ISD100-Introduction to Systems & Informatics

Software and Mobile Applications

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Outline

- Software.
- Software Types.
- Software Classifications.
- System Software.
- Operating Systems.
- Utility Programs.
- Middleware.
- Application Software.

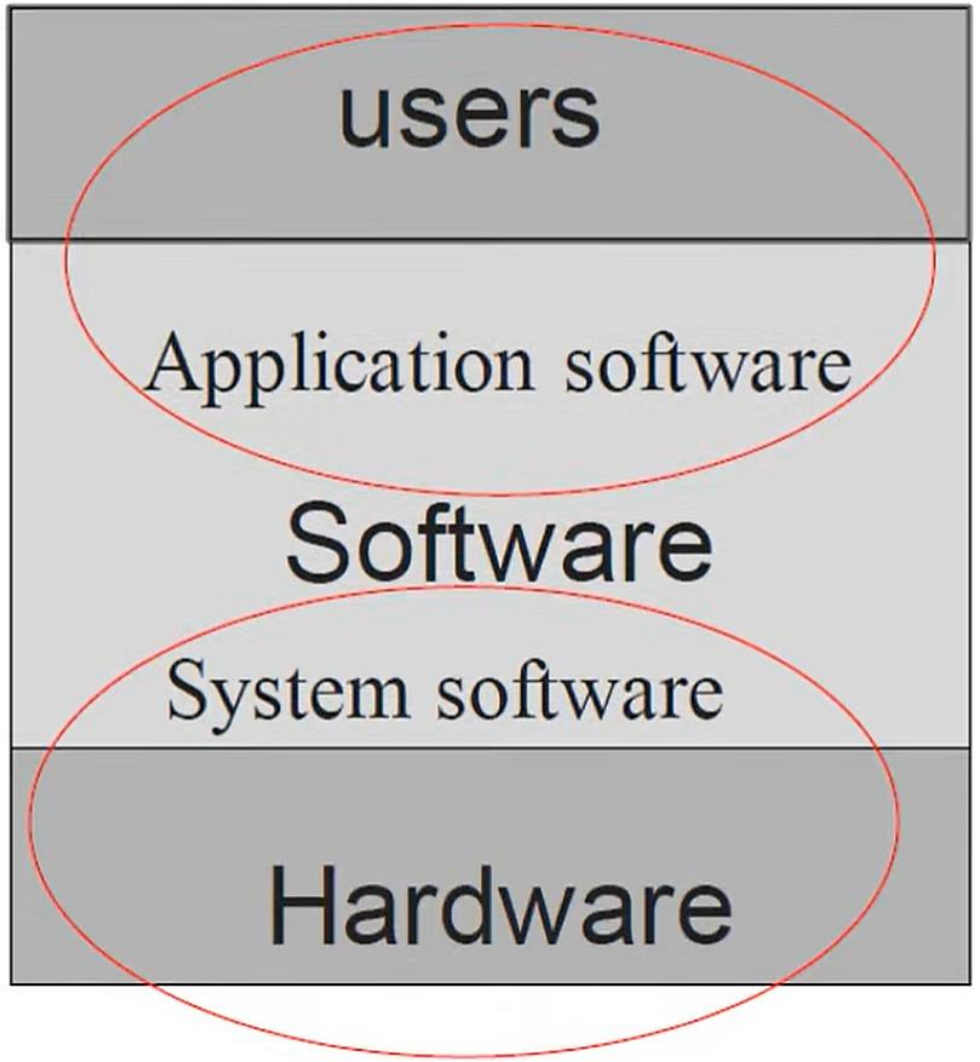
Why Learn About Software

- **Software:**
  - Indispensable for any computer system and the people using it.
- **Software types:**
  1. System software:
     - Input data from a keyboard, make calculations, print results, etc.
  2. Applications software:
     - Key for helping you achieve your career goals and enrich your life.
     - Stock trading, scientific, accounting, tax, gaming, etc.

Software

- Computer programs:
  - Sequences of instructions for the computer.
- Documentation:
  - Describes program functions.
- Software types:
  1. Systems software (programs control H/W)
     - Operating systems
     - Utility programs
     - Middleware
  2. Applications software (programs helps users need)
- Platform: System software combined with H/W.

Software


users
Application software
Software
System software
Hardware

Software Classifications

- Useful way to classify the potential use of IS by the scope of problems and solutions.
- The sphere of influence are: Personal, workgroup and enterprise.

1. **Personal:** Serve the needs of an individual user.
   - Software: Helps users to improve their personal effectiveness.
2. **Workgroup:** Serve the needs of workgroup.
   - Software: Helps workgroup attain its goals.
3. **Enterprise:** Serve the firm in its interaction with its environment.
   - Software: Helps enterprise to input and processes transaction data.

Software Classifications

Software	Personal	Workgroup	Enterprise
Systems software	Personal computer and workstation operating systems	Network operating systems	Midrange computer and mainframe operating systems
Application software	Word processing, spreadsheet, database, graphics	Electronic mail, group scheduling, shared work, collaboration	General ledger, order entry, payroll, human resources

Table 4.1

Software Supporting Individuals, Workgroups, and Enterprises

System Software

- Set of programs that coordinates the activities and functions of hardware and programs.
- Computer system platform:
  - Combination of a hardware configuration and systems software.
- System software:
  - Controls operations of computer hardware.
  - Supports application programs' problem-solving capabilities.
- Types of system software:
    - Operating systems
    - Utility programs
    - Middleware

Operating Systems

- Set of programs that controls computer hardware and acts as an **interface with application programs**.
- Kernel:
  - Ties all components of the OS together and regulates other programs.

Operating Systems

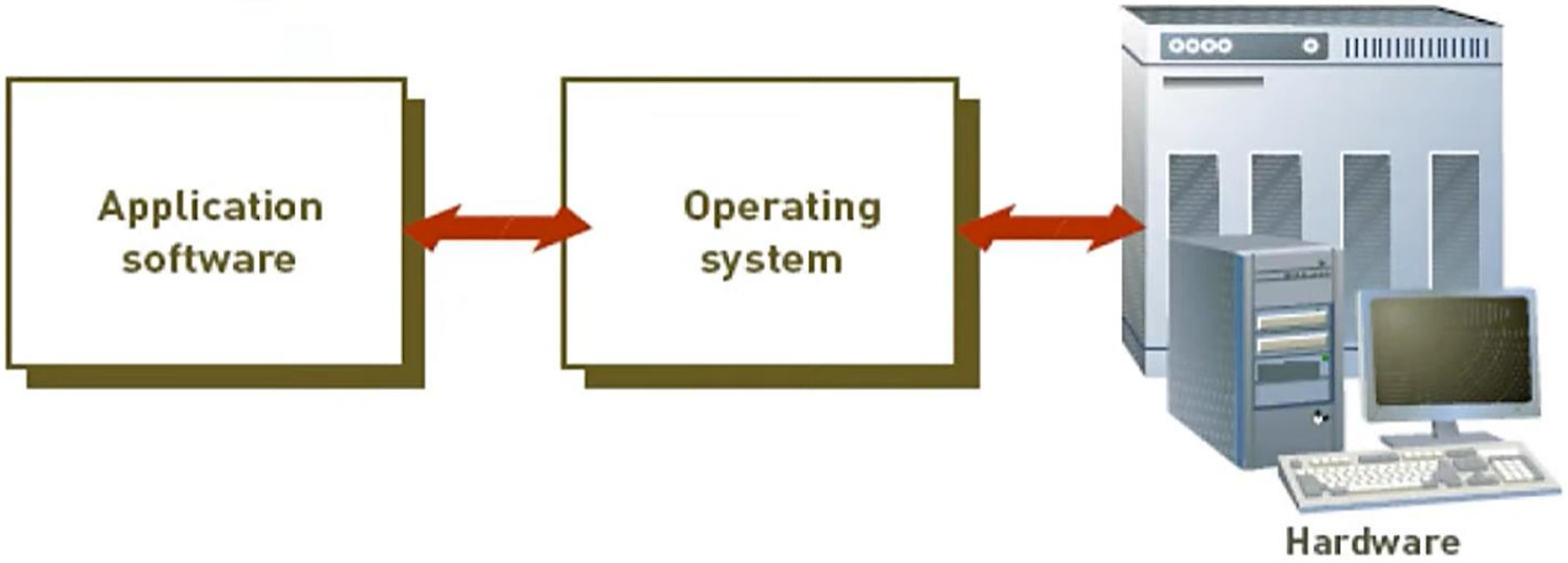


Figure 4.2

The Role of Operating Systems

The role of the operating system is to act as an interface or buffer between application software and hardware.

Operating Systems

- Activities performed by the operating system:
  - Perform common computer hardware functions.
  - Provide a user interface and input/output management.
  - Provide a degree of hardware independence.
  - Manage system memory.
  - Manage processing tasks.
  - Provide networking capability.
  - Control access to system resources.
  - Manage files.

Operating Systems

- Common hardware functions:
  - Get input from keyboard or some other input device.
  - Retrieve data from disks.
  - Store data on disks.
  - Display information on a monitor or printer.

Operating Systems

- User interface and input/output management:
  - User interface:
    - Allow individual to access and command the computer system.
  - Command-based user interface:
    - Requires that text commands be given to the computer to perform basic activities.
  - Graphical user interface (GUI):
    - Uses icons and menus displayed on screen to send commands to the computer system.

Operating Systems

- Hardware independence:
  - Application program interface (API):
    - Allows applications to make use of the operating system.
  - Memory management:
    - Allows computer to execute program instructions effectively and to speed processing.

Operating Systems

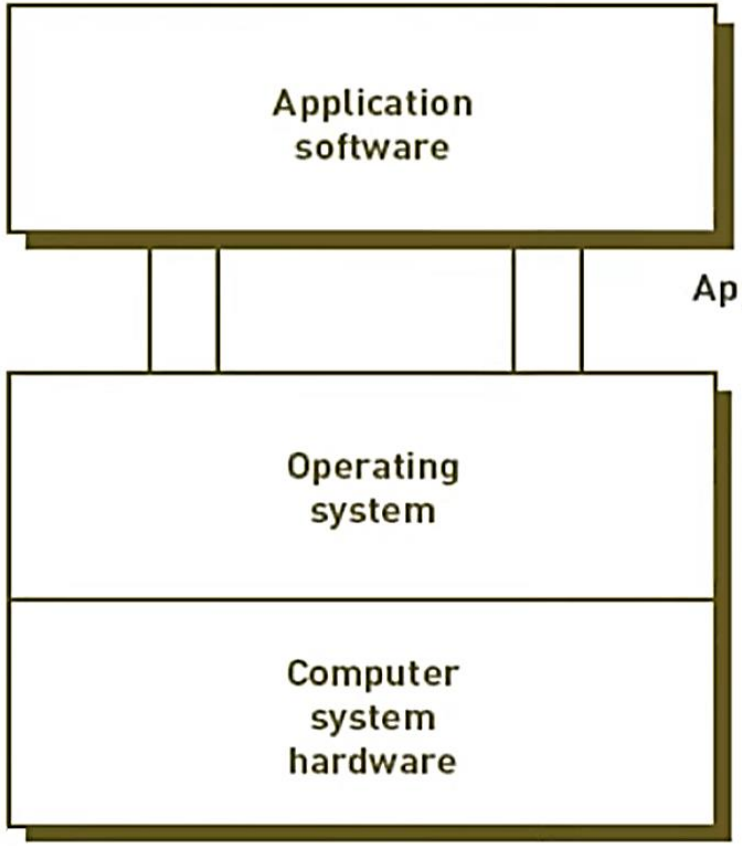


Figure 4.4

Application Program Interface Links Application Software to the Operating System

Operating Systems

- Processing tasks:
  - Multitasking:
    - More than one program can run at the same time.
  - Time sharing:
    - Allows more than one person to use a computer system at the same time.
  - Scalability:
    - Ability of the computer to handle an increasing number of concurrent users smoothly.

Operating Systems

- Networking capability:
  - Allows computers in a network to send and receive data and share computing resources.
- Access to system resources and security:
  - Protection against unauthorized access.
  - Login and passwords.
- File Management:
  - Ensures that files in secondary storage are available when needed and that they are protected from access by unauthorized users.

Classification of OS by Sphere of Influence

- Personal operating systems.
- Workgroup operating systems.
- Enterprise operating systems.
- Operating systems for small computers, embedded computers, and special-purpose devices.

Personal Operating Systems

- Microsoft PC operating systems.
- Apple computer operating systems.
- Linux.

Workgroup Operating Systems

- Windows server.
- Unix.
- NetWare.
- Red Hat Linux.
- Mac OS X server.

Enterprise Operating Systems

- z/OS:
  - IBM's first 64-bit enterprise OS.
- HP-UX and Linux:
  - HP-UX: robust UNIX-based OS from Hewlett-Packard.

Operating Systems for Small Computers, Embedded Computers, and Special-Purpose Devices.

- Palm OS.
- Windows embedded.
- Windows mobile.

Utility Programs

- Tasks: sort, keep track, enhance computer system performance, utilize unused computer power.
- Hardware utilities.
- Security utilities.
- File-compression utilities.
- Spam and pop-up blocker utilities.

Middleware

- Software that allows different systems to communicate and exchange data.
- Interface between client and servers computers on a network.

Application Software

- Helps users solve particular problems.
- In most cases, resides on the computer's hard disk.
- Can be stored on CDs, DVDs, and flash.

Application Software

- Application programs:
  - Interact with systems software.
  - Help you perform common tasks, such as:
    - Creating and formatting text documents.
    - Performing calculations.
    - Managing information.

Overview of Application Software

- Proprietary software:
  - One of a kind program for a specific application, usually developed and owned by a single company.
- Off-the-shelf software:
  - Existing software program that is purchased.
- Application service provider (ASP):
  - Company that can provide software, support, and computer hardware on which to run the software from the user's facilities over a network.

Personal Application Software

- Word processing
- Spreadsheet analysis
- Database applications
- Graphic programs
- Can be stored on CDs, DVDs, and flash.

Workgroup Application Software

- Support teamwork, whether people are in the same location or dispersed around the world.
- Groupware:
  - Software that helps groups of people work together more efficiently and effectively.

Enterprise Application Software

- Software that benefits an entire organization.
- Enterprise resource planning (ERP) software:
  - Set of integrated programs that manage a company's vital business operations for an entire multisite, global organization.

Copyrights and Licenses

- Most software products are protected by law using copyright or licensing provisions.
  - In some cases, you are given unlimited use of software on one or two computers.
  - In other cases, you pay for your usage – if you use the software more, you pay more.
- Some software now requires that you register or activate it before it can be fully used.

Open Source Software

- Software freely available to anyone in a form that can be easily modified.
- More reliable and secure than commercial software.
- Can contain hidden costs, particularly for user support or solving problems with the software.

Open Source Software

Software Type	Example
Operating system	Linux
Application software	Open Office
Database software	MySQL
Internet browser	Firefox
Photo editing	Gimp
Project management	OpenProj
Personal accounting	Grisbi
E-mail	Thunderbird

Software Upgrades

- Software companies revise their programs and shell new versions periodically.
- Revised software may or may not offer any major additional capabilities.
- Revised software can contain bugs or errors.
- Software upgrades usually cost much less than the original purchase price.