

**IS 335: Information Technology in Business**  
**Lecture Outline**  
**Computer Technology: Your Need to Know**

**Objectives**

- In this discussion, you will learn to:
  - Describe the activities of information systems professionals
  - Describe the technical knowledge of computer hardware and system software needed to develop and manage information systems
  - Identify additional sources of information for continuing education in computer hardware and system software

**Technology and Knowledge**

- Computers
  - Increasingly complex and powerful
  - Easier to use
- Why is technological knowledge important?

**Acquiring and Configuring Technological Devices**

- Requires more knowledge than using devices effectively
- Challenges of an IS professional
  - Computer acquisition
  - Upgrading
  - Configuration choices

**Information System Development**

- Systems development life cycle (SDLC)
  - Unified Process (UP)
- Iterations
  - Series of repeated steps
  - Produce testable models or working software
- Disciplines
  - Groups of related activities

**Business Modeling and Requirements Disciplines**

- Purpose
  - To understand the system environment and tasks the system must perform
- Technical knowledge required to:
  - Assess degree to which users' needs are being met
  - Estimate resources required to address unmet needs

**Design Discipline**

- Purpose
  - To determine structure of a specific information system that fulfills system requirements (information architecture)
- Technical knowledge required to:
  - Select hardware and network components
  - Evaluate compatibility
- Sets of design activities
  - Architectural design
    - Select and describe exact configuration
  - Detailed design
    - Narrower in scope
    - Constrained by information architecture

### Specific Systems Design Tasks

<i>Selection of...</i>	<i>Examples</i>
Computer hardware	Processing, storage, I/O, and network components
Network hardware	Transmission lines, routers, firewalls
Software	OS, database management system, network services, network protocols, security protocols and software
Application program development tools	Programming languages, component libraries, integrated development environments

### Implementation and Testing Disciplines

- Purpose of implementation
  - To build, acquire, and integrate application software components
- Purpose of testing
  - To verify correct functioning of infrastructure and application software components and ensure they satisfy system requirements
- Require specific knowledge of hardware, networks, and system software

### Deployment Discipline

- Purpose
  - To install and configure infrastructure and application software components and bring them into operation
- Technical knowledge required to:
  - Format storage devices
  - Set up system security
  - Install and configure network services
  - Establish accounting and auditing controls

### Systems Evaluation and Maintenance

- Accounts for much of long range system cost
- Technical knowledge required to:
  - Address maintenance changes
  - Classify a proposed change as major or minor
  - Modify an existing system

### Managing Computer Resources

- Requires attention to compatibility and future trends
- Technical knowledge required to ensure that:
  - Each new system operates correctly by itself and operates smoothly with other systems in the organization
  - Software/hardware acquisitions provide a good foundation for current and future systems

### Roles and Job Titles

- Classification of computer professionals
  - Software developers
    - Often called systems developers
  - Systems programmers
    - Also application developers

- Hardware personnel
- Systems managers
- Computer hardware and software knowledge requirements of each group

### Software (Systems) Developers

- Contribute to different parts of SDLC
  - Systems analyst: business modeling and requirements
  - Systems designer: design discipline, sometimes deployment
  - Programmer: builds and tests software
- Need in-depth hardware and system software knowledge

### Types of Applications

<i>Type</i>	<i>Role</i>	<i>Education needed</i>
<b>Business transactions/ information processing</b>	<b>Process business transactions or provide information to managers</b>	<b>College or technical degree in management or business with specialization in information processing</b>
<b>Scientific</b>	<b>Meet data processing and numerical modeling needs</b>	<b>Degree in mathematics, computer science or a branch of engineering</b>
<b>Technical</b>	<b>Control or directly interact with hardware devices</b>	<b>Degree in mathematics, computer science or a branch of engineering</b>

### Systems Programmers

- Develop system software (operating systems, compilers, database management systems, network security monitors)
- Perform hardware troubleshooting and software installation and configuration
- Have degrees in computer science or computer engineering
- Work outside “tech” firms only in large orgs that maintain large systems, server farms, etc.
- Need in-depth knowledge of system software, computer hardware, and networks
  - System software often directly controls computer hardware or interacts with networks

### Hardware Personnel

- Design, install, and maintain hardware
- Education
  - Technical degree and/or vendor-specific training (lower level)
  - Degree in computer science or computer engineering (higher level)
- Require extensive knowledge of computer hardware (processing, data storage, input/output, and networking devices)

### Systems Managers

- Common job titles
  - Computer operations manager
  - Network administrator
  - Database administrator
  - Chief information officer

**Computer operations manager**

- Oversees operation of a large information processing facility (scheduling, staffing, security, system backups, maintenance, upgrades)
- Knowledge requirements
  - Broad base of technical knowledge to understand organization's information systems and infrastructure
  - Capability of understanding advice of technical staff

**Network administrator roles**

- May be responsible for network infrastructure
  - Requires technical expertise in computer hardware, telecommunications, and system software
  - Emphasis on network and data communication technology
- May be responsible for local area network
  - Provides access to many resources
  - One of the most demanding positions

**Network administrator responsible for LAN**

- Operates and maintains network
- Installs and maintains end-user software
- Installs and configures hardware
- Trains users
- Assists management in selecting and acquiring software and hardware

**Database administrator**

- Responsible for management of large collections of data
- Requires technical expertise and ability to help the organization exploit its data resources

**Responsibilities of a Chief Information Officer**

- Organization's computers, networks, software, and data
- Strategic planning
- Effective use of information/computing technology
- Broad base of technical knowledge to interact effectively with all technical specialists
- Vision of how technology is changing and how best to respond to changes to support organizational objectives

**Computer Technology Information Sources**

- Periodical literature (most important)
- Web sites
  - Technology-oriented
  - Vendor and Manufacturer
- Training courses offered by hardware and software vendors

**Periodical Literature**

- Examples of available literature
  - –ACM Computing Surveys
  - –Computerworld
  - –Communications of the ACM
  - –Computer
  - –InformationWeek
- Web-based periodicals
  - Provide content from back issues, additional content, a search engine, and other links

**Technology-Oriented Web Sites**

- Provide a common interface to publication families
- Enable publisher to provide additional content and services
- Can generate revenue in several ways
- May have biased content (expect to pay for completely unbiased information)

**Vendor and Manufacturer**

**Web Sites**

- Primarily marketing and customer support tools
- Provide current detailed technical product information
- Often biased in favor of vendor's products

**Professional Societies**

- AITP (Association for Information Technology Professionals)
- ACM (Association for Computing Machinery)
- IEEE Computer Society (Institute for Electrical and Electronics Engineers Computer Society)

**Summary**

- Technical knowledge of computers
  - Required to develop information systems
  - Required to manage an organization's information systems and infrastructure
- (compatibility, future trends)
  - Must be constantly updated
- Self-study and training
- Information available on Web