SCSP 3744
ENTERPRISE SYSTEM DESIGN AND MODELING

CHAPTER 2

1.1 SYSTEM INTEGRATION

System Integration

- Systems integration means
  - Allow a heterogeneous (hodgepodge) IS to communicate or integrate and share information (or data) ***seamlessly*** with one another.

- A key issue for an organization for its growth

- ERP systems are a major kind of enterprise information system allowing organizations to integrate different systems into one organization-wide application with an integrated database management system.

CHAPTER 2

1.1.1 Horizontal and Vertical Silos

Horizontal Silos

- **Silos** - compartmentalized operating units isolated from their environment.

Horizontal Silos

- The POSDCORB (Planning, Organizing, Staffing, Directing, Coordinating, Reporting and Budgeting) categorization by Luther Gulick led to a set of formal organization functions such as control, management, supervision, and administration starting in late 1930s.
- Classification of organizations into departments like Accounting and Human Resources, reflects the breaking of complex tasks into smaller manageable tasks that could be assigned to a group of people who could then be held responsible.

Horizontal Silos

- Classification of organizations into departments
  - E.g: Accounting and Human Resources,
  - Reflects the breaking of complex tasks into smaller manageable tasks that could be assigned to a group of people who could then be held responsible.

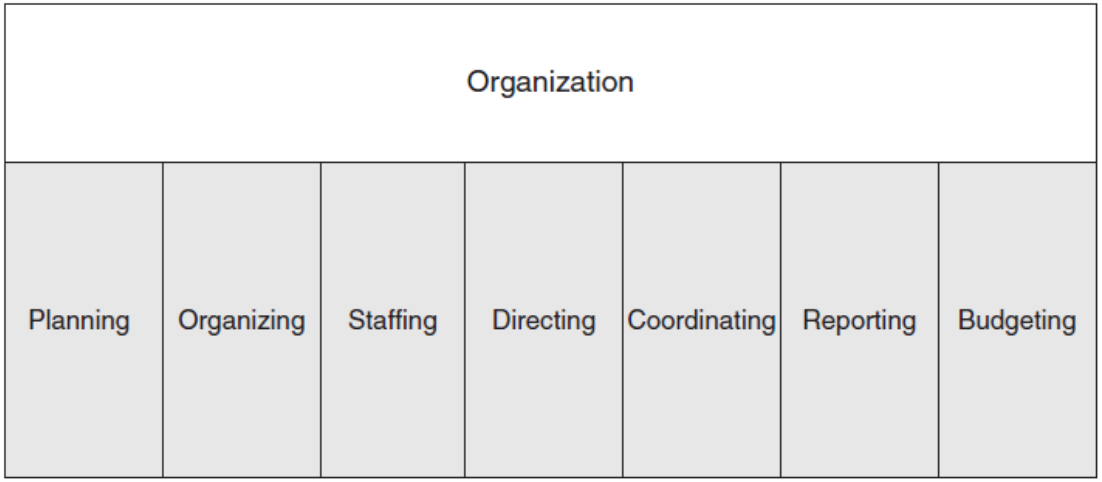


Figure 2-1 Functional Model of Organization (POSDCORB)

Vertical Silos

Vertical Silos

- Organizations divided roles in hierarchical layers from strategic planning to management control and operation control.

- CEOs and Presidents plan long-term strategy, midlevel management focuses on tactical issues and on the execution of organizational policy whereas the lower-level management task is to focus on the day-to-day operations of the company.

Vertical Silos

Vertical Silos

- As organizations get big and complex they tend to break functions into smaller units and assign staff the responsibility for these activities allowing them to manage complexity as well as specialize in activities that enhance productivity and efficiency.

Business Process and Silos

- The problem of functional silos gave birth to business process re-engineering (BPR).

- The cross-functional business process can involve people and resources from various functional departments working together, sharing information at any level of the organization.

- The cross-functional organizational structure breaks the functional silos by opening up the informational flows from one department to another.

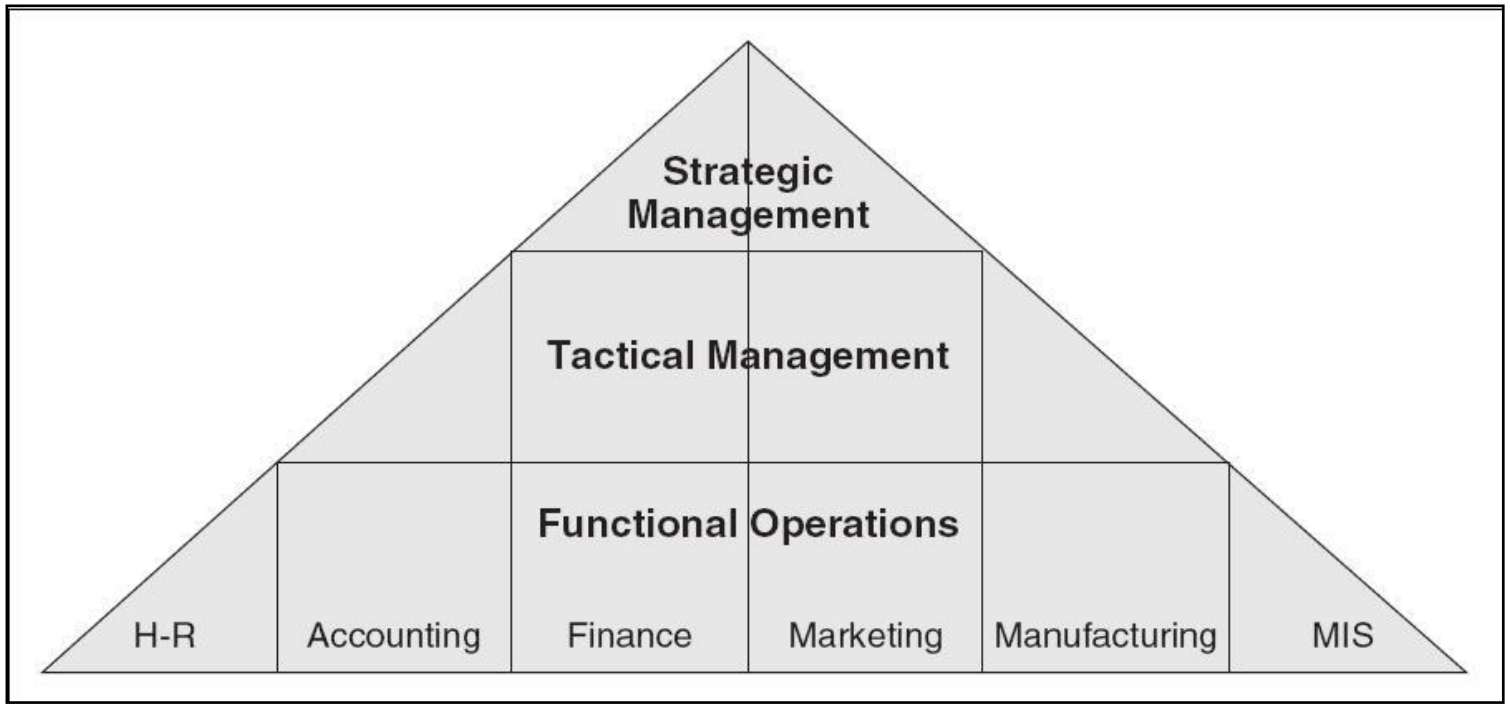


Figure 2-3 Matrix Structure of Organization

Evolution of IS in Organization

- The functions of an organization (e.g., sales, manufacturing, and HR):
  - Provide a structure by which an organization functions smoothly.

- A silo information system is inefficient, inaccurate, and expensive.
  - The system creates bottlenecks for everyone and information is not available in real-time.

IS Architecture

- Rapid advances in computer and networking technologies and changing organizational dynamics, drive the emergence of new information system models.

- Web-based systems today use a distributed architecture which allows the sharing of applications and data resources between the client and the server computers.

IS Architecture

- In this configuration, personal computers are connected via a network to a Web server that provides a window to an application and database server, which could be a mainframe or another type of computer.

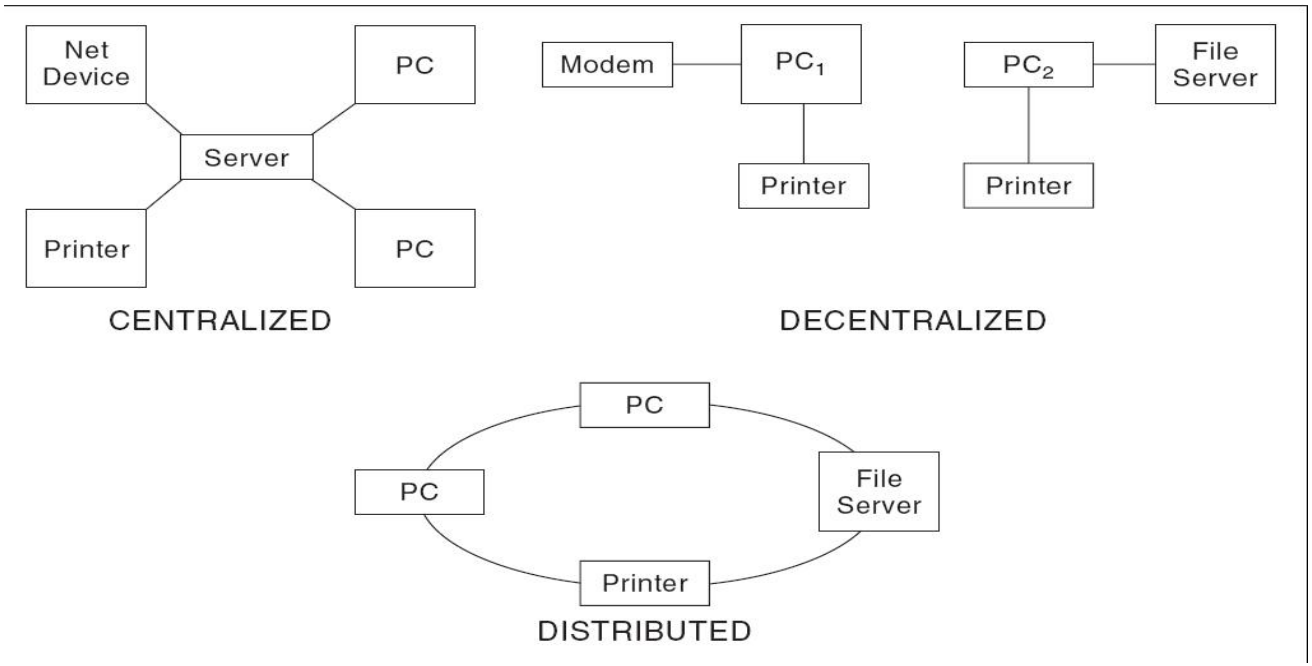


Figure 2-5 Information Systems Architectures

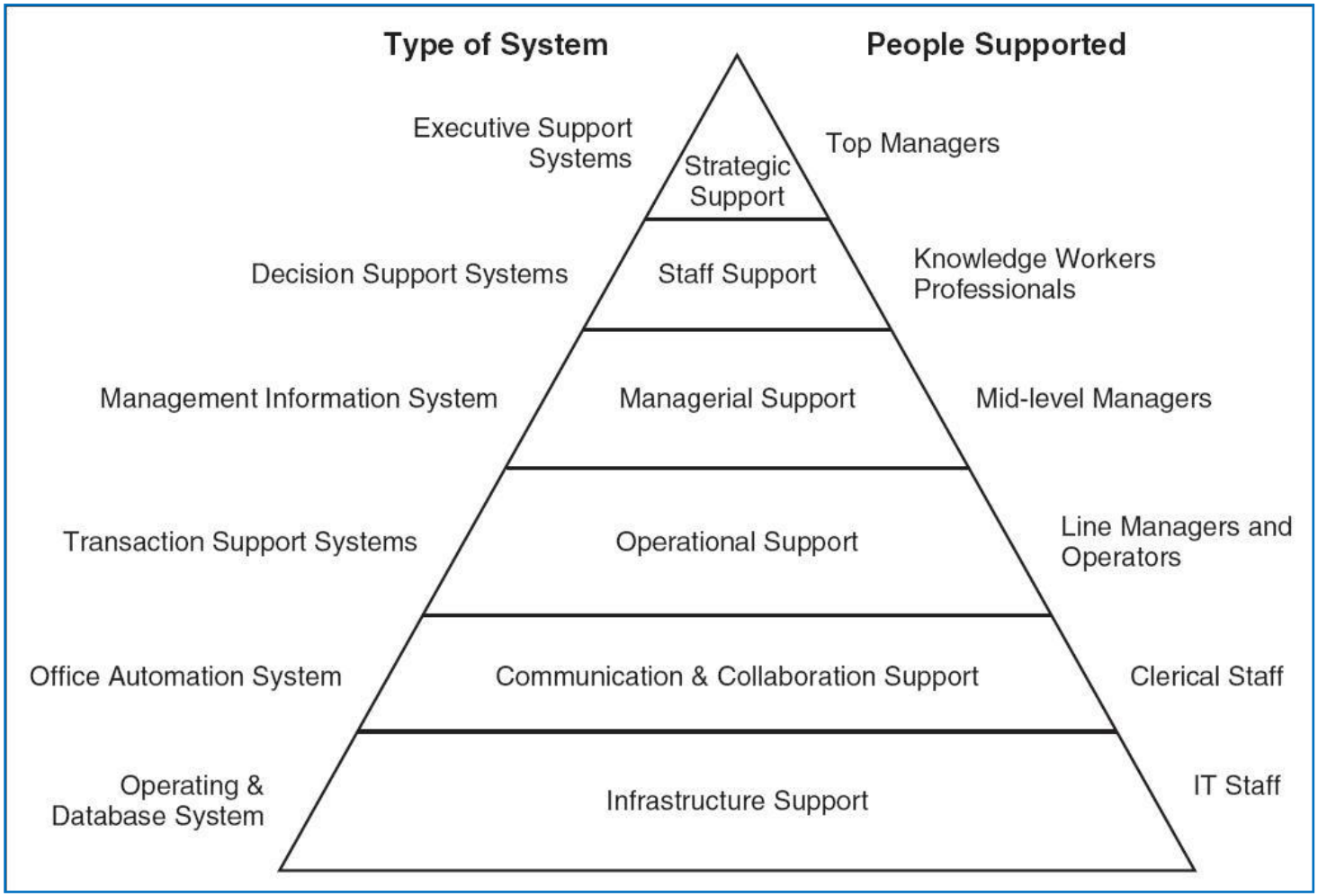
IS Functionalization

- IS also supports major business functions:
  - E.g.: manufacturing, marketing, accounting, finance, and HR.

- Each functional area has different information needs and report requirements.

- Each functional area in an organization also has multiple levels of management, each requiring different levels of analysis and details of information.

IS Functionalization



System Integration

1. **Logical**
   - Develop information systems that allow organizations to share data with all of its stakeholders based on need and authorization.
   - Management needs to change organizational structures, processes, and employee roles and responsibilities.

System Integration

2. **Physical**
   - Provide seamless connectivity between heterogeneous systems.
   - Business process reengineering involves changing the mindset of the employees in the organization, encouraging and enabling them to do their tasks in a new way.

Steps in Integrating System

Step 1	Resource categorization	Instituting IT support for an integrated systems environment is necessary to avoid support and maintenance problems with the integrated system.
Step 2	Compliance and standards	Develop a single sign-on policy because all employees and external partners will need access to an integrated system from anywhere, anytime.
Step 3	Legacy systems support	Develop a policy in support of older legacy applications.
Step 4	Middleware tools	Middleware tools are essential for integration in the short term if existing applications must be used by the organization.

Steps in Integrating System

Step 5	Authentication and authorization policies	Single sign-on policy for application and data access because all employees and external partners will need access to an integrated system from anywhere, anytime.
Step 6	Centralized IT services and support	The IT staff needs to be able to support all applications and platforms with a centralized IT help desk support.
Step 7	Back-up, recovery, and security	A good back-up and recovery system is essential if there is a system failure or a major disaster.
Step 8	Hardware and software standardization	Develop organization standards and policy on acquisition of new hardware and software which is aligned with organization IT strategy.

Benefits and Limitation of System Integration

Benefits	Limitations
Increased Revenue and Growth	High Initial Set-up Costs
Leveling the Competitive Environment	Power and Interdepartmental Conflicts (due to the sharing of information)
Enhanced Information Visibility	Long-term and Intangible ROI (Usually several years)
Increased Standardization	Creativity Limitations (Restricts Creativity and Independence)

ERP and System Integration

- ERP systems are:
  1. Integrated, multi-module application software packages designed to serve and support several business functions across an organization.
  2. Commercial software packages that facilitate collection and integration of information related to various areas of an organization.
  3. Enable the organization to standardize and improve its business processes to implement best practices for its industry.

ERP's Role in Logical Integration

- ERP systems require organizations to focus on business process rather than on functions.

- ERP systems come with built-in processes for a wide variety of common business functions.

ERP's Role in Logical Integration

- An ERP system implements best practices via specific built-in steps for processing a customer order in terms of:
  1. Order entry.
  2. Routing through departments.
  3. Communication of output to various parties.

ERP's Role in Physical Integration

- Before installing the ERP system, an organization may have to upgrade or install middleware or get rid of their legacy system's hardware and software.

- Integration is also required at the Data level, Client level, and at the Application level.

ERP's Role in Physical Integration

- A good ERP implementation improves operational efficiency with better business processes that focuses on organizational goals rather than on individual departmental goals.

- Improved efficiency with a paperless flow and electronic data interchange (EDI) or business-to-business (B2B) commerce environment with partners.

Implication for Management

- **Silos do not work.**
  - Most organizations lose out in the long-term when information is not shared in real time across the functional boundaries within the company.

- **System integration has many hidden benefits.**
  - Allows decision making to be cascaded to all departments
  - Allows employees at lower-levels to make better decisions while interacting with clients or partners.

Implication for Management

- **System integration has many challenges.**
  - Replacing old hardware and software
  - Working with IT consultants
  - Human challenges, such as impact on IT staff, department heads losing control of data, and rumors of layoffs

- **Systems integration raises many new ethical issues.**
  - Possibility of some employees exploiting information for personal advantage and illegal access of information.

Implication for Management

- Remedies can consist of:
  - Develop policies on ethical usage of information.
  - Install proper security software and hardware (like firewalls).
  - Allocate resources for training and education on accessing information.