Business Systems and Applications

MCA 102

Module-I

Foundations of Information Systems in Business

- Information Systems
  - can be any organized combination of people, hardware, software, communications networks, data resources, and policies and procedures that stores, retrieves, transforms, and disseminates information in an organization.
  - Variety of physical devices *(hardware)* , information processing instructions and procedures *(software)* , communications channels *(networks)* , and stored data *(data resources).*

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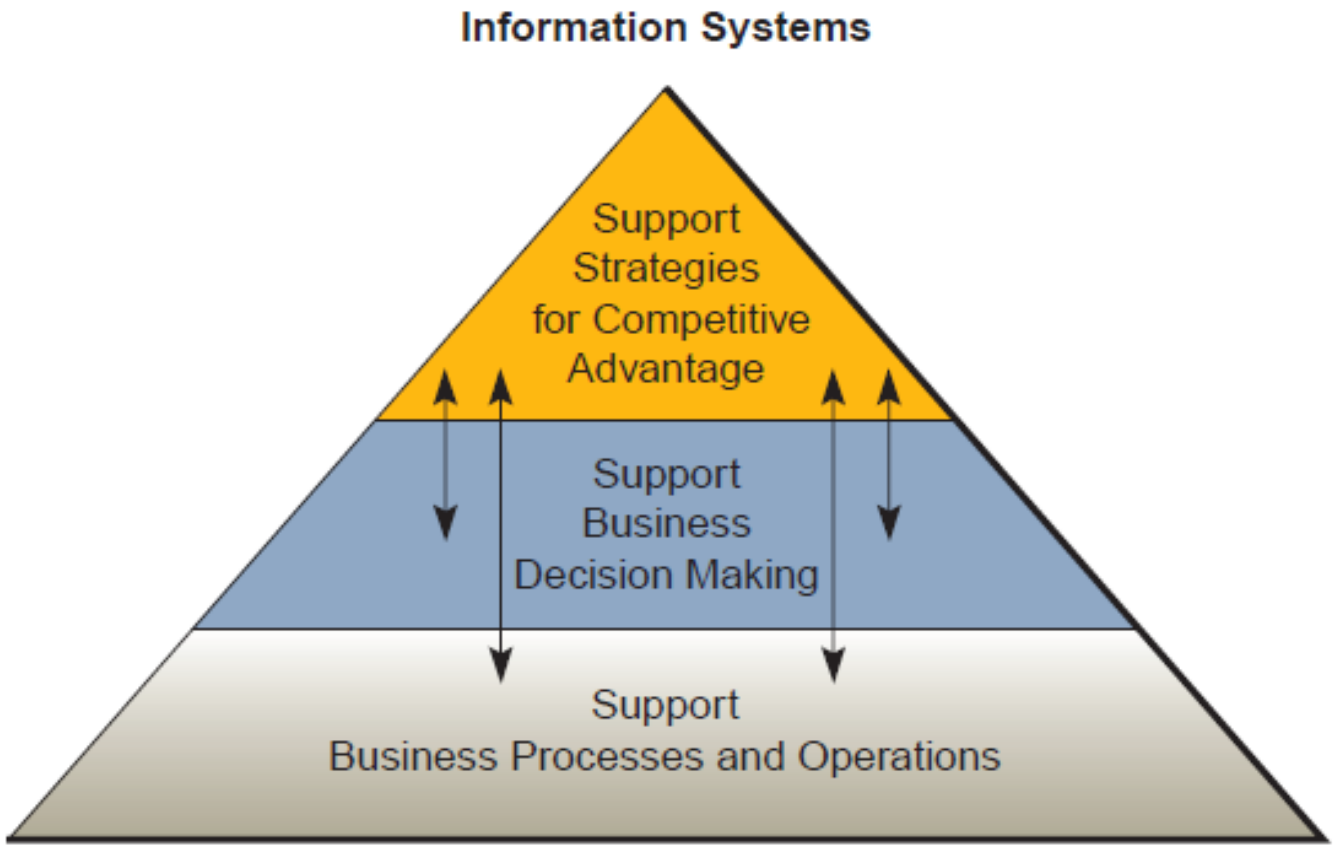
- How do information technologies contribute to the business success of the companies?
  - eCourier, SeeWhy

- Amazon
- Flipcart
- Billing System used in shopping malls etc.

Fundamental Roles of IS in Business Applications



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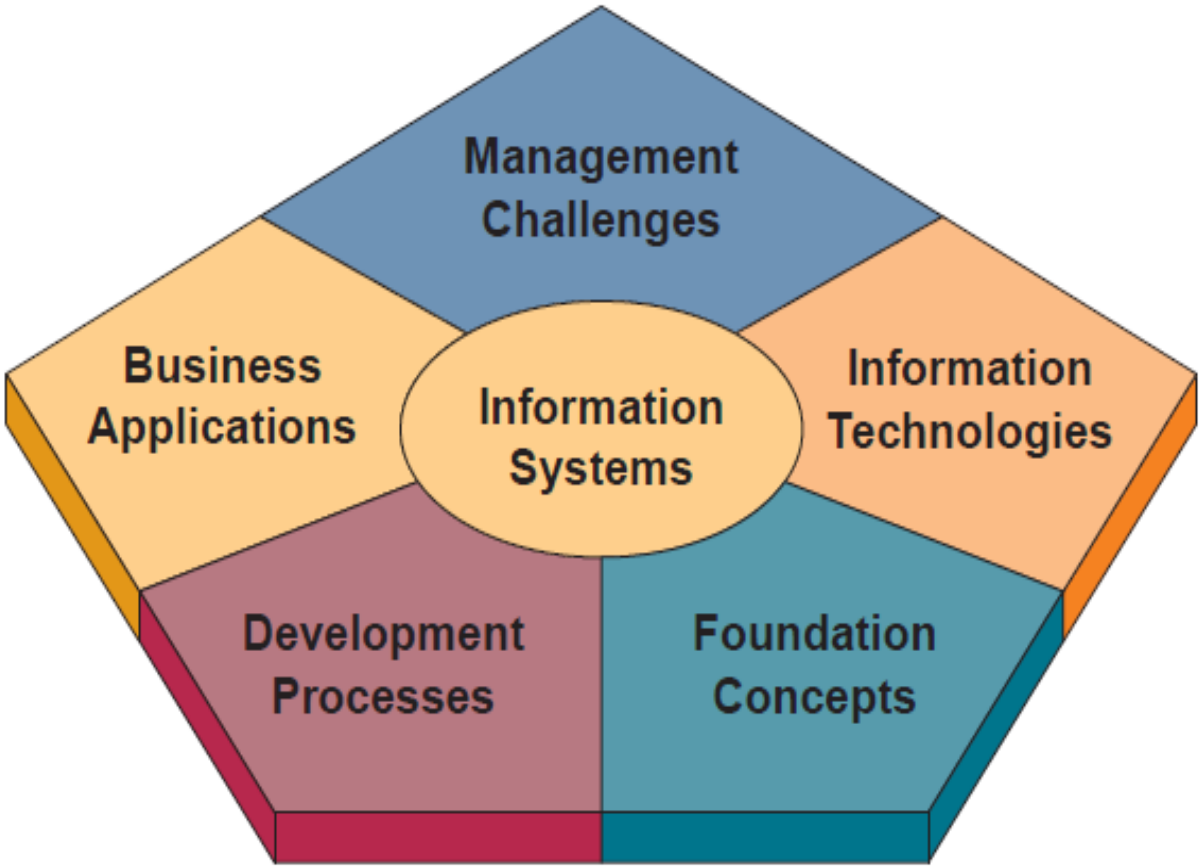
- Support of business processes and operations.
  - Computer Based Information System in retail stores.
- Support of Business Decision Making
  - Investment Decisions. Where to invest & where not based on market analysis.
  - Advantage over other retailers in the competition for customers.
- Support of Strategies for Competitive Advantage
  - Strategic information systems can help provide products and services that give a business a comparative advantage over its competitors.

Framework of IS in Business



A framework that outlines the major areas of information systems knowledge needed by business professionals.

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- Foundation Concepts
  - Fundamental behavioural, technical, business, and managerial concepts about the components and roles of information systems.
- Information Technologies
  - Hardware, software, networks, data management, and many Internet-based technologies.
- Business Applications
  - Operations management, and competitive advantage, functional areas of business such as marketing, manufacturing, and accounting. e-business applications, and support decision making in business.

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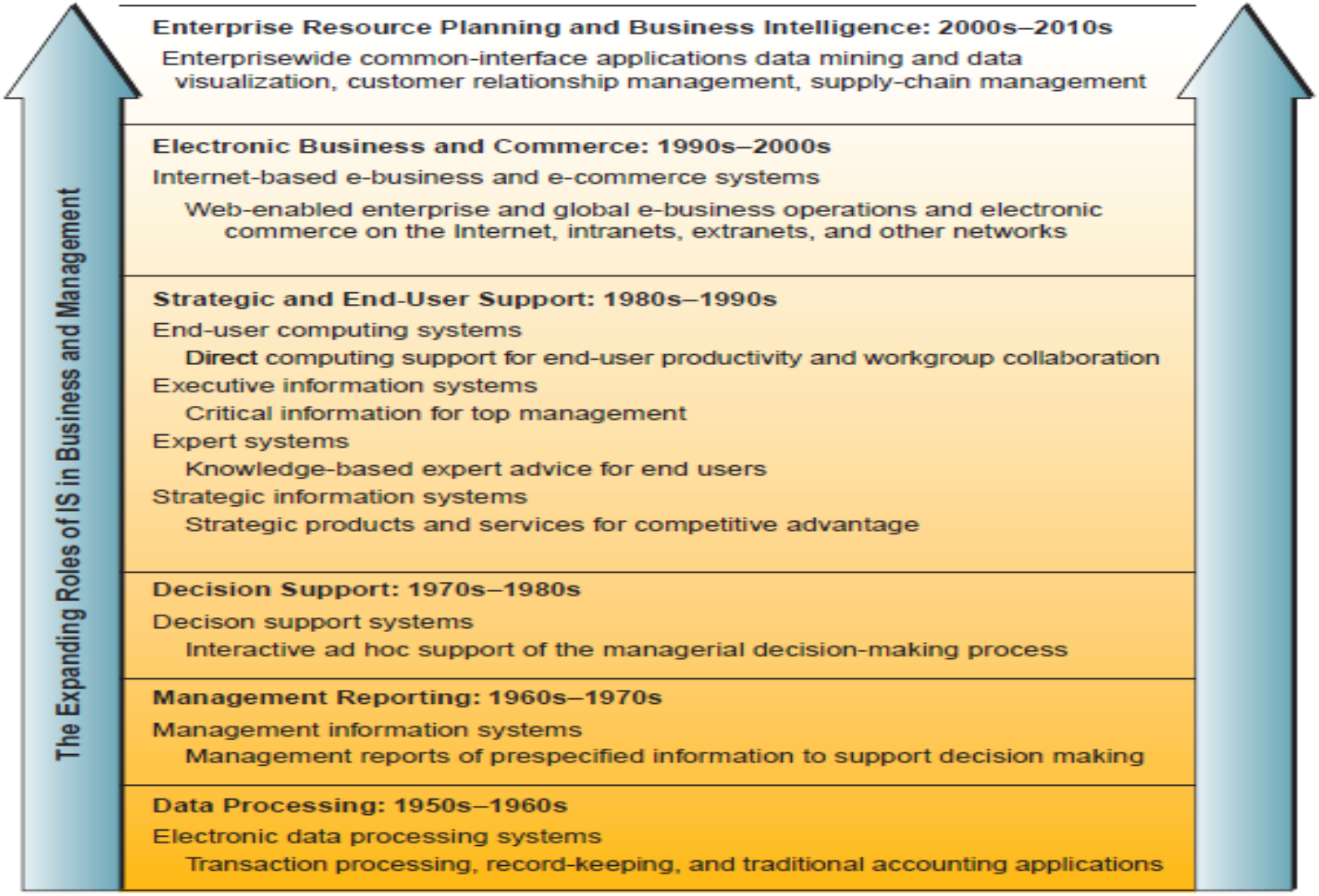
- Development Processes
  - How business professionals and information specialists plan, develop, and implement information systems to meet business opportunities.
- Management Challenges
  - Security challenges and security management issues in the use of information technology.

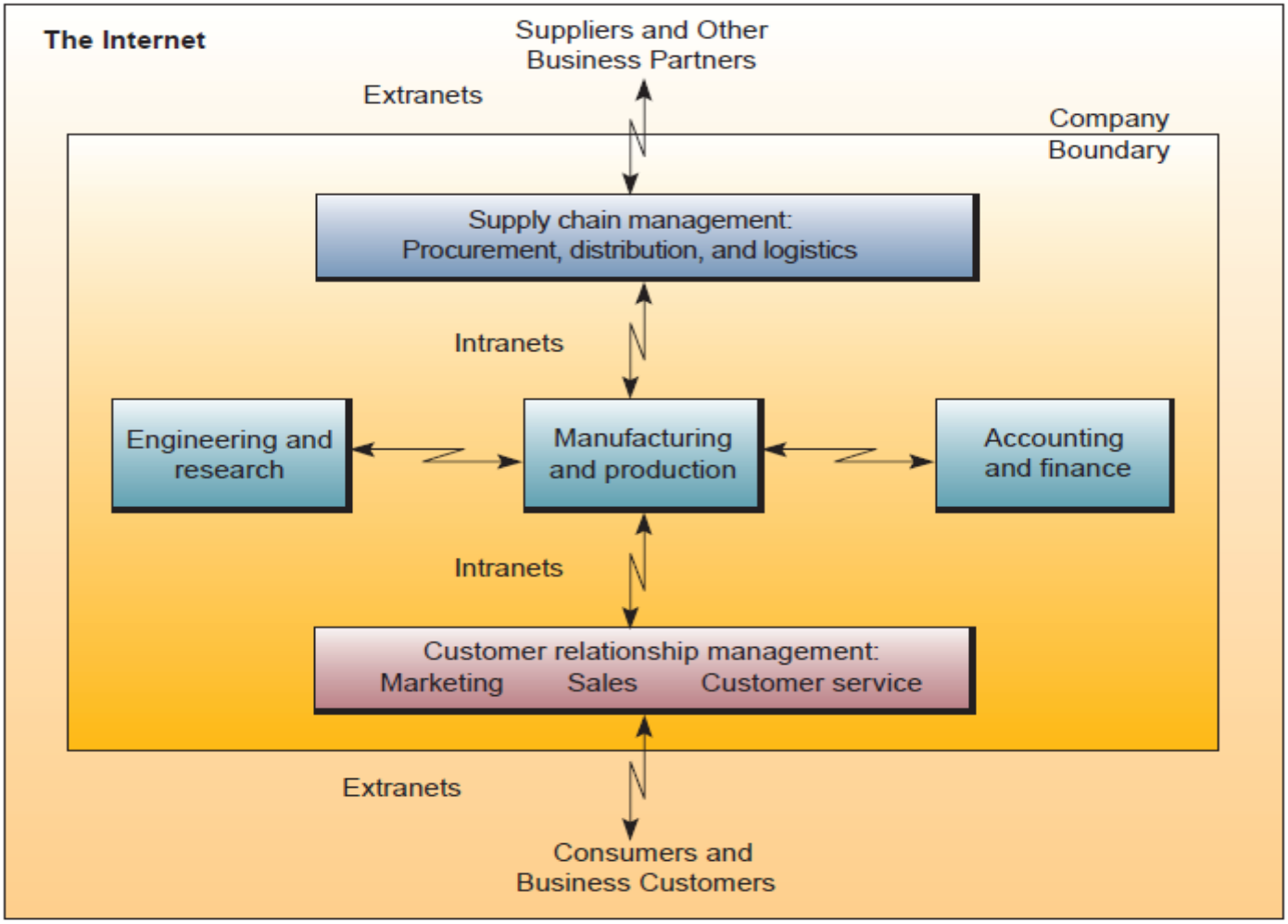
Evolution


The Expanding Roles of IS in Business and Management
Enterprise Resource Planning and Business Intelligence: 2000s–2010s
Enterprisewide common-interface applications data mining and data visualization, customer relationship management, supply-chain management
Electronic Business and Commerce: 1990s–2000s
Internet-based e-business and e-commerce systems
Web-enabled enterprise and global e-business operations and electronic commerce on the Internet, intranets, extranets, and other networks
Strategic and End-User Support: 1980s–1990s
End-user computing systems
Direct computing support for end-user productivity and workgroup collaboration
Executive information systems
Critical information for top management
Expert systems
Knowledge-based expert advice for end users
Strategic information systems
Strategic products and services for competitive advantage
Decision Support: 1970s–1980s
Decison support systems
Interactive ad hoc support of the managerial decision-making process
Management Reporting: 1960s–1970s
Management information systems
Management reports of prespecified information to support decision making
Data Processing: 1950s–1960s
Electronic data processing systems
Transaction processing, record-keeping, and traditional accounting applications

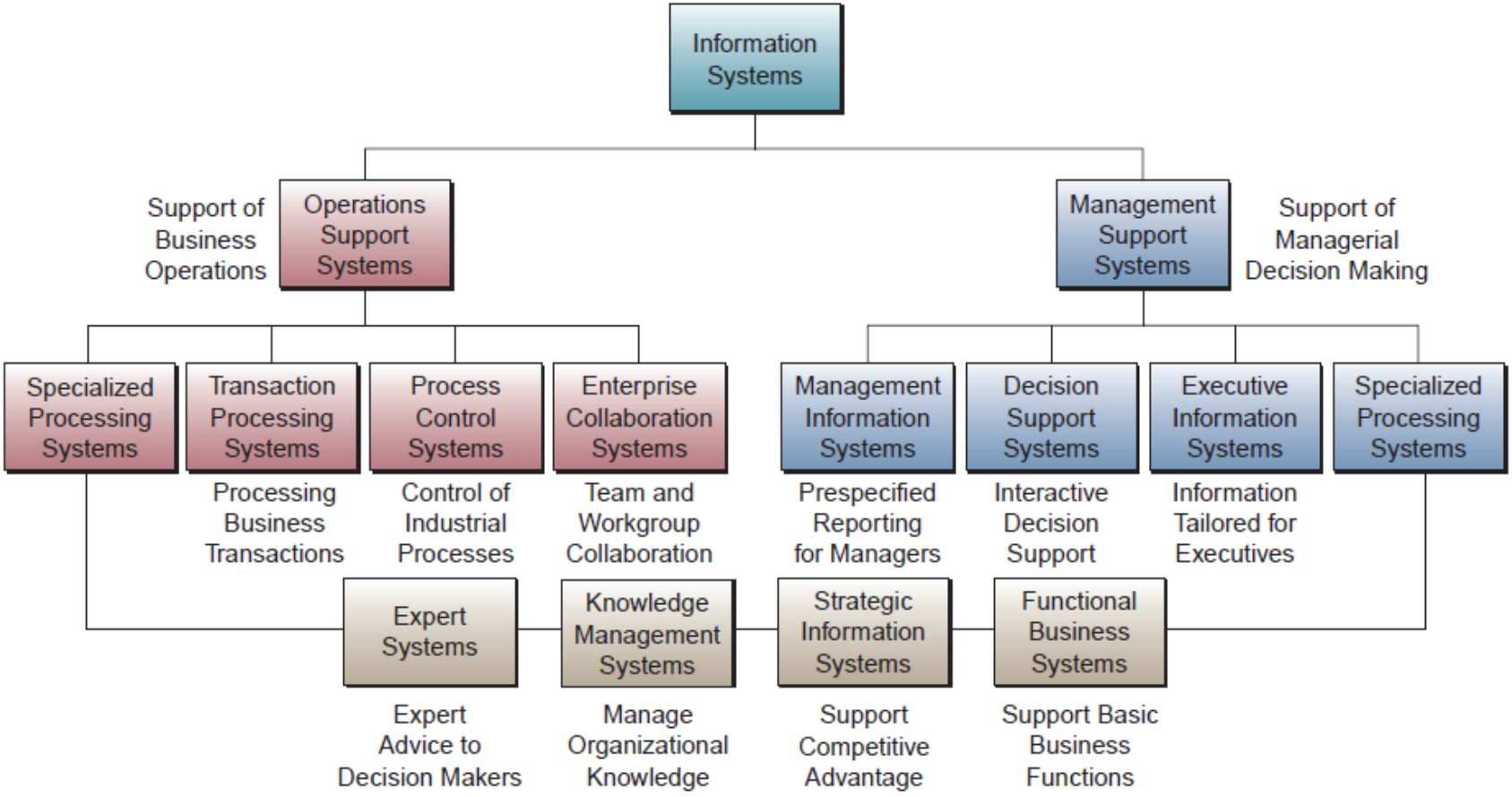
The Fundamental Roles of IS in Business

- Support of business processes and operations.
- Support of decision making by employees and managers.
- Support of strategies for competitive advantage.

Internet in Business Applications



Operations and management classifications of information systems.



Operations Support Systems

- Transaction processing systems.
  - Process data resulting from business transactions, update operational databases, and produce business documents. Examples: sales and inventory processing and accounting systems.
- Process control systems.
  - Monitor and control industrial processes. Examples: petroleum refining, power generation, and steel production systems.
- Enterprise collaboration systems.
  - Support team, workgroup, and enterprise communications and collaborations. Examples: e-mail, chat, and videoconferencing groupware systems.

Management Support Systems

- Management information systems.

  Provide information in the form of pre-specified reports and displays to support business decision making. Examples: sales analysis, production performance, and cost trend reporting systems.

- Decision support systems.

  Provide interactive ad hoc support for the decision-making processes of managers and other business professionals. Examples: product pricing, profitability forecasting, and risk analysis systems.

- Executive information systems.

  Provide critical information from MIS, DSS, and other sources tailored to the information needs of executives. Examples: systems for easy access to analyses of business performance, actions of competitors, and economic developments to support strategic planning.

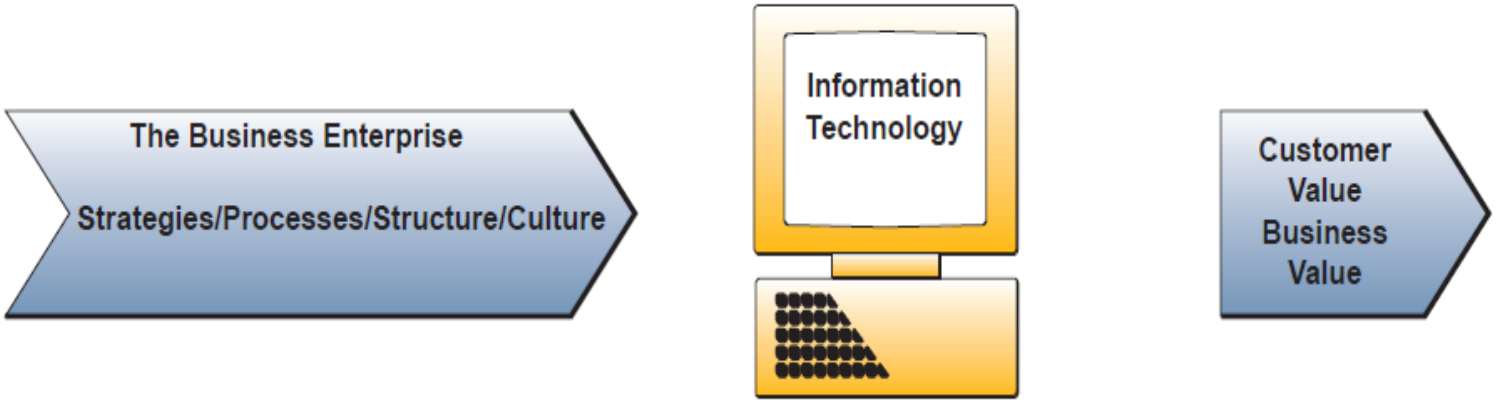
Other Categories of Information Systems

- Expert systems.
  - Knowledge-based systems that provide expert advice and act as expert consultants to users. Examples: credit application advisor, process monitor, and diagnostic maintenance systems.
- Knowledge management systems.

  Knowledge-based systems that support the creation, organization, and dissemination of business knowledge within the enterprise. Examples: intranet access to best business practices, sales proposal strategies, and customer problem resolution systems.

Contd.

- Strategic information systems.
  - Support operations or management processes that provide a firm with strategic products, services, and capabilities for competitive advantage. Examples: online stock trading, shipment tracking, and e-commerce Web systems.
- Functional business systems.
  - Support a variety of operational and managerial applications of the basic business functions of a company. Examples: information systems that support applications in accounting, finance, marketing, operations management, and human resource management.



Business / IT Challenges

- Speed and flexibility requirements of product development, manufacturing, and delivery cycles.
- Reengineering and cross-functional integration of business processes using Internet technologies.
- Integration of e-business and e-commerce into the organization's strategies, processes, structure, and culture.

Business / IT Developments

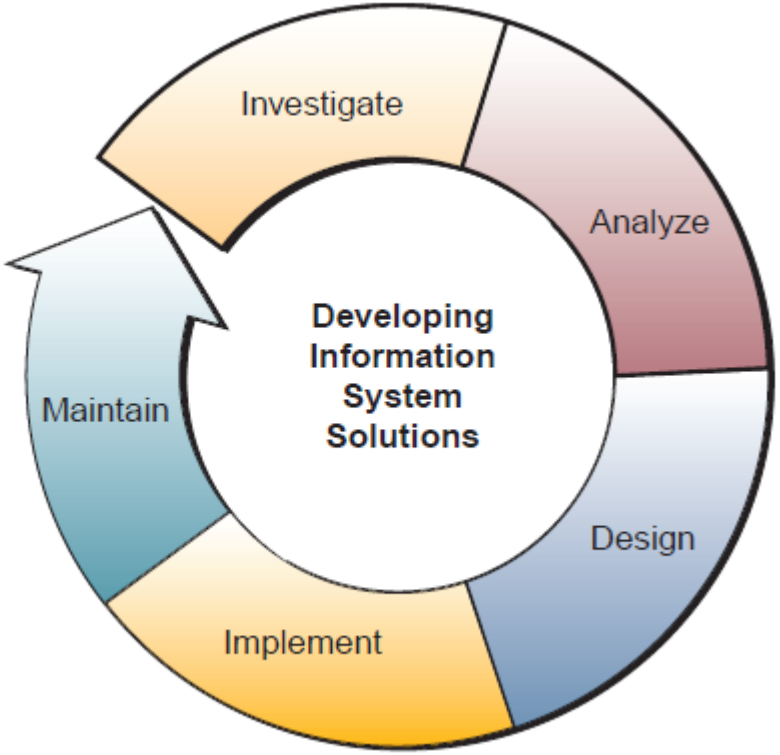
- Use of the Internet, intranets, extranets, and the Web as the primary IT infrastructure.
- Diffusion of Web technology to internetwork employees, customers, and suppliers.
- Global networked computing, collaboration, and decision support systems.

Business / IT Goals

- Give customers what they want, when and how they want it, at the lowest cost.
- Coordination of manufacturing and business processes with suppliers and customers.
- Marketing channel partnerships with suppliers and distributors.

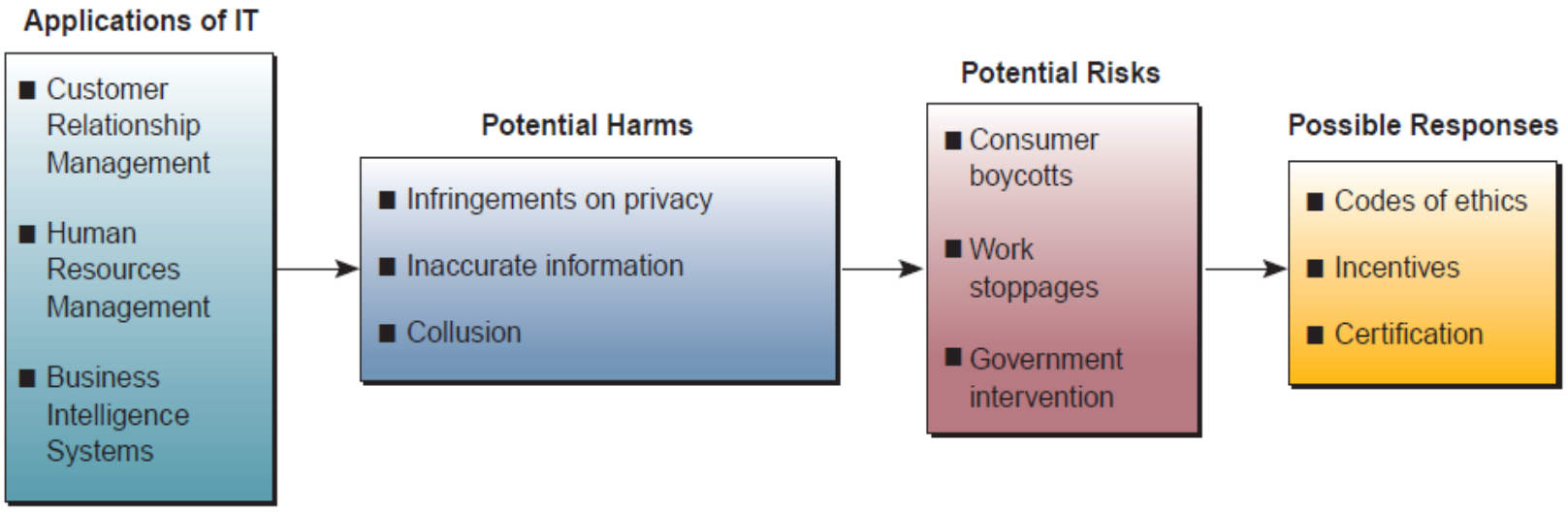
Examples of the challenges and opportunities that business managers face in managing information systems and technologies to meet business goals.

Developing successful information system solutions



Developing information systems solutions to business problems can be implemented and managed as a multistep process or cycle.

Challenges and Ethics of IT



Examples of some of the ethical challenges that must be faced by business managers who implement major applications of information technology.

Challenges of IT Careers

Systems Analyst	System Consultant	Business Applications Consultant
Chief Information Officer	Computer Operator	Computer Serviceperson
Network Administrator	Data Dictionary Specialist	Network Manager
Database Administrator	Database Analyst	Documentation Specialist
IS Auditor	End-User Computer Manager	Equipment Manufacturer Representative
PC Sales Representative	Programmer	Program Librarian
Project Manager	Records Manager	Hardware Sales Representative
Scheduling and Control Person	Security Officer	Office Automation Specialist
Senior Project Leader	Service Sales Representative	Software Sales Representative
Technical Analyst	Software Quality Evaluator	Technical Writer
Telecommunications Specialist	Training & Standards Manager	User Interface Specialist

Careers in IS are as diverse and exciting as the technologies used in them; IS professionals have career opportunities in every business environment and activity throughout the world.

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- *People with management skills and an understanding of business practices and principles will have excellent opportunities, as companies are increasingly looking to technology to drive their revenue. (Bureau of Labor Statistics Occupational Outlook Handbook,2008–2009)*
- "cyber security"—the protection of electronic information

The IS Function

- A major functional area of business equally as important to business success as the functions of accounting, finance, operations management, marketing, and human resource management.
- An important contributor to operational efficiency, employee productivity and morale, and customer service and satisfaction.
- A recognized source of value to the firm.
- A major source of information and support needed to promote effective decision making by managers and business professionals.
- developing competitive products and services that give an organization a strategic advantage in the global marketplace.
- A dynamic, rewarding, and challenging career opportunity for millions of men and women.
- • A key component of the resources, infrastructure, and capabilities of today's networked business enterprises.
- • A strategic resource.

Foundation Concepts: The Components of Information Systems

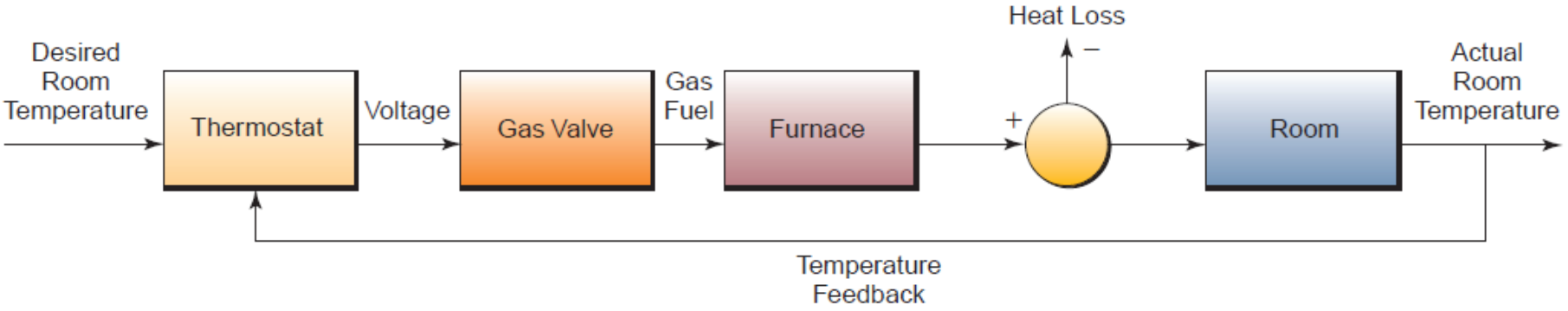
- **Technology.** Computer networks are systems of information processing components that use a variety of hardware, software, data management, and telecommunications network technologies.
- **Applications.** E-business and e-commerce applications involve interconnected business information systems.
- **Development.** Developing ways to use information technology in business includes designing the basic components of information systems.
- **Management.** Managing information technology emphasizes the quality, strategic business value, and security of an organization's information systems.

What Is a System?

- *a set of interrelated components, with a clearly defined boundary, working together to achieve a common set of objectives by accepting inputs and producing outputs in an organized transformation process .*
- Functions- **Input-** raw materials, energy, data, and human effort must be secured and organized for processing etc.
- **Processing -** manufacturing processes etc.
- **Output -** finished products, human services etc.

Feedback and Control

- Cybernetic system or self monitoring system
- Feedback is data about the performance of a system
- Control involves monitoring and evaluating feedback to determine whether a system is moving toward the achievement of its goal.



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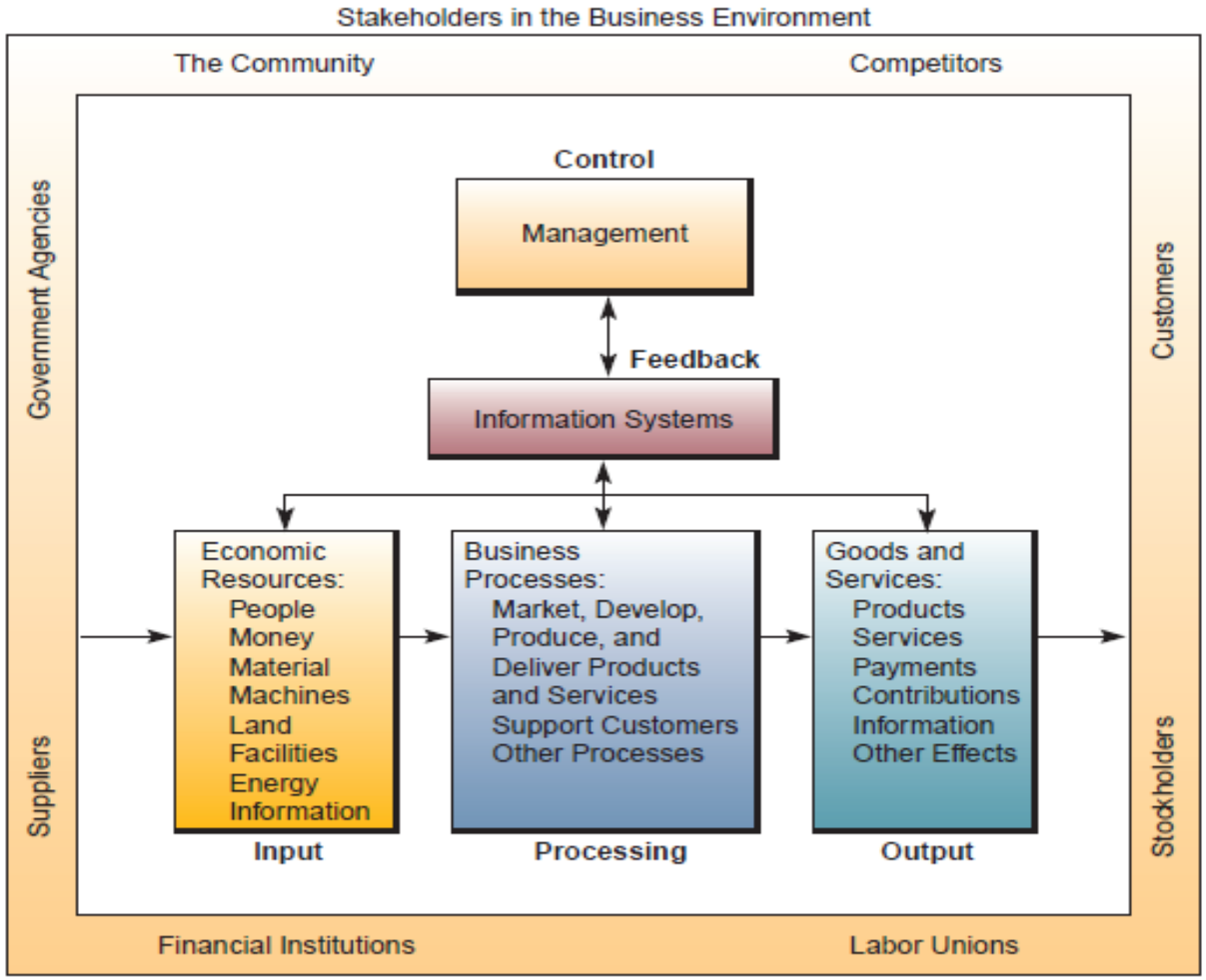
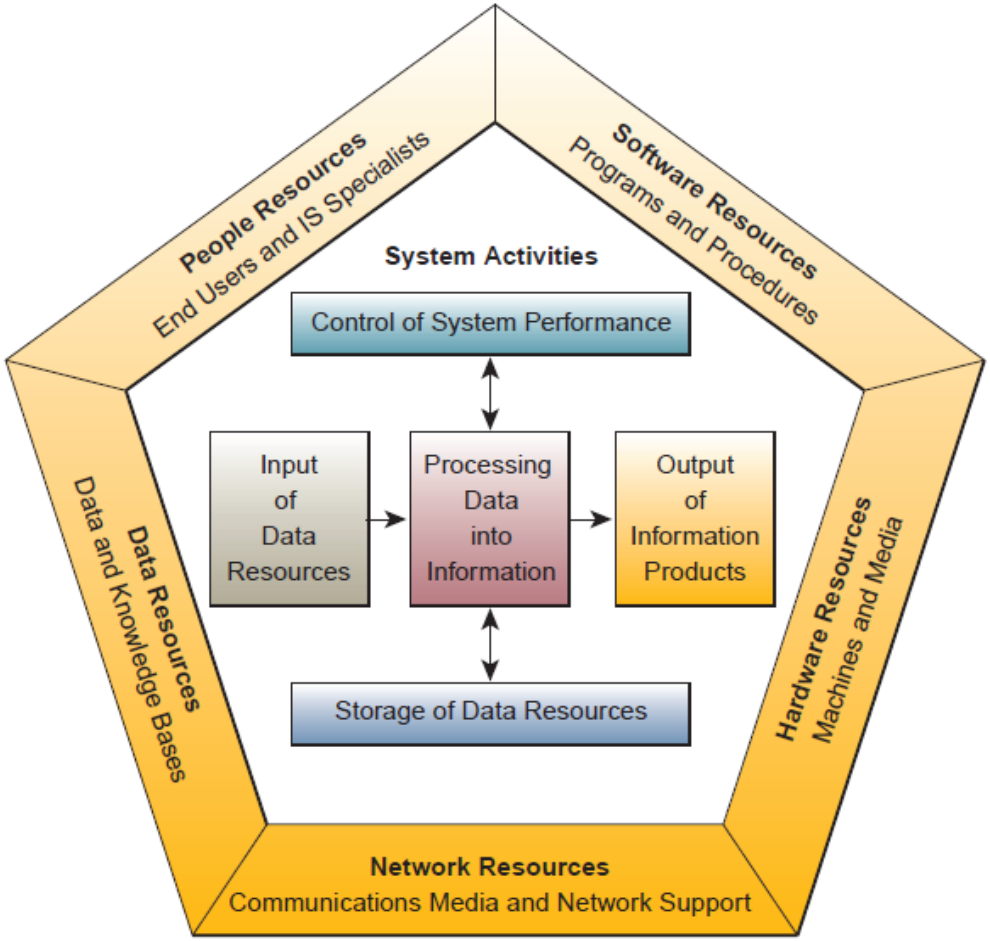
A business is an example of an organizational system in which economic resources (input) are transformed by various business processes (processing) into goods and services (output). Information systems provide information(feedback) about the operations of the system to management for the direction and maintenance of the system (control) as it exchanges inputs and outputs with its environment



Components of IS



IS Resources

- Five major resources
  - People
  - Hardware
  - Software
  - Data
  - Networks

People Resources

- End Users
  - customers, salespersons, engineers etc.
- Knowledge workers
  - people who spend most of their time communicating and collaborating in teams and workgroups and creating, using, and distributing information
- IS Specialists
  - People who develop and operate information systems

Hardware Resources

- Computer systems
  - laptop, tablet, or desktop, microcomputer systems etc.
- Computer peripherals
  - Keyboard, Mouse, USB drive etc.

Software Resources

- System software
  - Operating Systems [Windows , Unix etc.]
- Application software
  - Microsoft Office Suite, Pdf viewer, Tally etc.
- Procedures
  - Instructions for filling out a paper form or using a software package.

Data Resources

- Databases that hold processed and organized data.
- Knowledge bases that hold knowledge in a variety of forms, such as facts, rules etc.

Network Resources

- Communications media
  - twisted-pair wire, coaxial and fiber-optic cables etc.
- Network infrastructure
  - Modems, communications control software, network operating systems and Internet browser packages etc.

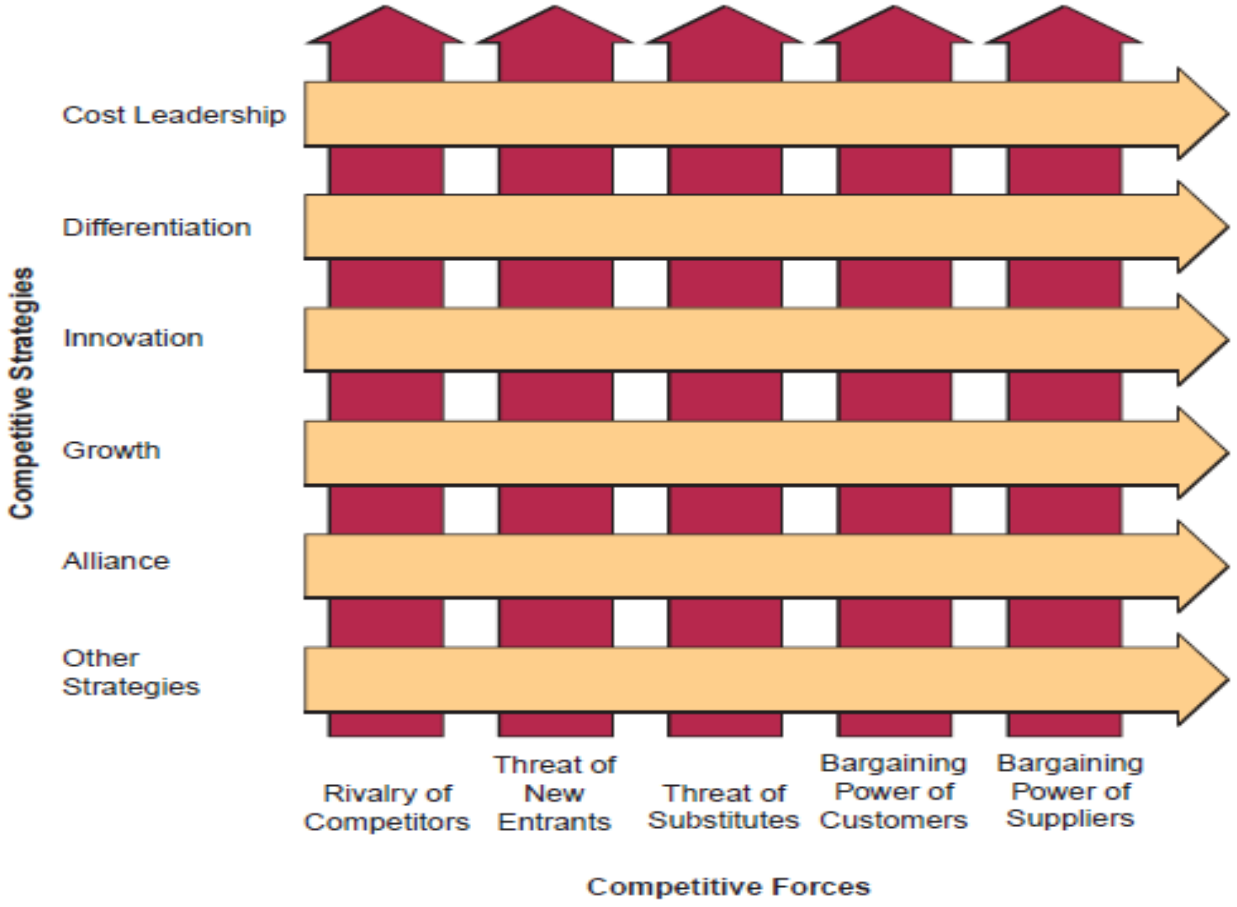
IS Resources

Information System Resources and Products
People Resources Specialists—systems analysts, software developers, systems operators. End Users—anyone else who uses information systems.
Hardware Resources Machines—computers, video monitors, magnetic disk drives, printers, optical scanners. Media—floppy disks, magnetic tape, optical disks, plastic cards, paper forms.
Software Resources Programs—operating system programs, spreadsheet programs, word processing programs, payroll programs. Procedures—data entry procedures, error correction procedures, paycheck distribution procedures.
Data Resources Product descriptions, customer records, employee files, inventory databases.
Network Resources Communications media, communications processors, network access, control software.
Information Products Management reports and business documents using text and graphics displays, audio responses, and paper forms.

Information System Activities

- **Input.** Optical scanning of bar-coded tags on merchandise.
- **Processing.** Calculating employee pay, taxes, and other payroll deductions.
- **Output.** Producing reports and displays about sales performance.
- **Storage.** Maintaining records on customers, employees, and products.
- **Control.** Generating audible signals to indicate proper entry of sales data.

Strategic IT/Competitive Strategy



Basic Strategies in the Business Use of Information Technology
Lower Costs • Use IT to substantially reduce the cost of business processes. • Use IT to lower the costs of customers or suppliers.
Differentiate • Develop new IT features to differentiate products and services. • Use IT features to reduce the differentiation advantages of competitors. • Use IT features to focus products and services at selected market niches.
Innovate • Create new products and services that include IT components. • Develop unique new markets or market niches with the help of IT. • Make radical changes to business processes with IT that dramatically cut costs; improve quality, efficiency, or customer service; or shorten time to market.
Promote Growth • Use IT to manage regional and global business expansion. • Use IT to diversify and integrate into other products and services.
Develop Alliances • Use IT to create virtual organizations of business partners. • Develop interenterprise information systems linked by the Internet and extranets that support strategic business relationships with customers, suppliers, subcontractors, and others.

A summary of how information technology can be used to implement the five basic competitive strategies.

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Other Strategic Uses of Information Technology
• Develop interenterprise information systems whose convenience and efficiency create switching costs that lock in customers or suppliers.
• Make major investments in advanced IT applications that build barriers to entry against industry competitors or outsiders.
• Include IT components in products and services to make substitution of competing products or services more difficult.
• Leverage investment in IS people, hardware, software, databases, and networks from operational uses into strategic applications.

Additional ways that information technology can be used to implement competitive strategies

Strategy	Company	Strategic Use of Information Technology	Business Benefit
Cost Leadership	Dell Computer	Online build to order	Lowest-cost producer
	Priceline.com	Online seller bidding	Buyer-set pricing
	eBay.com	Online auctions	Auction-set prices
Differentiation	AVNET Marshall	Customer/supplier of e-commerce	Increase in market share
	Moen Inc.	Online customer design	Increase in market share
	Consolidated Freightways	Customer online shipment tracking	Increase in market share
Innovation	Charles Schwab & Co.	Online discount stock trading	Market leadership
	Federal Express	Online package tracking and flight management	Market leadership
	Amazon.com	Online full-service customer systems	Market leadership
Growth	Citicorp	Global intranet	Increase in global market
	Walmart	Merchandise ordering by global satellite network	Market leadership
	Toys 'R' Us Inc.	POS inventory tracking	Market leadership
Alliance	Walmart/Procter & Gamble	Automatic inventory replenishment by supplier	Reduced inventory cost/increased sales
	Cisco Systems	Virtual manufacturing alliances	Agile market leadership
	Staples Inc. and Partners	Online one-stop shopping with partners	Increase in market share

Examples of how, over time, companies have used information technology to implement five competitive strategies for strategic advantage.

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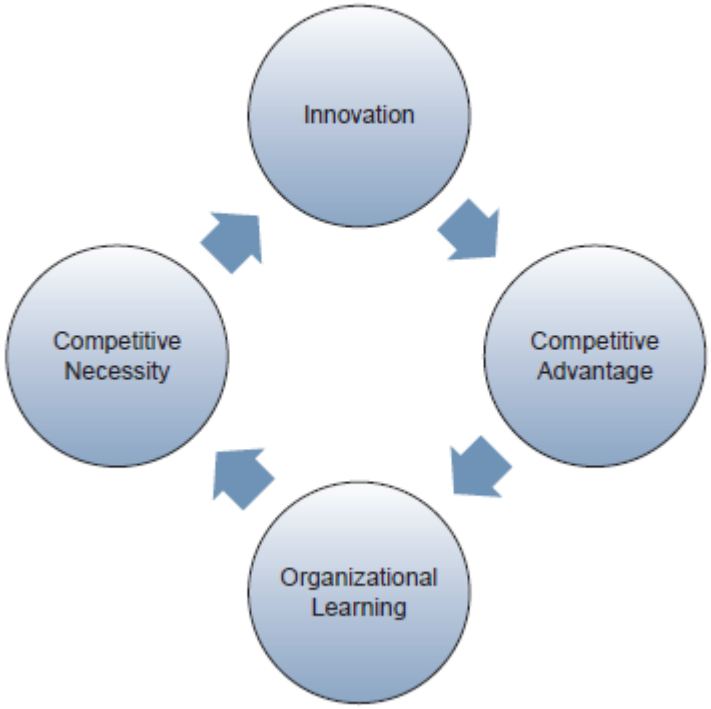
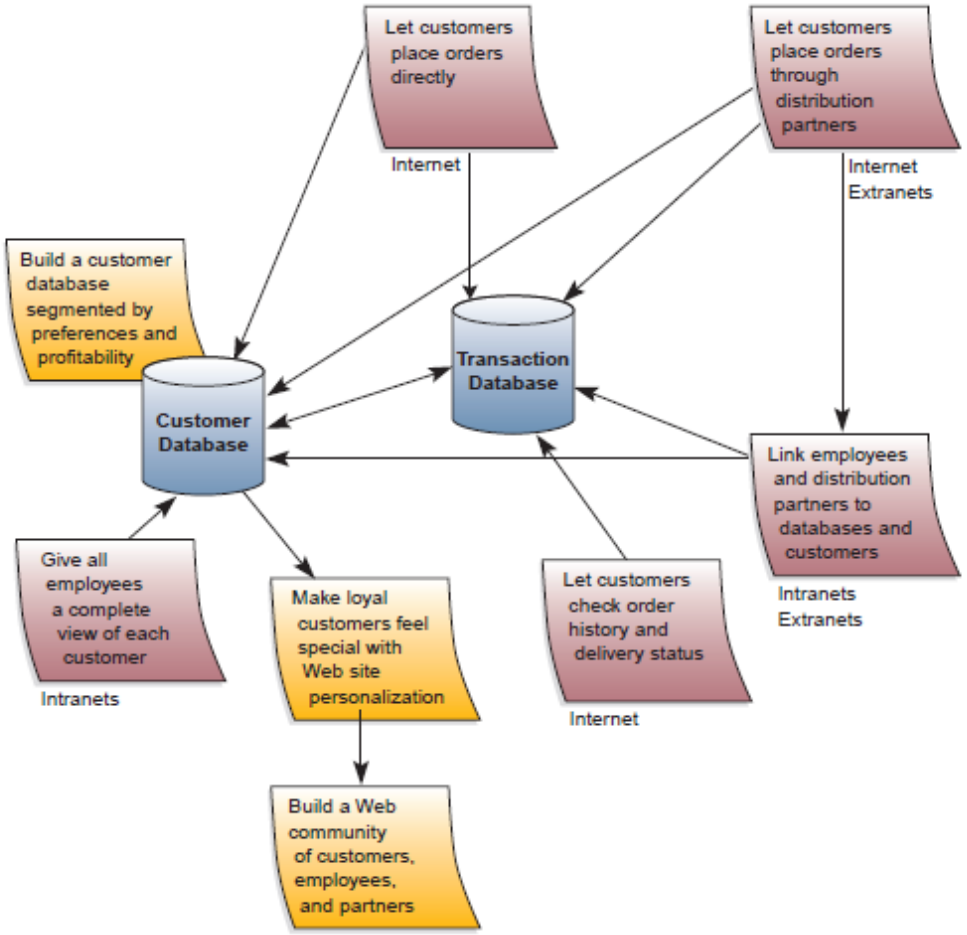
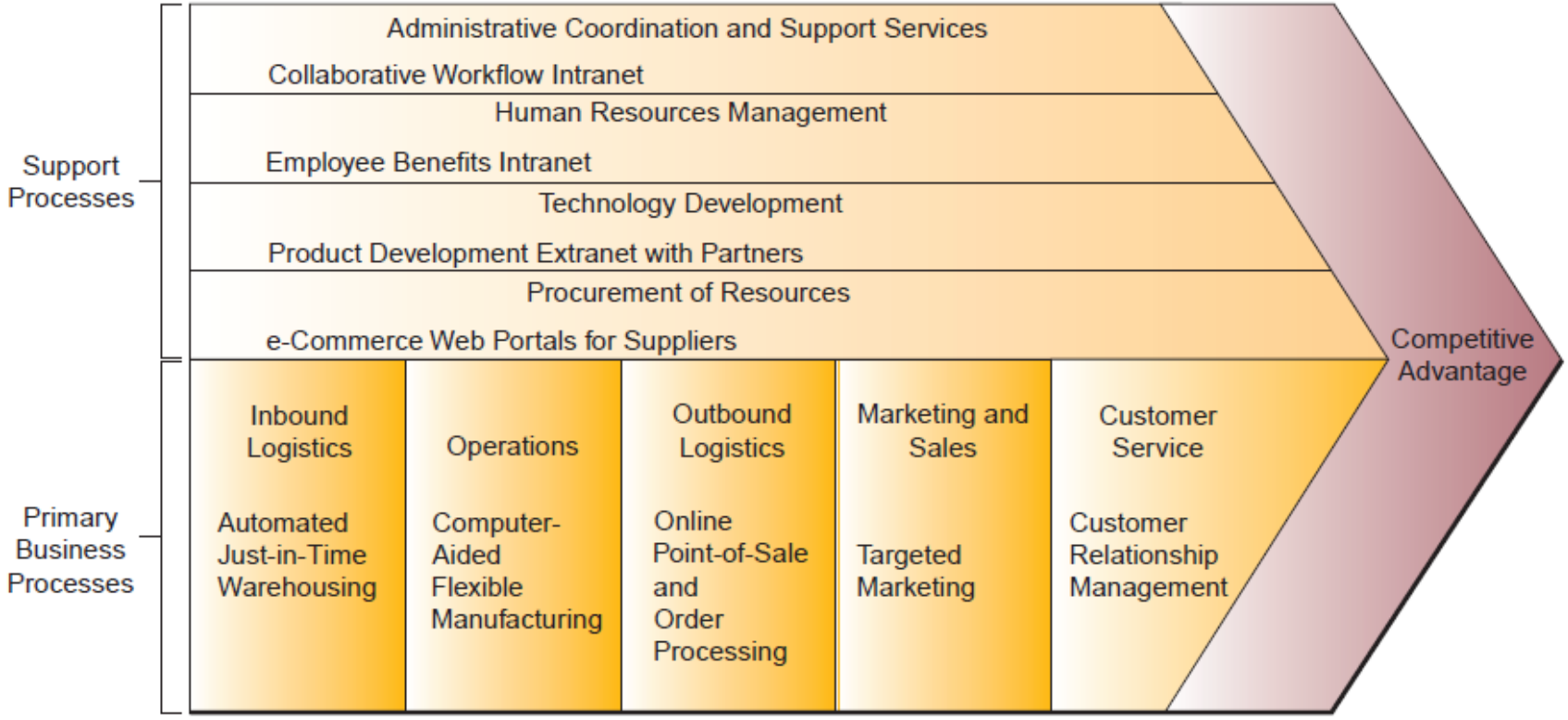


The move from innovation to competitive advantage quickly becomes competitive necessity when other firms learn how to respond strategically.

Customer Focused Business



The Value Chain & Strategic IS



The value chain Concept, developed by Michael Porter

Re-engineering

- One of the most important implementations of competitive strategies is business process reengineering (BPR), often simply called *reengineering* .
- Reengineering is a fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in cost, quality, speed, and service.
- Ex- Cross-functional enterprise resource planning (ERP) software
- IT in reengineering- Smartphone Mobile Applications.

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	Business Improvement	Business Process Reengineering
Level of Change	Incremental	Radical
Process Change	Improved new version of process	Brand-new process
Starting Point	Existing processes	Clean slate
Frequency of Change	One-time or continuous	Periodic one-time change
Time Required	Short	Long
Typical Scope	Narrow, within functions	Broad, cross-functional
Horizon	Past and present	Future
Participation	Bottom-up	Top-down
Path to Execution	Cultural	Cultural, structural
Primary Enabler	Statistical control	Information technology
Risk	Moderate	High

Source: Adapted from Howard Smith and Peter Fingar, *Business Process Management: The Third Wave* (Tampa, FL: Meghan-Kiffer Press, 2003), p. 118.

Some of the key ways that business process reengineering differs from business improvement.

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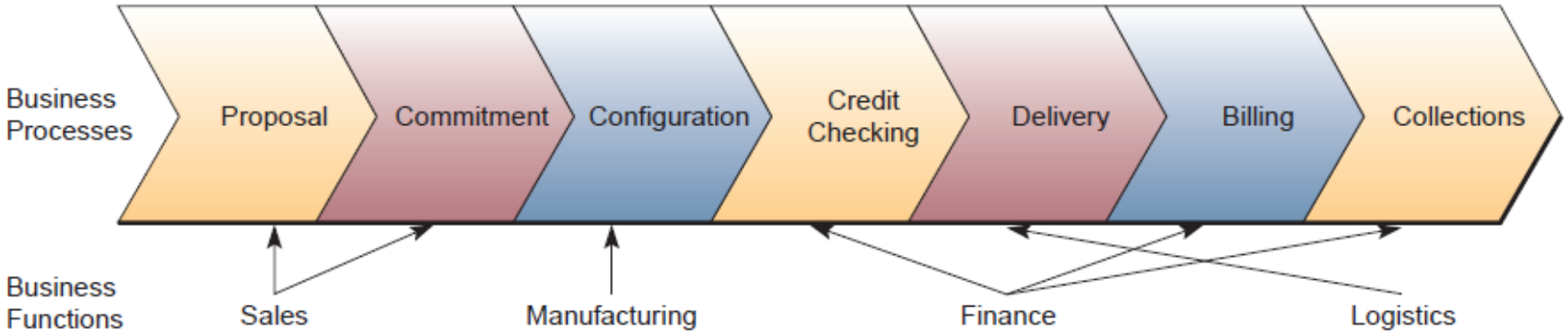

The order management process consists of several business processes and crosses the boundaries of traditional business functions.

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Reengineering Order Management
• Customer relationship management systems using corporate intranets and the Internet.
• Supplier-managed inventory systems using the Internet and extranets.
• Cross-functional ERP software for integrating manufacturing, distribution, finance, and human resource processes.
• Customer-accessible e-commerce Web sites for order entry, status checking, payment, and service.
• Customer, product, and order status databases accessed via intranets and extranets by employees and suppliers.

Examples of information technologies that support reengineering the order management processes.

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Type of Agility	Description	Role of IT	Example
Customer	Ability to co-opt customers in the exploitation of innovation opportunities • As sources of innovation ideas • As cocreators of innovation • As users in testing ideas or helping other users learn about the idea	Technologies for building and enhancing virtual customer communities for product design, feedback, and testing	eBay customers are its de facto product development team because they post an average of 10,000 messages each week to share tips, point out glitches, and lobby for changes
Partnering	Ability to leverage assets, knowledge, and competencies of suppliers, distributors, contract manufacturers, and logistics providers in the exploration and exploitation of innovation opportunities	Technologies facilitating interfirm collaboration, such as collaborative platforms and portals, supply chain systems	Yahoo! has accomplished a significant transformation of its service from a search engine into a portal by initiating numerous partnerships to provide content and other media-related services from its Web site
Operational	Ability to accomplish speed, accuracy, and cost economy in the exploitation of innovation opportunities	Technologies for modularization and integration of business processes	Ingram Micro, a global wholesaler, has deployed an integrated trading system allowing its customers and suppliers to connect directly to its procurement and ERP systems

How information technology can help a company be an agile competitor, with the help of customers and business partners.

Virtual Company

- A virtual company (also called a *virtual corporation* or *virtual organization*) is an organization that uses information technology to link people, organizations, assets, and ideas.
- It is the best way to implement key business strategies and alliances that promise to ensure success in today's turbulent business climate
- Ex- National Rail Enquires of UK

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Strategies of Virtual Companies
• Share infrastructure and risk with alliance partners.
• Link complementary core competencies.
• Reduce concept-to-cash time through sharing.
• Increase facilities and market coverage.
• Gain access to new markets and share market or customer loyalty.
• Migrate from selling products to selling solutions.

The basic business strategies of virtual companies.

An organization that uses computer and telecommunications technologies to extend its capabilities by working routinely with employees or contractors located throughout the country or the world. Using email, faxes, instant messaging, data and videoconferencing, it implies a high degree of telecommuting as well as using remote facilities.

The most extreme type of virtual company is one with only "virtual employees" and no central office. Everyone works from home, including top management.

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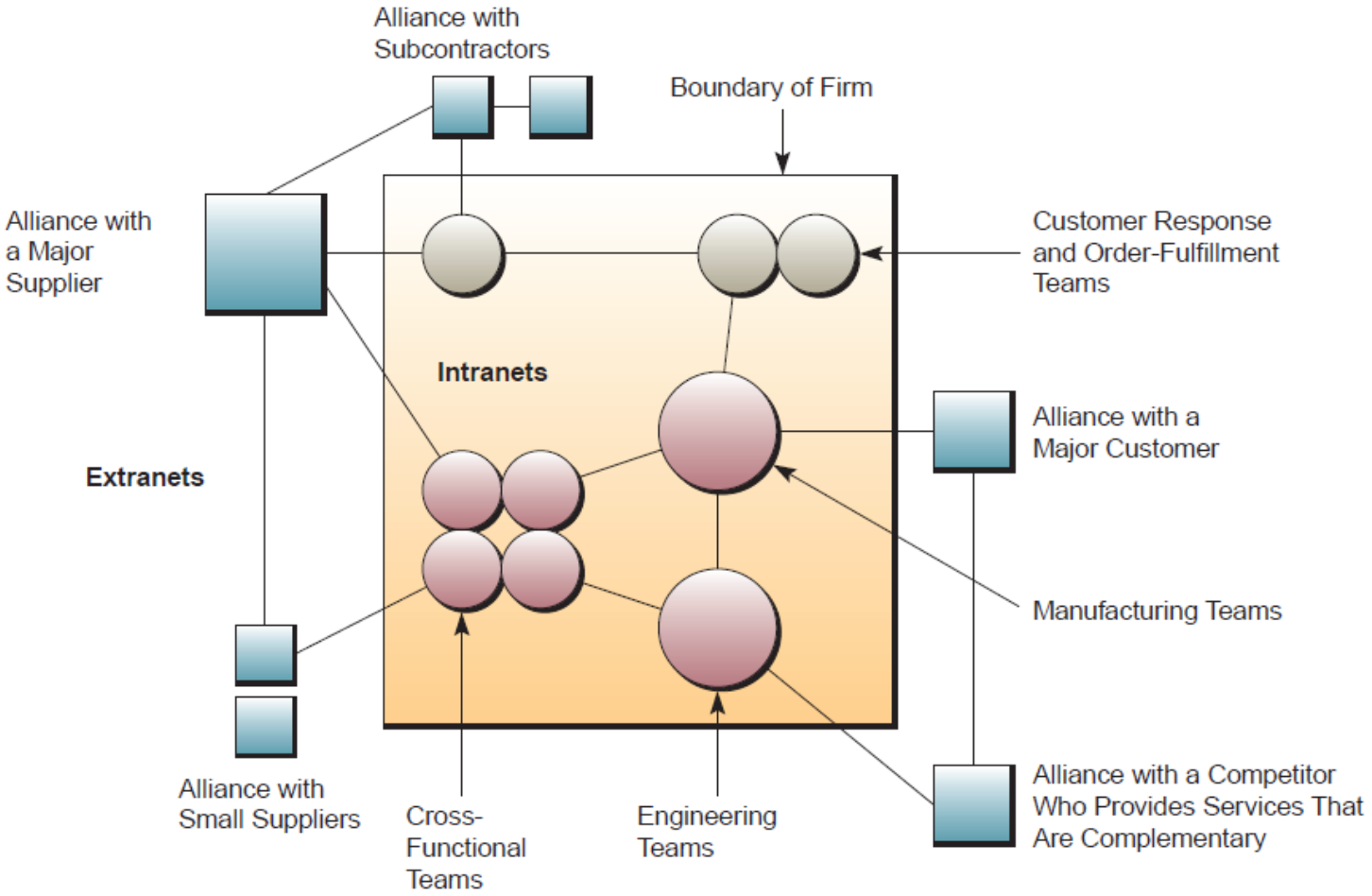


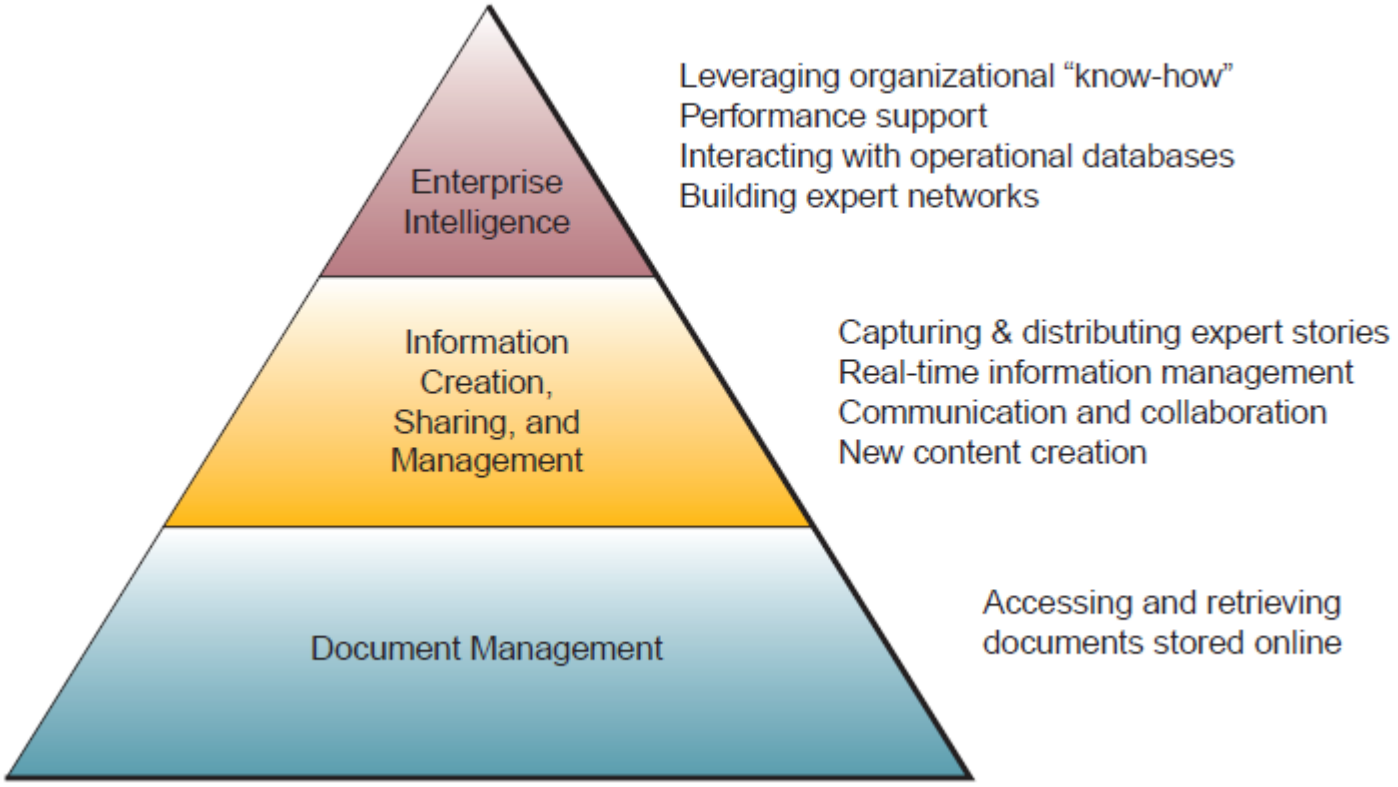
A virtual company, an inter-enterprise information system/s

Knowledge Creating Company

- Knowledge Creating Company/ Learning Organisations
- Continuous Information
- Explicit Knowledge- data, documents, and things written down or stored on computers.
- Tactic Knowledge/“how-tos” of knowledge-

Mainly resides in workers. Ex- Experienced employees/workers

Knowledge Management Systems



Making personal knowledge available to others is the central activity of the knowledge creating company. It takes place continuously and at all levels of the organization .