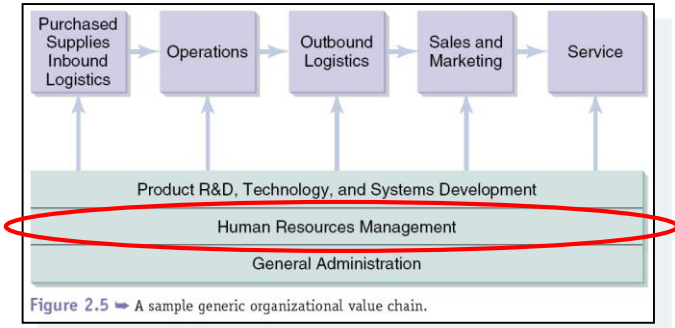


Figure 2.5 ➥ A sample generic organizational value chain.

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

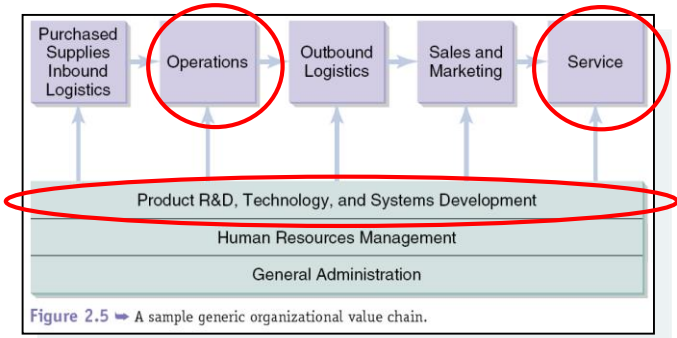


Figure 2.5 ➥ A sample generic organizational value chain.

Finance

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

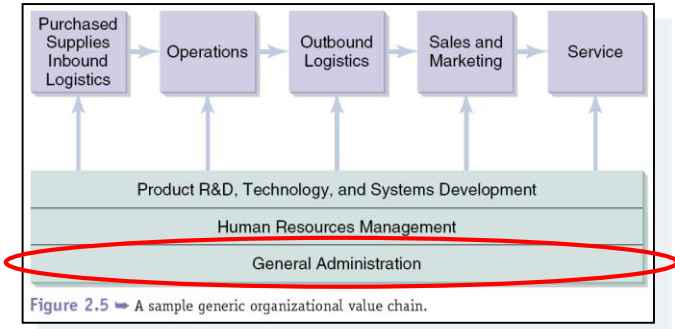
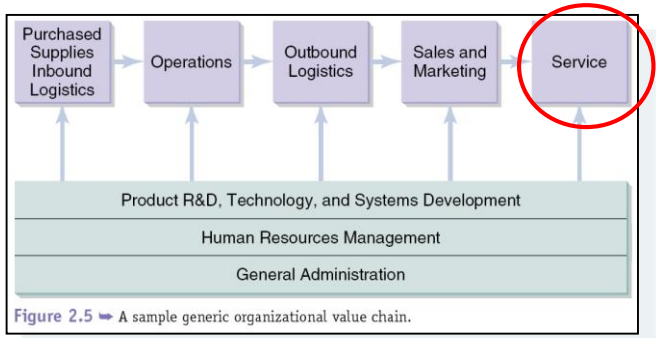


Figure 2.5 ➥ A sample generic organizational value chain.

Field Service

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



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