System Software and Application Software

- **System software**: The operating system and utility programs that control a computer system and allow you to use your computer
    - Enables the boot process, launches applications, transfers files, controls hardware configuration, manages hard drive, and protects from unauthorized use
- **Application software**: Programs that allow a user to perform specific tasks on a computer
    - Word processing, playing a game, preparing taxes, browsing the Web, and so forth

Introduction to Software

- Application Software for End Users
    - General Purpose Application Programs: perform common information processing jobs for end users
    - Productivity Package: increases productivity of user
    - Application-Specific Software: does a specific function
    - Custom Software: designed and created specifically to do a particular job for one company
    - Commercial Off-the-Shelf Software (COTS): developed to sell many copies (usually for profit), source code may not be modified by user
    - Open Source Software: anyone may modify the software, the documentation and source code are available to anyone
- Available to support any part of business
- Reengineer/Automate Business Processes
    - Customer Relationship management (CRM): is a term that refers to practices, strategies and technologies that companies use to manage and analyze customer interactions and data with the goal of improving business relationships with customers.

- Enterprise Resource Planning (ERP): is a process by which a company (often a manufacturer) manages and integrates the important parts of its business.
- Supply Chain Management (SCM): is the oversight of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer

🔸 Internal Organizational Activities
- Human Resource management (HRM)
- Accounting
- Finance

🔸 Decision Support tools
- Data Mining
- Enterprise Information Portals
- Knowledge Management Systems

The Operating System

🔸 Operating system: A collection of programs that manage and coordinate the activities taking place within a computer system
- Acts as an intermediary between the user and the computer

Functions of an Operating System

🔸 Managing resources and jobs
- Makes resources available to devices
- Monitors for problems
- Scheduling routines

🔸 File management
- Keeps track of files stored on computer
- Hierarchical format

🔸 Security
- Passwords, Biometric characteristics
- Firewalls

Processing Techniques for Increased Efficiency

- **Multitasking**: The ability of an operating system to have more than one program (task) open at one time
  - CPU rotates between tasks
  - Switching is done quickly
  - Appears as though all programs executing at the same time
- **Multiprocessing and parallel processing**: Multiple processors (or multiple cores) are used in one computer system to perform work more efficiently
- **Simultaneous processing**: Performs tasks at the same time
- Multiprocessing: Each CPU (or core) typically works on a different job
  - Used with personal computers with multi-core processors
- **Parallel processing**: CPUs or cores typically works together to complete one job more quickly
  - Used with servers and mainframes

Differences Among Operating Systems

- Personal vs. server operating system
  - Personal operating system: designed to be installed on a single computer
  - Server operating system: designed to be installed on a network server
    - Client computers still use a personal operating system
    - Server operating system controls access to network resources
  - Many operating systems come in both versions
- Mobile and embedded operating systems also exist

Operating Systems for Personal Computers and Servers

- **DOS**: Disk Operating System
  - PC-DOS: Created originally for IBM microcomputers
  - MS-DOS: used with IBM-compatible computers
  - DOS traditionally used a command-line interface

- Can enter DOS commands in Windows

Windows

- **Windows**: The predominate personal operating system developed by Microsoft Corporation
  - Windows 1.0 through Windows 3.x: Operating environments for DOS
  - Windows 95 and Windows 98: Used a similar GUI to the one used with Windows 3.x
  - Windows NT (New Technology): first 32-bit version of Windows designed for high-end workstations and servers
  - Windows Me (Millennium Edition): designed for home computers, improved home networking and a shared Internet connection
  - Windows 2000: replaced Windows NT; was geared towards high-end business workstations and servers, support for wireless devices
  - Windows XP: Replaced both Windows 2000 and Windows Me
    - Improved photo, video, and music editing and sharing
    - Improved networking capabilities
    - Support for handwriting and voice input
  - Windows Vista: Replaced Windows XP
  - Windows 7: Newest version of Windows released Oct. 2009
    - 32-bit and 64-bit versions in four editions
    - Home Premium (primary version for home users)
    - Professional (primary version for businesses)
    - Starts up and responds faster than Vista
    - Will run well on netbooks, unlike Vista
    - Improved home networking (Home Group, etc.)
  - Windows Server: Server version of Windows
    - Windows Server 2008: Most recent version
    - Includes a variety of services
      - Web platform, Support for virtualization, New security tools
  - Windows Home Server: based on Windows Server

- o Provides services for a home network
- o Can back up all devices on the network automatically

Mac OS

➕ <mark>Mac OS</mark>: Proprietary operating system for computers made by Apple Corporation
- Based on the UNIX operating system; originally set the standard for graphical user interfaces
- Mac OS X Snow Leopard: Most recent personal version
- Includes: Safari Web browser and More responsive than previous versions

UNIX

➕ <mark>UNIX</mark>: Operating system developed in the late 1960s for midrange servers
- Multiuser, multitasking operating system
- More expensive, requires a higher level of technical knowledge; tends to be harder to install, maintain, and upgrade
- "UNIX" initially referred to the original UNIX operating system, now refers to a group of similar operating systems based on UNIX
- Single UNIX Specification: A standardized UNIX environment

Linux

➕ <mark>Linux</mark>: Version (flavor) of UNIX available without charge over the Internet
- Increasingly being used with personal computers, servers, mainframes, and supercomputers
- Is open-source software: has been collaboratively modified by volunteer programmers all over the world
- Originally used a command line interface, most recent versions use a GUI
- Strong support from mainstream companies, such as Sun, IBM, HP, and Novell

- Much less expensive than Windows or Mac OS

Operating Systems for Mobile Phones and Other Devices

- **Windows Mobile**: Designed for mobile phones
  - Look and feel of desktop versions
  - Current version 6.1, next version to be called Microsoft Phone.
- **Android**: Linux based OS developed by Open Handset Alliance (including Google)
- **iPhone OS**: Designed for Apple Mobile phones and mobile devices.
- **BlackBerry Operating System**: Designed for BlackBerry devices

Operating Systems for Larger Computers

- Larger computers sometimes use operating systems designed solely for that type of system
- IBM's z/OS and i/5OS operating systems are designed for their servers and mainframes
- Windows, UNIX, and Linux are also used with both mainframes and supercomputers
- Often a group of Linux computers are linked together to form what is referred to as a Linux supercomputing cluster

Utility Programs

- **Utility program**: Software that performs a specific task, usually related to managing or maintaining the computer system
- Many utilities are built into operating systems (for finding files, viewing images, backing up files, etc.)
- Utilities are also available as stand-alone products and as suites
- **Search tools**: Designed to search for files on the user's hard drive
- **Diagnostic programs**: Evaluate your system and make recommendations for fixing any errors found

- **Disk management programs**: Diagnose and repair problems related to your hard drive

- **Clean up utilities**: Delete temporary files

- **Uninstall utilities**: Remove programs from your hard drive without leaving bits and pieces behind and properly uninstall programs, not just delete them

- **File compression programs**: Reduce the size of files so they take up less storage space on a storage medium or can be transmitted faster over the Internet

  - Both zip, unzip files and WinZip (Windows users) and Stuffit (Mac users)

- **Backup and recovery utilities**: backup and restoration process will be easier
  - Backup: Duplicate copy of data or other computer content
  - Good backup procedures are critical for businesses
  - Individuals should back up important documents, e-mail, photos, home video, etc.
  - Store backup data on a CD or DVD, second hard drive, flash memory drive, or upload to the Internet
  - Back up your entire computer once all programs have been installed, so your system can be restored to that configuration.

- **Security programs**: Protect computers and users
  - Antivirus programs, Antispyware programs, Firewalls, many are included in Windows and other operating systems

File Management Programs

- **File management programs**: Enable the user to perform file management tasks, such as: Looking at the contents of a storage medium, Copying, moving, and renaming files and folders, deleting files and folders, File management program in Windows is Windows Explorer

The Future of Operating Systems

1. Will continue to become more user-friendly

2. Will eventually be driven primarily by a voice interface
3. Likely to continue to become more stable and self-healing
4. Will likely continue to include improved security features and to support multiple processors and other technological improvements