KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
CHEMICAL ENGINEERING DEPARTMENT
CHE 158: INTRODUCTION TO INFORMATION TECHNOLOGY
INSTRUCTOR: Dr. (Mrs.) Mizpah A. D. Rockson

LECTURE 1

Learning Objectives

At the end of the lecture the student is expected to understand the following:

- Explain the parts of an information system: people, procedure, software hardware, data and the internet.
- Distinguish between system software and application software.
- Differentiate between the three kinds of system software programs.
- Define and compare general-purpose, specialized and mobile applications.
- Identify the four types of computers and the four types of personal computers.
- Describe the different types of computer hardware, including system unit, input, output, storage, and communication devices.
- Define data and describe document, worksheet, database, and presentation files.
- Explain computer connectivity, the wireless revolution, the internet, and cloud computing.

1.1 INTRODUCTION

20 years ago, most people had little to do with computers directly. The work with computers was handled by specialists like programmers, data entry clerks, and computer operators.

The advancement of microcomputer changed everything. Today, it is easy for nearly everybody to use a computer.

- Microcomputers are common tools in all areas of life. We write, draw, calculate, communicate, etc on it.
- New forms of learning have been developed by the use of microcomputers (e.g. distance learning).
- New ways of communication are available: electronic mail, electronic commerce, Internet to meet and share ideas and product.

Many interesting and practical uses have recently surfaced to make our personal lives richer and more entertaining. These applications range from recording digital video clips to creating personalized Web sites. People who use microcomputers are called “end users” and they use

prewritten programs (videogames, word processing and spreadsheet programs) rather than them writing the programs themselves. Competent end users need to know the parts of an information system; they need to understand connectivity, the wireless revolution, the Internet, and the Web and to recognize the role of information technology in their professional and personal lives.

In the 21st century, computer literacy will become prerequisite in whatever career a student chooses. The aim of this course is to provide students with the basic understanding of the concepts necessary for success in the Information age.

1.2 Information system

An information system has 5 parts: people, procedures, software, hardware, and data.

(1) **People:** It is easy to overlook people as one of the five parts of a microcomputer system. Yet this is what microcomputers are all about—making **people, end users** like you, more productive.

(2) **Procedures:** Procedures are rules for people to follow when using software, hardware, and data. These procedures are documented in manuals. Software and hardware manufactures provide manuals with their products.

(3) **Software:** Software is another name for a program or programs. A program is the step-by-step instructions that tell the computer how to do its work. The purpose of software is to convert data (unprocessed facts) into information (processed facts).

(4) **Hardware:** The hardware consists of the equipment (keyboard, mouse, monitor, system unit, and other devices). Hardware is controlled by software. It actually processes the data to create information.

(5) **Data:** Data consists of the raw, unprocessed facts, including text, numbers, images, and sounds. After data is processed through the computer, it is called information.

1.2.1 Software

There are 2 kinds of software: system software (the kind the computer uses) and application software (the kind we use).

a. System software

The user interacts with application software. System software enables the application software to interact with the computer hardware.

System software is not a single program. Rather, it is a collection of programs:

- **Operating system:** The most important system software is the operating system, which interacts between the application software and the computer. It coordinates computer resources, provides an interface between users and computer resources, and runs

(executes) applications. Microsoft's Windows 8 and Apple's Mac OS X are two of the best known operating systems for today's microcomputer users.

- **Utilities or service programs:** perform specific tasks related to managing computer resources. For example, the Windows utility called Disk Defragmenter locates and eliminates unnecessary file fragments and rearranges files and unused disk space to optimize computer operation.
- **Device drivers:** are specialized programs designed to allow particular input or output devices to communicate with the rest of the computer system.

b. Application software

Application software is used by the end user. It performs useful work on general-purpose tasks. Three types of application are *general-purpose*, *specialized*, and *mobile* apps.

✓ **General-purpose applications** are widely used in nearly all career areas. They are the kinds of programs you have to know to be considered computer competent. Popular ones include:

Word processor – used to prepare written documents

Spreadsheet – used to analyze and summarize numerical data

Database managers – used to organize and manage data and information

Presentation graphics – used to visually analyze and present data and information to other people

Browsers – used to navigate, explore, and find information on the Internet. Three most widely used explorers include Mozilla's Firefox, Microsoft's Internet Explorer, and Google's Chrome.

Integrated programs – combine several separate application programs within a single program. They provide limited capability at low cost.

✓ **Special-purpose applications** include thousands of other programs that are more specialized and widely used within certain career areas. Some of the best known are:

Multimedia – used to integrate video, music, voice, and graphics to create interactive presentations

Web publishers – used to create interactive multimedia Web pages

Graphic programs – used to create professional publications: draw, edit, and modify images

Virtual reality – used to create realistic 3-dimensional virtual or simulated environment

Artificial intelligence – used to simulate human thought processes and actions

Project agers – used to plan projects, schedule people, and control man-resources

- ✓ **Mobile apps** are small programs designed for mobile devices such as smartphones, tablet computers, palm top devices, etc. The most popular apps are for text-messaging, Internet browsing, and connecting to social networks.

1.2.2 Hardware

Computers are electronic devices that can follow instructions to accept input, process that input, and produce information.

There are 4 types of computers:

(1) **Supercomputers** are the most powerful type of computers. They are typically one-of-a-kind custom designs, special, high-capacity computers used by very large organizations. For example, NASA use supercomputers to track and control space exploration; simulations; worldwide weather forecasting; ……

(2) **Mainframe computers** occupy specially wired air-conditioned rooms. Although not nearly as powerful as supercomputers, mainframe computers are capable of great processing speeds and data storage. They are used by large organizations like banks, insurance companies, universities, government agencies, ….

(3) **Minicomputers** are desk-sized machines. They fall between microcomputers and mainframe in their processing speeds and data-storing capacities. Medium-sized companies or departments of large companies use them for specific purposes. For example, they might be used to do research or to monitor a particular manufacturing process.

(4) **Microcomputers** are the least powerful, yet the most widely used and fastest growing type of computers. There are 4 types of microcomputers:

- ✓ **Desktop computers** or **Personal Computers** (**PC**) are small enough to fit on the desk yet are too big to carry around.
- ✓ **Notebook/laptop computers** are portable, lightweight and can fit into a briefcase.
- ✓ **Tablet PC** is a type of notebook (smaller, lighter, and less powerful than notebook) computer that accepts your handwriting. This input is digitized and converted to standard text that can be further processed by a word processor. Thus, it has a virtual keyboard that appears on the screen and it is touch-sensitive. The best known tablet is ***Apple's iPad***.

- ✓ **Handheld computers** or **palm computers** are the smallest and are designed to fit into the palm of one hand. ***Personal digital assistants*** (**PDA**) and ***Smartphones*** are the most widely used handheld computers.

Figure 1.1 Microcomputers

Microcomputer hardware falls into 4 categories:

(1) **System units**: The system unit is a container that houses most of the electronic components that make up the computer system. It has 2 important components:

- **Microprocessor** controls and manipulates data to produce information.
- **Memory** or **primary storage** or **random access memory (RAM):** It is a holding area for data, instructions, and information. Memory is also referred to as **temporary storage** because its contents will be lost if the electrical power to the computer is disrupted. It is located in the system unit on a tiny memory chip.

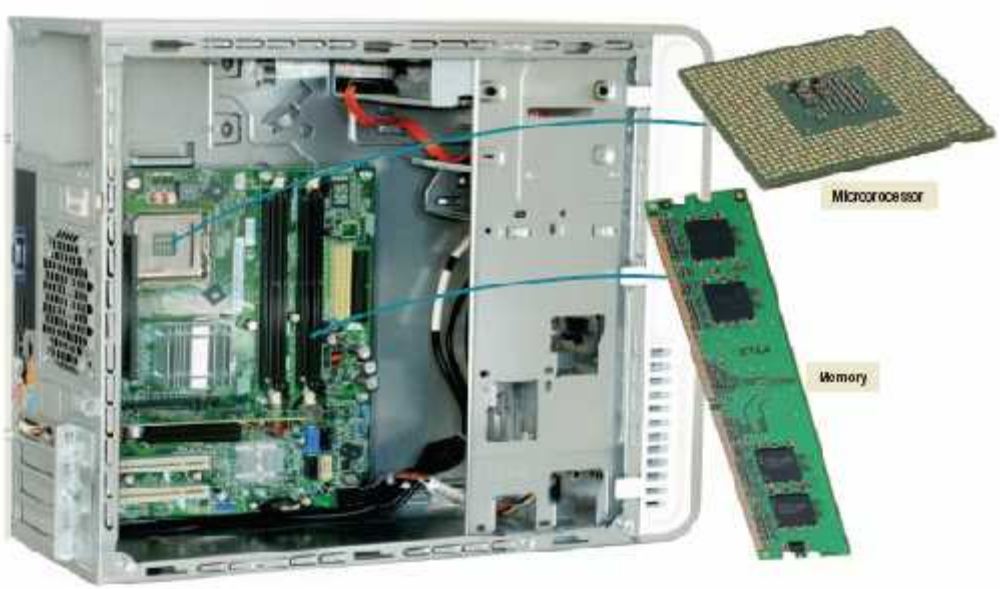

Figure 1.2: System unit

(2) **Input/output devices:** Input devices translate data and programs that humans can understand into a form that the computer can process. The most common input devices are the **keyboard** and **mouse**. Output devices translate the processed information from the CPU into a form that humans can understand. The most common output devices are **monitors** and **printers**.

(3) **Secondary storage devices** hold data and programs permanently even after the electrical power to the computer is turned off. They are located outside of the CPU, and are built into the system unit cabinet. The most important kinds of secondary storage media are as follows:

- **Floppy disks** or **diskettes** were widely used to store and transport data from one computer to another. They are called floppy because data is stored on a very thin flexible, or floppy, plastic disk.
- **Hard disk** contains 1 or more metallic disk (platters) encased within a disk drive. It is used to store programs and very large data files. It has a much greater capacity and is able to access information much faster than floppy disks.
- **Solid-state storage** does not have any moving parts, is more reliable, and requires less power. It saves data and information electronically similar to RAM except that it is not volatile. The types of **solid-state drives (SSDs)** that are used much the same way as an internal hard disk, **flash memory cards** that are widely used in portable devices, and **USB drives** that are a widely used compact storage medium for transporting data and information between computers and a variety of specialty devices.
- **Optical discs** use laser technology and have the greatest capacity. Three types of optical discs are **compact discs (CDs), digital versatile** (or **video**) **discs (DVDs) ,** and **blu-ray discs.**

(4) **Communication devices** send and receive data and programs from one computer or secondary storage device to another. The most widely used communication device is a **modem**, which converts electronic signals from the computer into electronic signals that can travel over a telephone line and onto the Internet.

1.2.3 Data

Data are unprocessed facts about something. When stored electronically in files, data can be used directly as input for the information system.

4 common types of files are:

- **Document files**, created by word processor to save documents such as memos, letters, assignments, project report, etc
- **Worksheet files,** created by electronic spreadsheets to analyze things like budget, predict salaries, etc
- **Database files,** created by database management programs to contain highly structured and organized data. For example, an employee database file might contain all the worker's names, social security numbers, job titles, and other related pieces of information.
- **Presentation files,** created by presentation graphics programs to save presentation materials. For example, a file might contain audience handouts, speaker notes, and electronic slides.

1.3 Connectivity

Connectivity is the capability of your microcomputer to share information with other computers. Data and information can be sent over telephone lines or cables and through the air. Thus, your microcomputer can be connected to other computers. It can connect you to the Internet and many other computerized data banks and other sources of information.

Central to the concept of connectivity is the **computer network**. A network is a communication system connecting two or more computers. The largest network in the world is the **Internet**. It is a huge computer network available to nearly everyone with a microcomputer and a means to connect to it. The **Web**, or **World Wide Web** or **WWW**, is an Internet service that provides a multimedia interface to the numerous resources available on the Internet.

The two most dramatic changes in connectivity in the past few years has been the widespread use of **mobile** or **wireless communication devices** and **cloud computing**.

Cloud computing uses the Internet and the Web to shift many computer activities from a user's computer to computers on the Internet.

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LECTURE 2: **THE INTERNET AND THE WEB**

Learning Objectives

At the end of the lecture the student is expected to understand the following:

1. Explain the origins of the Internet and the web.
2. Explain how to access the web using providers and browsers.
3. Compare different web utilities, including plug-ins, filters, file transfer utilities, and Internet security suites.
4. Compare different Internet communications, including e-mail, text messaging, instant messaging, social networking, blogs, microblogs, webcasts, podcasts, and wikis.
5. Describe search tools, including search engines and specialized search engines.
6. Evaluate the accuracy of information presented on the web.
7. Identify electronic commerce, including B2C, C2C, B2B, and security issues.
8. Describe cloud computing, including the three-way interaction of clients, Internet, and service providers.

Do you want to communicate with a friend in another town or in another country? Would you like to send a drawing, a photo, or just a letter? Are you looking for travel or entertainment information? Perhaps, you want to research an assignment. Where do you start? Try the Internet and the Web.

The Internet is often referred to as the Information Superhighway moving ideas and information through **cyberspace**. Competent end users need to be aware of the resources available on the Internet and the Web. Additionally, they need to know how to access these resources, to effectively communicate electronically, to efficiently locate information, to understand electronic commerce, and to use the Web utilities.

2.1 Beginnings

The Internet, or Net, was launched in 1969 when the United States funded a major research project on computer networking. A national computer network called **Advanced Research Project Agency Network** (**ARPANET**) was developed. It was used by government and military agencies to communicate and share computer resources with researchers working on national security projects. The Internet evolved from these military and research beginnings.

The **Web**, also known as **WWW** and the **World Wide Web**, was introduced in 1992 at the **Center for European Nuclear Research** (**CERN**) in Geneva, Switzerland. Prior to the Web, the Internet was all text – no graphics, animations, sound, or video. The Web provided a multimedia interface to resources available on the Internet. From these research beginnings, the Internet and the Web evolved into one of the most powerful tools of the 21st century.

It is easy to get the Internet and the Web confused, but they are not the same thing. The Internet is the actual physical network. It is made up of wires, cables, and satellites. Being connected to this network is described as being **online**. The Internet connects over 6 billion computers and resources throughout the world. The Web is a multimedia interface to the resources available on the Internet. Every day over a billion users from all around the world use the Internet and the Web.

2.2 Internet applications

The most common Internet applications are:

- **Communicating**: is by far the most popular Internet activity. You can exchange e-mail with your family and friends almost anywhere in the world. You can join and listen to discussions and debates on a wide variety of special-interest topics.
- **Shopping**: is one of the fastest-growing Internet applications. You can window shop, look for the latest fashions, search for bargains, and make purchases.
- **Researching**: for information has never been more convenient. You can access some of the world's largest libraries directly from your home computer. You can find the latest local, national, and international news.
- **Education or e-learning**: is another rapidly emerging Web application. You can take classes on almost any subject. There are courses just for fun and there are courses for high school, college, and graduate school credit. Some cost nothing to take and others cost a lot.
- **Entertainment**: You can find music, movies, magazines, and computer games. You will find live concerts, movie previews, book clubs, and interactive live games.

The first step to using the Internet and the Web is to get connected, or to gain access to the Internet.

2.3 Access

Providers give us access to the Internet. Browsers provide access to Web resources.

2.3.1 Providers

The most common way to access the Internet is through a **Commercial Internet service provider (CISP).** The providers are already connected to the Internet and provide a path or connection for individuals to access the Internet.

2 widely known Internet providers:

- **Universities/Institutions**: Most colleges, universities or institutions provide free access to the Internet through their local area networks (LAN).
- **Internet service providers**: offer access to the Internet for a fee. They include national and wireless service providers. National service providers provide access through standard telephone lines. Wireless service providers provide connections with wireless modems and a wide variety of wireless devices. They do not use telephones lines. In Ghana, almost all telecommunication companies are Internet providers.

2.3.2 Browser

Browsers are programs that provide access to Web resources. This software connects you to remote computers, opens and transfers files, displays text and images, and provides in one tool an uncomplicated interface to the Internet and Web documents. Browsers allow you to explore, or to **surf,** the Web by easily moving from one Web site to another. Four well known browsers are Mozilla Firefox, Apple Safari, Microsoft Internet Explorer, and Google Chrome.

- **Addresses:** For browsers to connect to resources, the **location** or **address** of the resources must be specified. These addresses are called **uniform resource locators (URLs).** All URLs have at least two basic parts. The first part presents the protocol used to connect to the resource. **Protocols** are rules for exchanging data between computers. The protocol ***http*** is used for Web traffic and is the most widely used Internet protocol. The second part presents the **domain name.** It indicates the specific address where the resource is located.

An example is shown below. Many URLs have additional parts specifying directory paths, file names, and pointers.) The last part of the domain name following the dot (.) is the **top-level domain (TLD).** It identifies the type of organization. For example, *.com* indicates a commercial site. The URL *http://www.mtv.com* connects your computer to a computer that provides information about MTV.

Domain	Organization type
.com	Commercial
.edu	Educational

.gov	Government
.org	Other organization
.mil	US Military
.net	Network

Table 2.1 Top-level domains

-Web pages: Once the browser has connected to the Web site, a document file is sent back to your computer. This document contains **Hypertext Markup Language (HTML)** commands. The browser interprets the HTML commands and displays the document as a Web page. The first page at a Web site is referred to as the **home page**. The home page presents information about the site along with references and **hyperlinks** or **links** that connect to other documents containing related information—text files, graphic images, audio, and video clips.

Figure 2.1 Web page

These documents may be located on a nearby computer system or on one halfway around the world. The computer that stores and shares these documents is called a **Web server**. The links typically appear on the Web page as underlined and colored text and/or images. When your mouse passes over a link, the mouse pointer changes to the shape of a small hand. To access the referenced material, all you do is click on the highlighted text or image. A connection is automatically made to the computer containing the material, and the referenced material appears on your display screen.

Web pages can also contain links to special programs, called **applets** that are typically written in **Java** programming language. These programs can be quickly downloaded and run by most browsers. Java applets are widely used to add interest and activity to a Web site by presenting animation, displaying graphics, providing interactive games and so on.

2.4 Communication

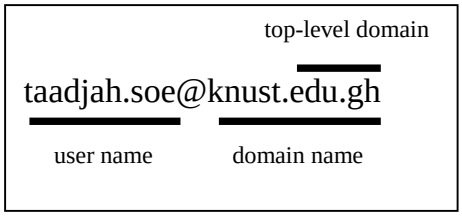
Communication is the most popular Internet activity and its impact cannot be overestimated. Some popular types of Internet communication are e-mail, instant messaging, social networking, blogs, and wikis.

2.4.1 E-mail

E-mail or **electronic mail** is the transmission of electronic messages over the Internet. All you need to send and receive e-mail is an e-mail account, access to the Internet, and an e-mail program. Two of the most widely used e-mail programs are **Microsoft's Outlook Express** and **Mozilla Thunderbird**.

A typical e-mail message has three basic elements: header, message, and signature.
(1) **Header** appears first and typically includes the following information:

- **Addresses**: Addresses of the persons sending, receiving, and, optionally, anyone else who is to receive copies. E-mail addresses have two basic parts. The first part is the user's name and the second part is the domain name, which includes the top-level domain.



  The domain name is a reference to a particular organization. The user name identifies a unique person or computer at the listed domain.
- **Subject**: A one-line description, used to present the topic of the message. Subject lines typically are displayed when a person checks his or her mailbox.
- **Attachments**: Many e-mail programs allow you to attach files such as documents, spreadsheet, and image files. If a message has an attachment, the file name typically appears on the attachment line.

(2) **Message**

(3) **Signature:** The **signature** provides additional information about the sender. This information may include the sender's name, address, and telephone number.

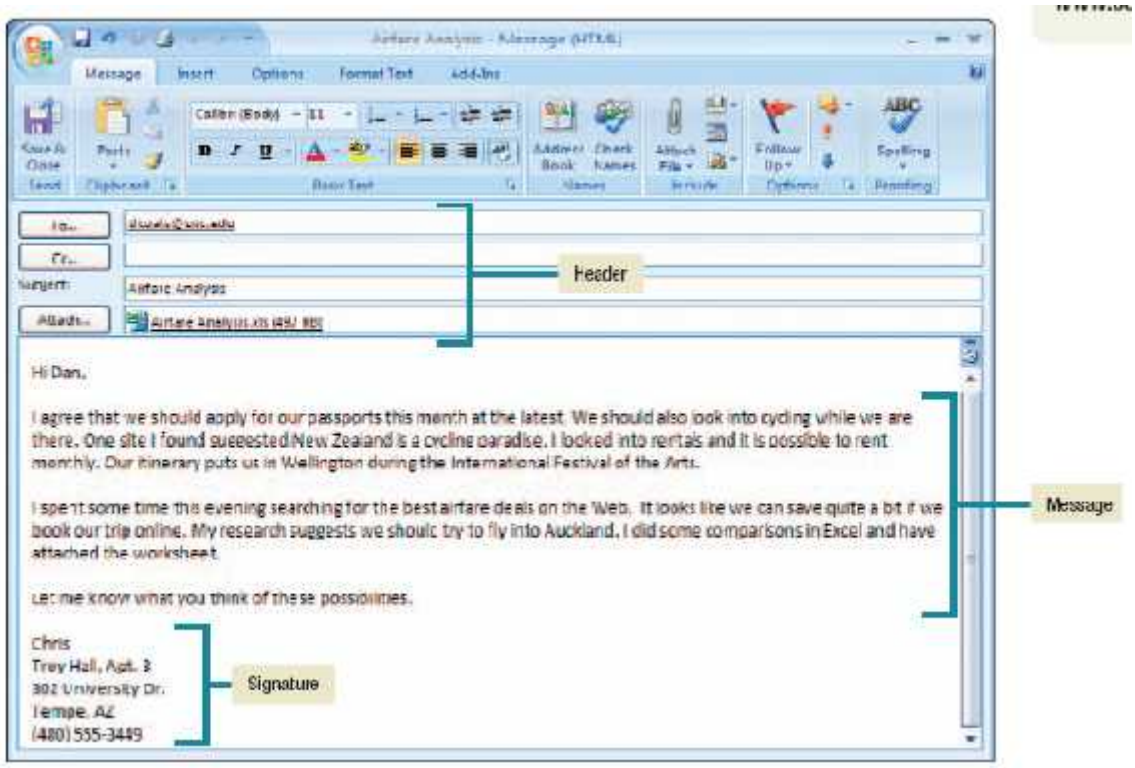


Figure 2.2: Basic elements of an email message

Users receive billions of unwanted and unsolicited e-mails every year. This unwelcome mail is called **spam**. Spam is not only a nuisance, but it can also be dangerous. **Computer viruses** or destructive programs are often attached to unsolicited e-mail.
The use of **spam blockers,** also known as **spam filters** are effective in dealing with computer viruses. These programs use a variety of different approaches to identify and eliminate spam.

Spam blocker	Site
SPAMfighter	www.spamfighter.com
SpamEater	www.spameater.com
Spam Buster	www.spambuster.com

Table 2.2 Spam blockers

2.4.2 Instant messaging

Instant messaging (IM) allows two or more people to contact each other via direct, live communication. To use instant messaging, you register with an instant messaging server and then specify a list of **friends.** Whenever you connect to the Internet, special software informs your messaging server that you are online. In response, the server will notify you if any of your friends are online. At the same time, it notifies your friends that you are online. You can then

send messages directly back and forth to one another. Most instant messaging programs also include video conferencing features, file sharing, and remote assistance.
The most widely used instant messaging services are AOL's Instant Messenger, Microsoft's MSN Messenger, and Yahoo Messenger.
One limitation, however, is that many instant messaging services do not support communication with other services.
Recently, however, some software companies have started providing **universal instant messenger** programs that overcome this limitation. Three widely used programs are **Digsby**, **Pidgin**, and **Qnext**.

2.4.3 Social Networking

One of the fastest-growing uses of the Internet is **social networking,** or connecting individuals to one another. While many social networking sites support a wide range of activities, there are three broad categories: reuniting, friend-of-a-friend, and common interest.

- **Reuniting:** are designed to connect people who have known one another but have lost touch; for example, an old high school friend that you have not seen for several years. You join a social network by connecting to a reuniting site and providing profile information such as your age, gender, name of high school, and so forth. This information is added to the reuniting site's member database. Members are able to search the database to locate individuals. Many of the sites will even notify you whenever a new individual joins that matches some parts of your profile (such as high school class). Two of the best-known reuniting sites are **Classmates Online** and **Facebook**.
- **Friend-of-a-friend:** are designed to bring together two people who do not know one another but share a common friend. The theory is that, if you share a common friend, then it is likely that you would become friends. Two well-known friend-of-a-friend sites are **Friendster** and **MySpace**.
- **Common interest sites:** bring together individuals that share common interests or hobbies. You select a networking site based on a particular interest. For example, if you wanted to share images, you might join **Flickr** or **YouTube**. If you are looking for business contacts, you might join **Linkedln**. If you wanted to locate or create a special interest group, you might join **Meetup**.

2.4.4 Blogs, Microblogs, and Wikis

Aside social networking sites, people can communicate across the Web using blogs and wikis.

- **Blogs**: Many individuals create personal Web sites, called **Web logs** or **blogs,** to keep in touch with friends and family. Blog postings are timestamped and arranged with the newest item first. Often, readers of these sites are allowed to comment. Some blogs are like online diaries with personal information; others focus on information about a hobby or theme, such as knitting, electronic devices, or good books. Although most are written by individual bloggers, there are also group blogs with multiple contributors. Some businesses and newspapers also have started blogging as a quick publishing method. Several sites provide tools to create blogs. Two of the most widely used are **Blogger** and **WordPress**.

- **Microblogs:** A **microblog** publishes short sentences that only take a few seconds to write, rather than long stories or posts like a traditional blog. Microblogs are designed to keep friends and other contacts up-to-date on your interests and activities. The most popular microblogging site is **Twitter.**
- **Wikis**: A **wiki** is a Web site specially designed to allow visitors to fill in missing information or correct inaccuracies. Wikis support collaborative writing in which there isn't a single expert author, but rather a community of interested people who build knowledge over time. Perhaps the most famous example is **Wikipedia**, an online encyclopedia, written and edited by anyone who wants to contribute, that has millions of entries in over 20 languages.
- **Webcast -** streaming technology for live broadcast of audio and video.
- **Podcast -** audio and video files that can be downloaded to your computer or media player

2.5 Search tools

With over a trillion pages and more being added daily, the Web is a massive collection of interrelated pages. With so much available information, locating the precise information you need can be difficult. A number of organizations called **search services** operate Web sites that can help you locate the information you need. They maintain huge databases relating to information provided on the Web and the Internet. The information stored at these databases includes addresses, content descriptions or classifications, and keywords appearing on Web pages and other Internet informational resources. Special programs called **spiders** continually look for new information and update the search services' databases. Additionally, search services provide special programs called **search engines** that you can use to locate specific information on the Web.

2.5.1 Search engines

Search engines are specialized programs that assist you in locating information on the Web and the Internet. To find information, you go to a search service's Web site and use its search engine. An example is Yahoo's search engine. This search engine, like most others, provides two different search approaches.

- **Keyword search**: In a keyword search**,** you enter a keyword or phrase reflecting the information you want. The search engine compares your entry against its database and returns a list of **hits,** or sites that contain the keywords. Each hit includes a hyperlink to the referenced Web page (or other resource) along with a brief discussion of the information contained at that location.
- **Directory search**: Most search engines also provide a directory or list of categories or topics such as Autos, Finance, and Games. In a **directory search,** you select a category or topic that fits the information that you want. Another list of subtopics related to the topic you selected appears. You select the subtopic that best relates to your topic and another subtopic list appears. You continue to narrow your search in this manner until a list of Web sites appears. This list corresponds to the hit list previously discussed.

Figure 2.3 Yahoo's search engine

Table 2.3: References, databases and subject directories among others

SITE	CONTENT
Britannica.com	Encyclopedia Britannica and Internet Guide
Encyclopedia.com	Features more than 100 trusted sources, including encyclopedia, dictionaries and thesauruses
Dictionary.net	Word and phrase definitions from a variety of dictionary resources
Refdesk.com	Links to facts, encyclopedias, dictionaries, news
Infomine (infomine.ucr.edu)	Extensive index of scholarly Internet resources
AllWords (allwords.com)	Find a word if you only part of it
whatis.com (whatis.techtarget.com)	Dictionary of Computer Terms
BUBL (bubl.ac.uk)	A catalogue of all academic subject areas
Google Directory	

(directoryresources.org)	The Web organized by topics into categories
Open Directory Project (dmoz.org)	The most comprehensive human edited directory of the Web
The Scout Archives	Search or browse subject-specific database. It contains over 26,000 critical annotations of carefully selected Internet sites and mailing lists
Intute (intute.ac.uk)	Directory of study and research resources
allacademic.com	Journals and other free academic content
Academic Info	Online degree programs and subject guide
SciCentral (scicentral.com)	Science sites
Wikipedia	Community written encyclopedia

2.5.2 Metasearch engines

Metasearch engines are programs that automatically submit your search request to several search engines simultaneously. The metasearch engine receives the results, eliminates duplicates, orders the hits, and then provides the edited list to you.
There are several metasearch engines available on the Web. Some of them are:

Metasearch Service	Site
MetaCrawler	www.metacrawler.com
Dogpile	www.dogpile.com
Search	www.search.com
Ixquick	www.ixquick.com
Clusty	www.clusty.com

Table 2.4: Metasearch sites

2.5.3 Specialized search engines

Specialized search engines focus on subject-specific Web sites. Specialized sites can potentially save you time by narrowing your search.

Topic	Site
Environment	www.eco-web.com
Fashion	www.infomat.com
History	www.historynet.com
Law	www.llrx.com
Medicine	www.medsite.com

Table 2.5: Some specialized search sites

2.6 Searching the Internet

Information is everywhere on the Internet, existing in large quantities and continuously being created and revised. This information exists in a large variety of kinds (facts, opinions, stories, interpretations, statistics, etc) and is created for many purposes (to inform, persuade, sell, present a viewpoint, create or change an attitude or belief, etc). For each of these various kinds and purposes, information exists on many levels of quality or reliability. It ranges from very good to very bad and includes every shade in between. Unlike most traditional information media (books, magazines, organizational documents), no one has to approve the content before it is made public. It is your job as a searcher, then, to evaluate what you locate.

Before you begin searching, you first need a little understanding about how information is stored and accessed on the Web. There are three categories of information on the Web.

- **The free, visible Web**: This category includes all the publicly mounted Web pages. These pages are indexed by search engines. To find information from this category, use a good search engine or directory.
- **The free, invisible Web**: This category includes the contents of sites that provide their articles or information free to users, but that content may be accessible only by going directly to the site. In other words, search engines cannot index it. Some magazines, newspapers, reference works, and other sites like Facebook, Twitter, etc are in this category. Many databases such as legal, medical, and financial are here, too. To find information from this category, you must go to the appropriate database.
- **Paid database over the Web**: This category includes commercial databases that libraries subscribe to, containing scholarly journals, newspapers, court cases and the like. Providers like Lexis-Nexis, UMI Proquest, Infotrac, JSTOR and others are in this group. To find information from this category, you must have access to the database (through password) and search on the database directly.

The invisible Web (Deep Web)

The deep Web refers to World Wide Web content that is not part of the surface Web, which is indexed by standard search engines. It is the vast reservoir of information stored in databases and sometimes dynamically generated only upon request, making it inaccessible to search engine, subject directories, and even intuitive searches. The deep Web is estimated to be approximately 550 times larger than the visible or service Web. In other worlds, 99.8% of the Web content is unavailable to traditional search engines.

2.7 Electronic commerce

E-commerce is the buying and selling of goods over the Internet. Shopping on the Internet is growing rapidly because it provides incentives for both buyers and sellers.
From the buyer's perspective, goods and services can be purchased at any time of day or night. Traditional commerce is typically limited to standard business hours when the seller is open. Additionally, buyers no longer have to physically travel to the seller's location.

From the seller's perspective, the costs associated with owning and operating a retail outlet can be eliminated. Another advantage is reduced inventory. Traditional stores maintain an inventory of goods in their stores and periodically replenish this inventory from warehouses. With e-commerce, there is no in-store inventory and products are shipped directly from warehouses.

There are 3 basic types of e-commerce

(1) **Business-to-consumer** (**B2C**) involves the sale of a product or service to the general public or end user. It eliminates the middlemen by allowing manufactures to sell directly to customers. Existing retail stores use B2C to reach customers.

It is the fastest-growing type of e-commerce today. The three most widely used B2C applications are for online banking, financial trading, and shopping.

(2) **Consumer-to-consumer** (**C2C**) involves individuals selling to individuals. It often takes the form of an electronic version of classified ads or an auction.

A recent trend in C2C e-commerce is the growing popularity of **Web auctions**. Web auctions are similar to traditional auctions except that buyers and sellers seldom, if ever, meet face-to-face. Sellers post descriptions of products at a Web site and buyers submit bids electronically.

There are two basic types of Web auction sites:

- **Auction house sites** sell a wide range of merchandise directly to bidders. The auction house owner presents merchandise that is typically from a company's surplus stock. These sites operate like a traditional auction, and bargain prices are not uncommon. Auction house sites are generally considered safe places to shop.
- **Person-to-person auction sites** operate more like flea markets. The owner of the site provides a forum for numerous buyers and sellers to gather. While the owners of these sites typically facilitate the bidding process, they are not involved in completing transactions or in verifying the authenticity of the goods sold. Buyers and sellers need to be cautious.

The most popular Web auction sites are:

Organization	Site
Amazon	www.auctions.amazon.com
WeBidz	www.webidz.com
eBay	www.ebay.com
Overstock	auctions.overstock.com

Table 2.6: Web auction sites

(3) **Business-to-business** (**B2B**) involves the sale of a product or service from one business to another. This is typically a manufacturer-supplier relationship. The most popular B2B e-commerce is for automobile parts, electronics including computer parts, and health care.

Web storefronts

Web storefronts are virtual stores for B2C e-commerce. Shoppers visit the stores on the Web to inspect merchandise and make purchases. Some of the most popular Web storefronts are:

Description	Site
Books	www.amazon.com
Music	www.cdnow.com
Computers and more	www.ncbuy.com

Table 2.7: Popular Web storefronts

Security

The single greatest challenge for e-commerce is the development of fast, secure, and reliable payment methods for purchased goods. The three basic payment options are check, credit card, and digital cash.

2.8 Cloud computing

Application programs are owned by individual or organizations and stored on their computer system's hard disks. **Cloud computing** uses the Internet and the Web to shift many of these computer activities from the user's computer to other computers on the Internet. It has the following advantages:

1. It serves as a means of marketing new products around the globe.
2. It frees users from owning, maintaining, and storing software and data.
3. It provides access to these services from anywhere through Internet connection.

The basic components of cloud computing are clients, the Internet, and service providers.

Figure 2.4: Cloud computing

- **Client:** Clients are corporations and end users who want access to data, programs, and storage. This access is to be available anywhere and anytime that a connection to the Internet is available. End users do not need to buy, install, and maintain application programs and data.
- **Internet:** The Internet provides the connection between the clients and the providers. Two of the most critical factors determining the efficiency of cloud computing are (1) the speed and reliability of the user's access to the Internet and (2) the Internet's capability to provide safe and reliable transmission of data and programs.
- **Service provider:** Service providers are organizations with computers connected to the Internet that are willing to provide access to software, data, and storage. These providers may charge a fee or may be free. For example, Google Apps provides free access to programs with capabilities similar to Microsoft's Word, Excel, and PowerPoint.

2.9 Web utilities

Web utilities are programs that make using the Internet and the Web easier and safer. Some of the utilities are Internet services for connecting and sharing resources over the Internet. Some of these utilities are browser-related programs that either become part of your browser or are executed from your browser.

2.9.1 Plug-ins

Plug-ins are programs that are automatically started and operate as a part of your browser. Many Web sites require you to have one or more plug-ins to fully experience their content.

Some widely used plug-ins include:

- Acrobat Reader from Adobe—for viewing and printing a variety of standard forms and other documents saved in a special format called PDF.
- Windows Media Player from Microsoft—for playing audio files, video files, and much more.
- QuickTime from Apple—for playing audio and video files.
- RealPlayer from Real Networks—for playing audio and video files.
- Shockwave from Adobe—for playing Web-based games and viewing concerts and dynamic animations.

Some of these utilities are included in many of today's browsers and operating systems. Others must be installed before they can be used by your browser.

2.9.2 Filters

Filters block access to selected sites. Filter programs allow parents as well as organizations to block out selected sites and set time limits. Additionally, these programs can monitor use and generate reports detailing the total time spent on the Internet and the time spent at individual Web sites, chat groups, and newsgroups. Some well-known filters include CyberPatrol, Cybersitter, and Net Nanny.

2.9.3 File transfer utilities

With file transfer utility software, you can copy files to your computer from specially configured servers. This is called **downloading.** You can use file transfer utility software to copy files from your computer to another computer on the Internet. This is called **uploading.** Three popular types of file transfer are **file transfer protocol** (FTP), **Web-based**, and **BitTorrent**.

2.9.4 Internet security suite

An Internet security suite is a collection of utility programs designed to maintain your security and privacy while you are on the Web. These programs control spam, protect against computer viruses, provide filters, and much more. Two of the best-known Internet security suites are **McAfee's Internet Security** and **Symantec's Norton Internet Security**.

2.9.5 Offline browsers

In order for a Web page to appear on your screen, its HTML document has to be downloaded from the Web site to your computer and executed. When the Internet is busy and/or the document is large, you spend a fair amount of time waiting. Offline browsers, also known as **Web-downloading utilities**, are programs that automatically connect to selected Web sites, download HTML documents, and save them to your hard disk. You can view the Web page later without being connect to the Internet. Two popular off-line browsers are InContexct FlashSite and Teleport Pro.

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LECTURE 3: **BASIC APPLICATION SOFTWARE**

Learning Objectives

At the end of the lecture the student is expected to be able to do the following:

1. Identify general-purpose applications.
2. Describe word processors, spreadsheets, presentation programs, and database management systems.
3. Identify specialized applications.
4. Describe graphics programs
5. Identify software suites.
6. Describe office suites, cloud suites, specialized suites, and utility suites.

Not long ago, trained specialists were required to perform many of the operations you can now do with a microcomputer. Secretaries used typewriters to create business correspondence. Market analysts used calculators to project sales. Graphic artists created designs by hand. Data processing clerks created electronic files to be stored on large computers. Now you can do all these tasks—and many others—with a microcomputer and the appropriate application software.
Competent end users need to understand the capabilities of basic application software, which includes word processors, spreadsheets, database management systems, and presentation programs. They need to know about integrated packages and software suites. Basic application software are also known as **general-purpose applications**.

3.1 Common features

Some features are common to all kinds of applications.

-Version and release
Software are continually being improved and revised. When a software first appears, it is assigned the number 1.0. As the software improves, the number changes. The number before the period refers to the **version**; the number after the period refers to the **release**. Changes in version numbers indicate major changes; changes in release refer to minor changes.

-Graphical user interface (GUI)
A **user interface** is the portion of the application that allows you to control and to interact with the program. Most applications use a **graphical user interface (GUI)** that displays graphical elements called **icons** to represent familiar objects and a mouse. The mouse controls a **pointer** on the screen that is used to select items such as icons.

Another feature is the use of windows to display information. A **window** is simply a rectangular area that can contain a document, program, or message. More than one window can be opened and displayed on the computer screen at one time.
Insertion point or cursor is a blinking vertical bar on the screen, but it can have other shapes as well. It shows where you can enter your next data. It can be moved around by the mouse or the directional arrow keys.

-Menus
Traditionally, most software programs, including those in Microsoft Office 2003, use a system of menus, toolbars, dialog boxes, and buttons. **Menus** present commands that are typically displayed in a **menu bar** at the top of the screen. When one of the menu items is selected, an additional list of menu options or a **dialog box** that provides additional information and requests user input may appear. **Toolbars** typically appear below the menu bar. They contain small graphic elements called **buttons** that provide shortcuts for quick access to commonly used commands.
Microsoft Office 2010 uses an interface introduced in Office 2007 that makes it easier for users to find and use all the features of an application. This new design introduces ribbons, tabs, galleries, and more.

- **Ribbons** replace menus and toolbars by organizing commonly used commands into a set of tabs. These tabs display command buttons that are the most relevant to the tasks being performed by the user.
- **Tabs** are used to divide the ribbon into major activity areas. Each tab is then organized into **groups** that contain related items. Some tabs, called **contextual tabs**, only appear when they are needed and anticipate the next operations to be performed by the user.
- **Gallaries** simplify the process of making a selection from a list of alternatives. This is accomplished by displaying small graphic representations of the alternatives.

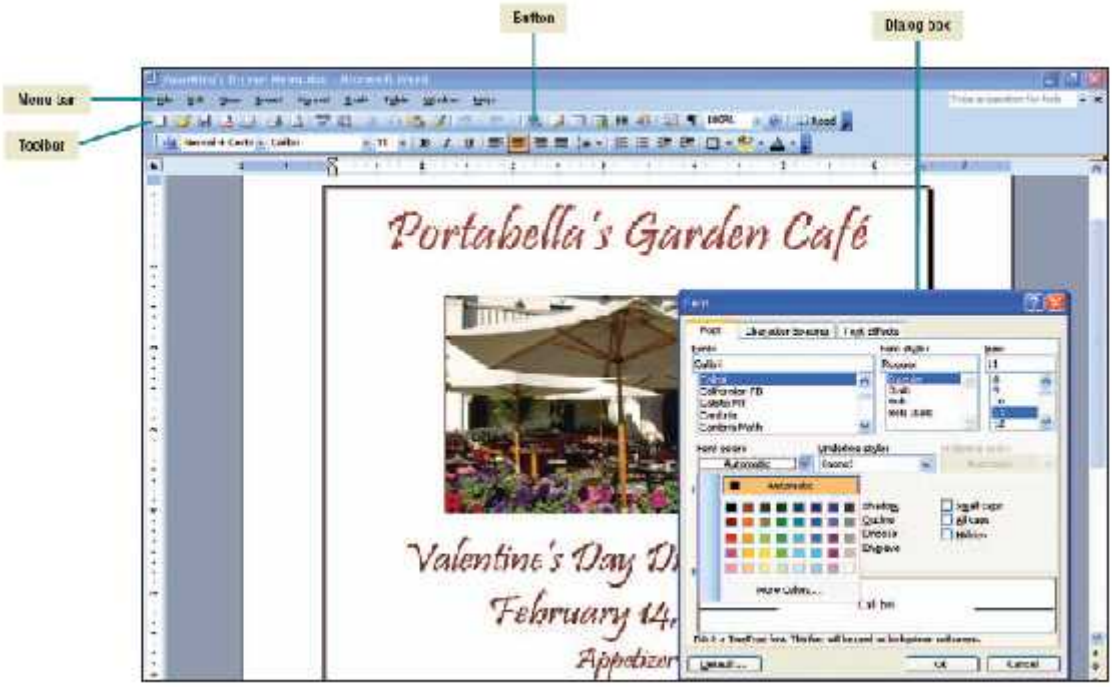

Figure 3.1: Microsoft office word 2003 interface

Figure 3.2: Microsoft office word 2007 interface

This new interface is the first major change in over a decade and promises to greatly improve user functionality and efficiency.

3.2 Word processors

Word processors create text-based documents such as reports, letters, memos, faxes, newsletters, manuals, brochures… They are used not only by secretaries, but extensively in managerial and professional life.
Microsoft Word is the most widely used word processor. Other popular word processors include **Corel WordPerfect** and **Apple Pages**.

3.2.1 Common Features

Word processors provide a variety of features to make entering, editing, and formatting documents easy.

-Word wrap feature automatically moves the insertion point to the next line once the current line is full. As you type, the words wrap around to the next line.

-Editing or modifying a document
a. Thesaurus provides synonyms, antonyms, and related words for a selected word or phrase.
b. Find and replace can quickly locate and replace selected words.
c. Spelling and grammar checkers look for misspelled words and problems with capitalization, punctuation, and sentence structure.

-Formatting a document

a. Font and font size. Font is the design of characters and the height/size of a character is the font size.

b. Character effects such as **bold**, ***italic***, **underline**, and **color** are used to enhance the appearance of characters.

c. Style enables users to quickly apply a predefined set of formatting characteristics to text in one easy step rather than individually selecting specific fonts, sizes, and formats.

3.3 Spreadsheet

Spreadsheet programs organize, analyze, and graph numeric data such as budgets and financial reports. Once used exclusively by accountants, spreadsheets are widely used by nearly every profession.

The most widely used spreadsheet program is **Microsoft Excel**. Other spreadsheet applications include **Apple iWork's Numbers** and **Corel Quattro Pro**.

3.3.1 Common Features

Unlike word processors, which manipulate text and create text documents, spreadsheet programs manipulate numeric data and create workbook files.

Workbook files consist of one or more related worksheets. A **worksheet,** also known as a **spreadsheet** or **sheet,** is a rectangular grid of **rows** and **columns.** Columns are identified by letters and the rows are identified by numbers. The intersection of a row and column creates a **cell.**

A cell can contain text or numeric entries. **Text entries** or **labels** provide structure to a worksheet by describing the contents of rows and columns.

A **numeric entry** can be a number or a formula. A **formula** is an instruction to calculate or process. **Functions** are prewritten formulas provided by the spreadsheet program that perform calculations such as adding a series of cells. A **range** is a series of continuous cells.

Analytical graphs or **charts** are visual representations of data in a spreadsheet. Spreadsheet can perform **recalculations** and **what-if-analysis**.

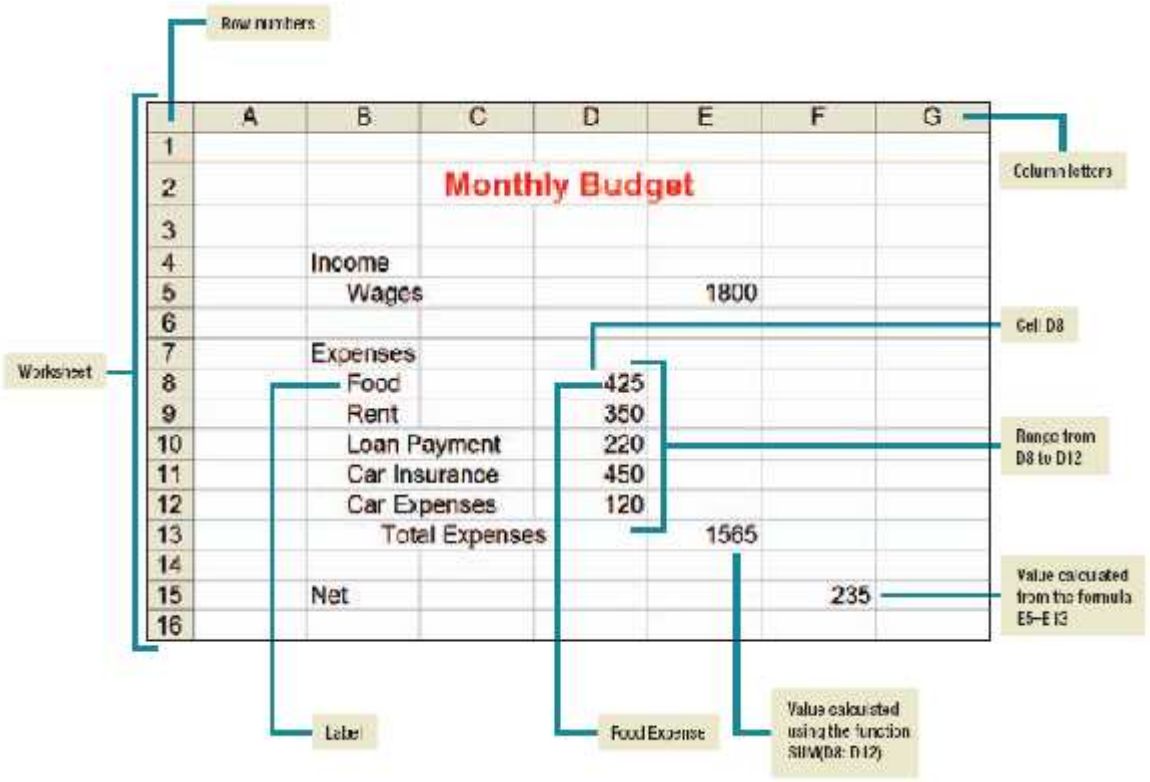

Figure 3.3: Worksheet

3.4 Database Management Systems

A **database** is a collection of related data. It is the electronic equivalent of a file cabinet. A **database management system (DBMS)** or **database manager** is a program that sets up, or structures, a database. It also provides tools to enter, edit, and retrieve data from the database. All kinds of individuals use databases to keep records of people, places, and things.

The most widely used database management system designed for microcomputers is **Microsoft Access**. Other database management systems include **Corel Paradox** and **dBASE**.

3.4.1 Common Features

The **relational database** is the most widely used database structure. Data is organized into related **tables.** Each table is made up of rows called **records** and columns called **fields.** Each record contains fields of data about some specific person, place, or thing.

A DBMS provides a variety of tools to create and use databases. A **sort** tool will quickly rearrange a table's records according to a selected field. A **filter** tool will quickly display only those records meeting the conditions you specify.

The greatest power of a DBMS, however, comes from its ability to quickly find and bring together information stored in separate tables using queries, forms, and reports. A **query** is a question or a request for specific data contained in a database. Database **forms** look similar to traditional printed forms. These electronic forms are displayed on the computer monitor and typically reflect the contents for one record in a table. They are primarily used to enter new

records and to make changes to existing records. Data from tables and queries can be printed in a variety of different types of **reports** from a simple listing of an entire field in a table to a list of selected fields based on a query involving several tables.

3.5 Graphics

Research shows that people learn better when information is presented visually.

There are 3 types of graphic programs:

(1) **Analytical graphics** are used to analyze data. Numerical data in tables are much more difficult to understand than charts. They come as part of spreadsheet programs like Excel.

(2) **Presentation graphics** are programs that combine a variety of visual objects to create attractive, visually interesting presentations. They are excellent tools to communicate a message and to persuade people. For example, marketing managers use presentation graphics to present proposed marketing strategies to their superiors. Salespeople use these programs to demonstrate products and encourage customers to make purchases. Students use presentation graphics programs to create high-quality class presentations.

Features

An electronic presentation consists of a series of **slides** or **pages.** Presentation programs include a variety of features to help you create effective dynamic presentations. **Templates** are professionally designed layouts with sample text. **Design templates** provide professionally selected combinations of color schemes, slide layouts, and special effects.

Content templates include suggested content for each slide. Other features include tools to select alternative color schemes and slide layouts, to create animated graphics and charts, and to help you rehearse the presentation.

More advanced features include the capability to use **animations,** special effects that add action to text and graphics on a slide. Additionally, **transitions** can be used to animate how the presentation moves from one slide to the next. Other features allow you to print slides, create speaker notes, and provide handouts for your audience.

The most widely used presentation graphics programs are:

- Microsoft PowerPoint
- Corel Presentation
- Lotus Freelance Graphics

(3) **Drawing programs for illustration** are used by people doing commercial art or drafting.
A

Few of the many drawing programs available include:

- Adobe Illustrator
- Micrografx Designer
- Autocad
- Microsoft Visio, etc

3.6 Integrated packages

An **integrated package** is a single program that provides the ***functionality*** of a word processor, spreadsheet, database manager, and more. The primary disadvantage of an integrated package is that the capabilities of each function are not as extensive as in the individual programs. The primary advantages are cost and simplicity. The cost of an integrated package is much less than the cost of the individual powerful, professional-grade application programs.

Integrated packages are popular with many home users and are sometimes classified as **personal** or **home software.** The most widely used integrated package is **Microsoft Works**. **AppleWorks** is also widely used.

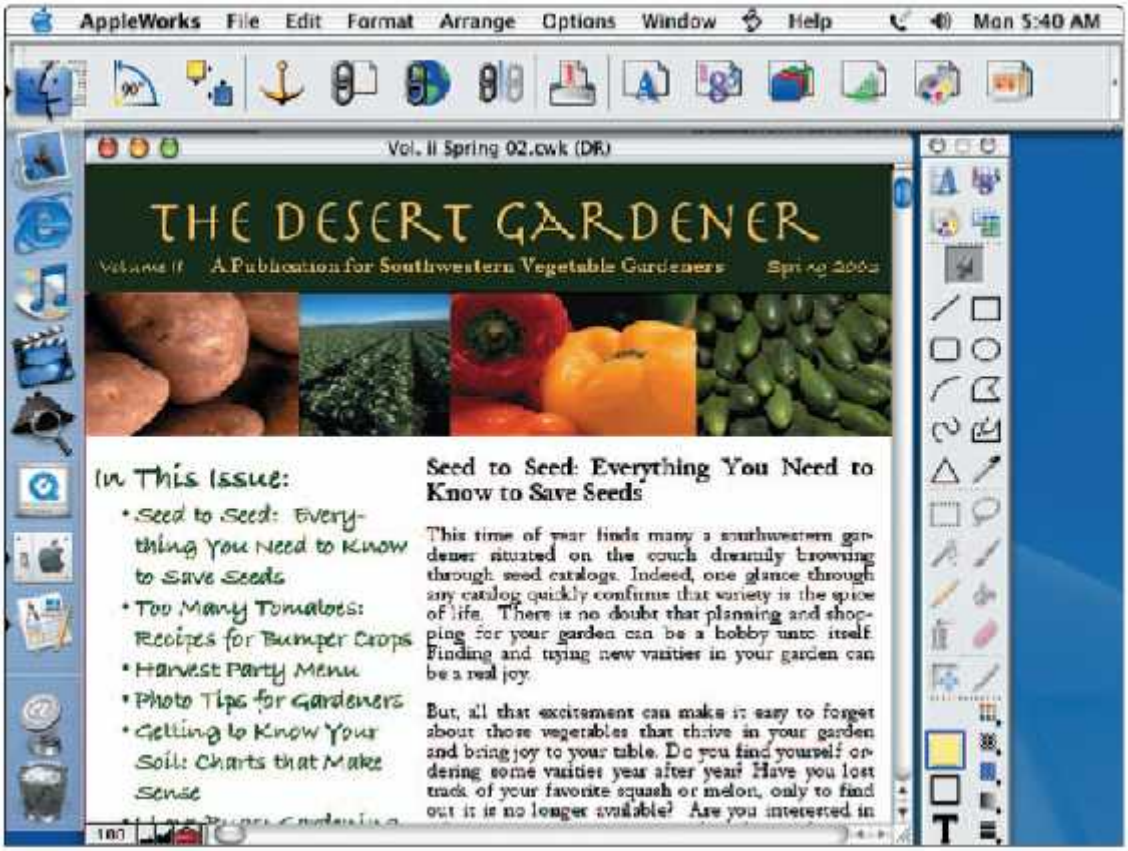

Figure 3.4: Integrated package (Microsoft Works)

3.7 Software suites

A **software suite** is a collection of separate application programs bundled together and made available as a group. While the applications function exactly the same whether purchased in a suite or separately, it is significantly less expensive to buy a suite of applications than to buy each application separately.

3.7.1 Productivity suites

Productivity suites, also known as **office software suites** or simply **office suites,** contain professional-grade application programs that are typically used in a business situation including a

word processor, spreadsheet, database manager, and more. The best known is **Microsoft Office**. Other well-known productivity suites are **Apple iWork**, **Sun StarOffice**, **Corel WordPerfect Office Suite**, and **Lotus SmartSuite**.
Traditionally, when you purchase an office suite you are licensed to use the application and a copy of the software is stored on your computer. Recently, however, several alternative office suites have been made available for free as downloadable software. Popular downloadable office suites include **Star-Office**, **IBM Lotus Symphony**, and **OpenOffice**.

3.7.2 Cloud computing

Cloud suites or **online office suites** are stored at a server on the Internet and are available anywhere you can access the Internet. Documents created using online applications also can be stored online, making it easy to share and collaborate on documents with others. Popular online office suites include **Google Docs**, **Zoho**, and **ThinkSmart**.

3.7.3 Specialized and utility suite

Specialized suites focus on specific applications. These include graphics suites, financial planning suites, and many others.
Utility suites include a variety of programs designed to make computing easier and safer. Two of the best known are **Norton SystemWorks** and **Norton Internet Security Suite**.

3.8 Sharing data between applications

Many times it is convenient to share data between applications. For example, when writing a report, it may be useful to include a chart from a spreadsheet or data from a database. Data created by one application can be shared with another application in a variety of different ways, including copying and pasting, object linking, and object embedding.

3.8.1 Copy and paste

When you copy an item from a file, you can paste it into another file even in another application. This is a static copy in that any changes to one file will not reflect in the other.

3.8.1 Object linking and embedding (OLE)

Object linking and embedding is a powerful feature of many application programs. It is a way of dynamically sharing and exchanging data between applications. For example, you could create a chart in Excel and then use it in a Word document. Whenever the text document is opened, the most up-to-date version of the chart would appear in the document.
With **object linking**, a copy of the object from the **source file** (the file containing the object) is inserted in a **destination file** (the file receiving the object) and a **link** between the two files is established. If a change occurs in the source file that affects the object, the link between the two files will automatically update the destination file.

With object embedding, the object from the source file is embedded or added to the destination file and becomes part of the destination file. The embedded object can be edited from within the destination file. However, changes you make to the embedded object are not reflected in the original file.

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LECTURE 4: **SPECIALIZED APPLICATION SOFTWARE**

Learning Objectives

At the end of the lecture the student is expected to be able to do the following:

1. Identify specialized applications.
2. Describe graphics software, including desktop publishing, image editors, illustration programs, image galleries, and graphics suites.
3. Discuss audio and video editing software.
4. Describe multimedia, including links, buttons, and multimedia authoring programs.
5. Explain Web authoring, Web site design, and Web authoring programs.
6. Describe artificial intelligence, including virtual reality, knowledge-based systems, and robotics.
7. Discuss mobile apps and apps stores.

Software, that for years was available only for larger computers (mainframe and supercomputers) have become available for microcomputers and smart-phones. This new generation of specialized applications makes it possible to perform advanced tasks at home. For example, it is now possible, and quite common, for people to create their own Web sites. Home users also have access to software that helps manipulate and create graphic images. Many musicians and artists work from home to create complex and beautiful work using specialized applications. You can use your cell phone to surf the Web, scan documents, and even update your blog from almost any location.

Some of these same technological advances have allowed researchers and computer scientists to make advances in the field of artificial intelligence that previously were envisioned only in science fiction. Robots now provide security and assistance in homes. Virtual reality is providing opportunities in the fields of medicine and science but also commonly appears in video games. The wireless revolution has brought even more exciting applications to cell phones and other mobile devices.

These advanced applications include graphics programs, audio and video editing software, multimedia, Web authoring, and artificial intelligence, including virtual reality, knowledge-based systems, and robotics.

4.1 Graphics

4.1.1 Desktop publishing

Many publications – most books and magazine – are created by professionals trained in graphic arts and typesetting. They use equipment that cost several thousands of dollars. However, there are many publications where such experiences and expenses are not necessary, e.g. newsletter, forms, catalogs, brochures, menus, posters, advertisements, funeral announcements, etc

Desktop publishing programs, or page layout programs, allow you to mix text and graphics to create publications of professional quality. While word processors focus on creating text and have the ability to combine text and graphics, desktop publishers focus on page design and layout and provide greater flexibility.

Popular desktop publishing programs include:

- Adobe InDesign,
- Microsoft Publisher
- QuarkXPress

While these programs provide the capability to create text and graphics, typically graphic artists import these elements from other sources, including word processors, digital cameras, scanners, image editors, illustration programs, and image galleries.

4.1.2 Image Editors

Image editors or **paint programs** are programs for creating and editing bitmap images. **Bitmap images,** also known as **raster images,** use thousands of dots or **pixels** to represent images. Each dot has a specific location, color, and shade. One limitation of bitmap images, however, is that when they are expanded, the images can become pixilated, or jagged on the edges.

Image editors, also known as **photo editors,** are specialized graphics programs for editing or modifying digital photographs.
Popular image editors include:

- Adobe Photoshop
- Corel Paint Shop Pro
- Paint.NET

Figure 4.1: Adobe Photoshop

4.1.3 Illustration Programs

Illustration programs, also known as **drawing programs,** are used to create and edit vector images. **Vector** is another common type of graphic file. While bitmap images use pixels to represent images, **vector images,** also known as **vector illustrations,** use geometric shapes or objects. These objects are created by connecting lines and curves. Because these objects can be defined by mathematical equations, they can be rapidly and easily resized, colored, textured, and manipulated. An image is a combination of several objects.

Popular illustration programs include:

- Adobe Illustrator
- CorelDRAW,
- Inkscape.

4.1.4 Image Gallery

Image galleries are libraries of electronic images. These images are used for a wide variety of applications from illustrating textbooks to providing visual interest to presentations. There are two basic types of electronic images in these galleries:

(1) **Stock photographs** —photographs on a variety of subject material from people to landscapes.

(2) **Clip art** —graphic illustrations representing a wide range of topics. Most applications provide access to a limited selection of free clip art.

There are numerous Web image galleries. Some of these sites offer free images and clip art while others charge a fee.

Organization	Site
Classroom clipart	www.classroomclipart.com
ClipArt.com	www.clipart.com
Graphics Factory	www.graphicsfactory.com
MS Office clip art	office.microsoft.com/clipart
iStockphoto	istockphoto.com

Table 4.1: Selected Web image galleries

4.1.5 Graphic Suites

Some companies have combined or bundled their separate graphics programs in groups called **graphics suites.** Two popular suites are:

- CorelDRAW Graphics Suite
- Adobe Creative Suite

CorelDRAW Graphics Suite includes five individual graphics programs plus a large library of clip art, media clips, and fonts.

4.2 Audio and video

Digital **video editing software** allows you to reorganize, add effects, and more to your digital video footage. Two commonly used video editing software programs are:

- Apple iMovie
- Windows Movie Maker

These programs are designed to allow you to assemble and edit new home videos and movies from raw digital video footage.

Audio editing software allows you to record and edit audio clips. You can add audio effects, like filters, to your tracks. For example, you can use this type of software to filter out pops or scratches in an old recording. You can even use this software to create your own MP3s. Some commonly used audio editing software programs are:

- Apple GarageBand
- Sony ACID

4.3 Multimedia

Multimedia is the integration of all sorts of media into one presentation. For example, a multimedia presentation may include video, music, voice, graphics, and text.

Effective multimedia presentations incorporate user participation or interactivity. **Interactivity** allows the user to choose the information to view, to control the pace and flow of information, and to respond to items and receive feedback. When experiencing an interactive multimedia presentation, users customize the presentation to their needs. Users are able to select the language to be used and decide whether to include sound.

Multimedia need a powerful microcomputer: fast processor and a large hard drive, soundboard, speakers and a CD-ROM drive (1 minute of video with stereo sound required 25 MB of disk space).

4.3.1 Links and Buttons

An interactive multimedia presentation is typically organized as a series of related pages. Each page presents information and provides **links,** or connections, to related information. These links can be to video, sound, graphics, and text files, and to other pages and resources. By clicking special areas called **buttons** on a page, you can make appropriate links and navigate through a presentation to locate and discover information. Typically, there are several buttons on a page. You can select one, several, or none of them. You are in control. You direct the flow and content of the presentation.

4.3.2 Multimedia authoring programs

Multimedia authoring programs are special programs used to create multimedia presentations. They bring together all the video, audio, graphics, and text elements into an interactive framework. Widely used authoring programs include:

- Adobe Director
- Toolbook.

4.4 Web Authoring

There are over a billion Web sites on the Internet, and more are being added every day. Corporations use the Web to reach new customers and to promote their products. Individuals create their own personal sites, called **blogs.** Creating a site is called **Web authoring.** It begins with site design followed by creation of a document file that displays the Web site's content.

4.4.1 Web site design

Corporations create Web sites to reach customers and individuals create blogs to stay in touch with friends and family.

A Web site is an interactive multimedia form of communication. Designing a Web site begins with determining the site's overall content. The content is then broken down into a series of related pieces of information. The overall site design is commonly represented in a **graphical map.**

Notice that in the graphical map shown in figure 4.2, each block in the map represents a Web page. Lines joining the blocks represent links to related pages of information that make up the Web site.

The first page, or home page, typically serves as an introduction and supplies a table of contents. The following pages present the specific pieces or blocks of information. Multimedia content like animation are added.

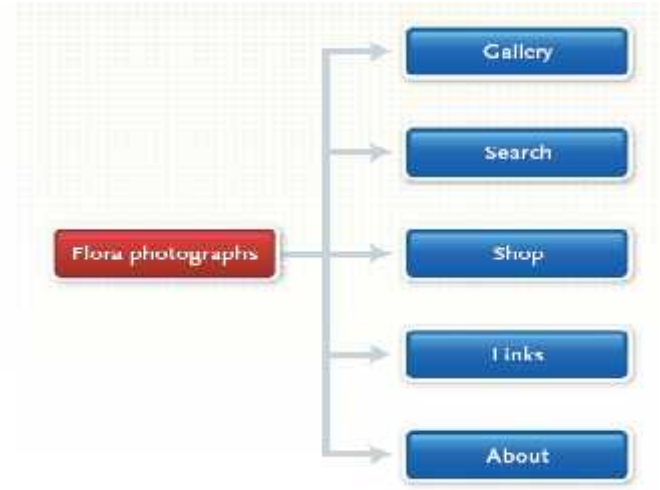

Figure 4.2: Partial graphical map for the Flora Photographs Web site

4.4.2 Web authoring programs

Web pages are typically HTML documents. With knowledge of HTML and a simple text editor, you can create Web pages. Even without knowledge of HTML, you can create simple Web pages using a word processing package like Microsoft Word.
More specialized and powerful programs, called **Web authoring programs,** are typically used to create sophisticated commercial sites. Also known as **Web page editors** and **HTML editors,** these programs provide support for Web site design and HTML coding. Some Web authoring programs are **WYSIWYG** (**what you see is what you get**) **editors,** which means you can build a page without interacting directly with HTML code. WYSIWYG editors preview the page described by HTML code. Widely used Web authoring programs include:

- Adobe Dreamweaver
- NetObjects Fusion
- Microsoft Expression.

4.5 Cell phone apps

Cell phone applications are add-on features to a cell phone that allow users to perform a variety of tasks not typically associated with cell phone use. The traditional applications include address books, to-do lists, alarms, and message lists. With the introduction of smartphones and wireless connections to the Internet, cell phone capabilities have exploded. Now, a number of specialized applications are available.

4.5.1 Apps

Some of the most widely used cell phone apps are text messaging, Internet browsing, and connecting to social networks. Many apps are written for a particular type of cell phone and will not run on other types. For example, a cell phone app designed for Apple's iPhone may not work with Google's Android.

App	Description	Site
Facebook	Connects to Facebook	facebook.com
Gmail	Access e-mail from any computer	mail.google.com
Games.com	Access to single- and multiplayer games	www.games.com
Photoshop Express	Photo sharing and editing site	www.photoshop.com/express
ESPN	Sports information and scores	www.espn.go.com

Figure 4.3 Mobile apps

4.5.2 Apps store

An app store is typically a Web site that provides access to specific cell phone apps that can be downloaded either for a nominal fee or free of charge. Two of the best-known stores are Apple's App Store and Android Market.

App	Focus	Site
Apple App Store	iPhone	www.appstore.com
Android Market	Smartphones using Android operating system	www.android.com/market
BlackBerry App World	BlackBerry products	www.appworld.com
GetJar	Variety	www.getjar.com
Handango	Variety	www.handango.com
Windows Phone Store	Smartphones using Windows Phone 7 operating system	www.microsoft.com/WindowsPhone

Figure 4.4 Apps stores