Chapter 2 : Fundamentals of the World Wide Web and Internet

Internet(Net) : worldwide collection of networks that link a lot of sectors together

## • Evolution of the Internet

➢ **Advance Research Projects Agency (ARPA)** *– This is an agency of the US department of Defense. The internet originated as ARPANET in 1969*

➢ **World Wide Web Consortium(W3C)** *– group oversees research and set standards and guidelines of the Internet*

➢ **Internet2(I2)** *– not for-profit Internet-related research which focus on improving the efficiencies of the Internet*

Access provider : *a business that provides individuals access to the Internet*

- *Internet Service Provider(ISP)*
- *Online Service Provider(OSP)*
- *Wireless Internet Service Provider*

Internet Address

- *IP address*
- *Domain name*
- *DNS server – converts the domain name into IP address*
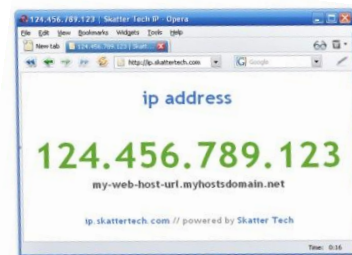
IP ADDRESS

• World Wide Web

World Wide Web(Web,WWW) : *worldwide collection of electronic documents*

Webpage: *a document that contain text, graphic, video*

Web site : *collection of related Webpage*

Web server : *computer that delivers requested Web pages to your computer*

Web 2.0 : *allows users to modify Website content*

Web browser : *allows users to access Web pages and Web2.0 program* <u>such as</u> *Internet Explorer ,Google Chrome, Safari and Fire fox.*

Two types of search tools :

1. Search engine
2. Subject directory

Multimedia :
1. Graphic : *a digital representation of nontext information* <u>such as</u> drawing or chart
2. Animation : motion created by displaying a series of still images in consequences
3. Audio : music, speech or other sound
4. Video : full motion images played back at various speed, also accompanying audio
5. Virtual reality(VR) : simulate a real environment that appears as a 3D space

- ## E-Commerce

E-Commerce : *a business transaction that occurs over an electronic network*
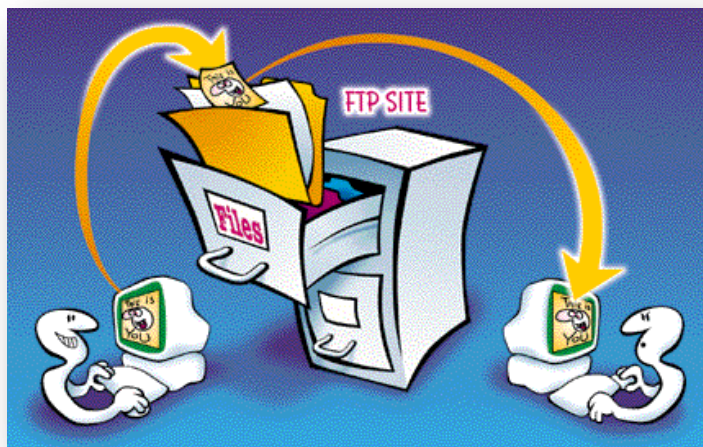
3 types of E-Commerce :

1. Business to Business(B2B)
2. Consumer to Consumer(C2C)
3. Business to Consumer(B2C)

- ## Other Internet Services

Email : *transmission of messages and files via a computer network*

File Transfer Protocol (FTP) : *allows you to upload and download files with other computers on Internet.*

FILE TRANSFER PROTOCOL

Newsgroups : *online area which users can write discussions about a particular subject*

Mailing list : *group of e-mail names and addresses given a single name*

Chat rooms: *a real-time typed conversation on computers*

Instant Messaging : *a real-time Internet conversations service that notifies you when someone is online* <u>such as</u> *MSN*

Voice over IP(VOIP) : *allows users to speak to other users over the internet on computers* <u>such as</u> *Skype*

Chapter 3 : Software for Systems

Application software : all the computer software that causes a computer to perform useful tasks beyond the running of the computer itself.

Four categories of Application software

1. Business Software
2. Graphic and multimedia Software
3. Home/Personal/Educational Software
4. Communication Software

Seven available forms of software

1. Packaged Software – It's already made such as Microsoft office
2. Custom Software – creating a new one according to your want
3. Web application – Web site that allows users to access and interact with software from any computer or device which is connected to the internet such as Google docs
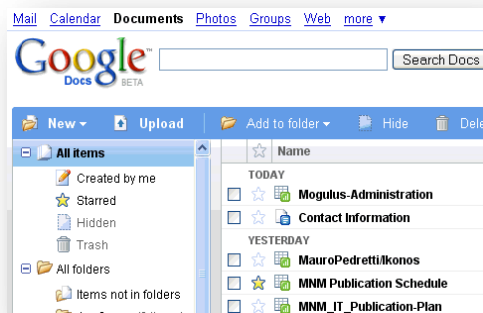
GOOGLE DOCS

4. Open source Software – users can modify source code/program such as Firefox, Android
5. Shareware – can use software for free during "trial" period such as Microsoft office 365
6. Freeware – can use software for free all the time such as Adobe reader

ADOBE READER

7. Public-domain Software – no restriction

Relationship between system software and application software

System Software provides the interface that link between users, hard ware, and application software. For example, Hardware (such as printer) ←→ System Software (such as Microsoft Windows 7) ←→ Application Software (such as Microsoft Power Point)

| PRINTER | WINDOWS7 | POWER POINT |
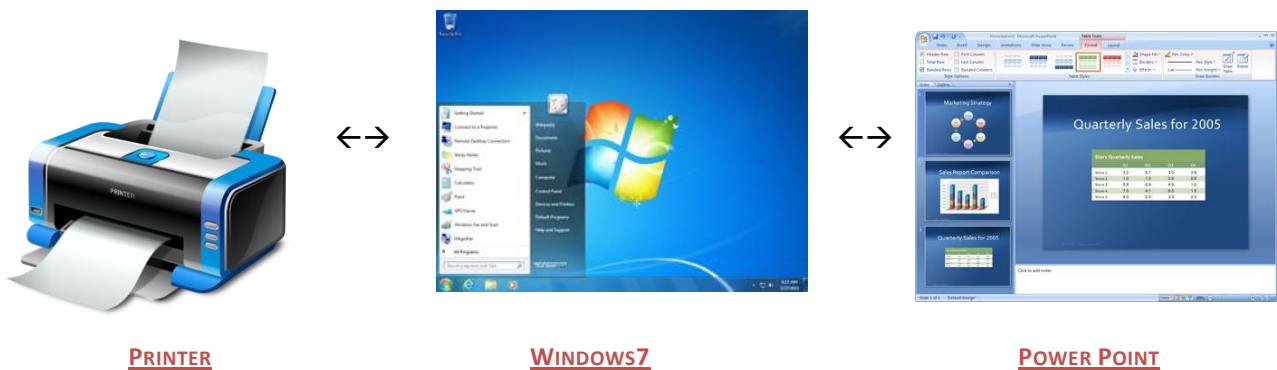
Business software

Business software : software that helps users performing business activities

- Word processing software – users can create documents
- Spreadsheet software – users can organize data in rows and columns and do calculations
- Database Software – users can create, access, and manage a database
- Presentation software – users can create visual aids for presentations
- Note taking software – users can enter typed text, handwritten comments, or drawing anywhere on a page
- Software suite – collection of individual programs such as Microsoft Office(MS Word,Excel,Power Point)
- Personal information manager(PIM) – manage your reminder and schedule
- Business software for phones
- Project management software – users can plan, schedule, track, analyze the events and cost of a project.
- Accounting software – record and report financial transactions of a company
- Document management software - such as Acrobat reader PDF
- Enterprise computing software

# Graphic and multimedia software

Graphic and multimedia software : is a subclass of application software used for graphic design, multimedia development, stylized image development, technical illustration, general image editing, or simply to access graphic files*.*

- Computer-aid design software(CAD)
- Desktop publishing software
- Paint/ Image editing software
- Professional photo editing software – such as Photoshop

- Video and audio editing software – <u>such as</u> Movie Maker
- Multimedia authoring software – <u>such as</u> Adobe Dreamweaver
- Web page authoring software – It can help users of all skill levels create Web pages

Home/Personal/Educational software

- Personal finance software – record income and expenses
- Legal software – make contracts or wills
- Tax preparation software
- Personal DTP software
- Personal paint/image editing software
- Personal photo editing software
- Clip art/image gallery
- Video and audio editing software
- Home design/landscaping software
- Travel and mapping software – such as Google map
- Reference software – such as Dictionary
- Educational software
- Entertainment software – such as Games
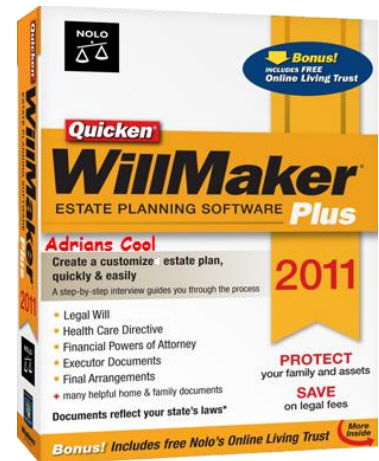
WILL MAKER (LEGAL SOFTWARE)

Communication software

- Web browser
- E-mail - <u>such as</u> Hotmail
- Chat room
- Blogging
- News group - forum
- FTP – back up, uploading (cloud storage)
- VoIP – <u>such as</u> Skype
- Video conference

SKYPE (VOIP)

Learning tools for application software

- Online help – It's an electronic equivalent of a user manual. It doesn't need Internet connection. It comes up with topic that you key.
- Web-based help – It needs internet connection. It gives updates resources to respond to technical issues about software.
- Web-based training – facilitate students to learn. It's a type of CBT.
- Distance learning(DL) – <u>such as</u> E-learning, online course

Chapter 8 : Types of Utility Programs and Operating Systems

System software

System software : computer software designed to operate and control the computer hardware and to provide a platform for running application software. System software includes the following:

- Operating system – such as Microsoft Windows, Mac OS X, Linux. It allows the parts of a computer to work together by performing tasks like transferring data between memory and disks or rendering output onto a display device. It also provides a platform to run high-level system software and application software.
- Utility programs – taking care a computer. It helps to analyze, configure, optimize and maintain the computer.

Operating system function

Booting : process of starting or restarting a computer

- Cold boot – turn on a computer that has been powered off completely
- Warm boot – use the operating system to restart a computer

Various shut down options

- Sleep mode – saves documents and programs to "RAM"
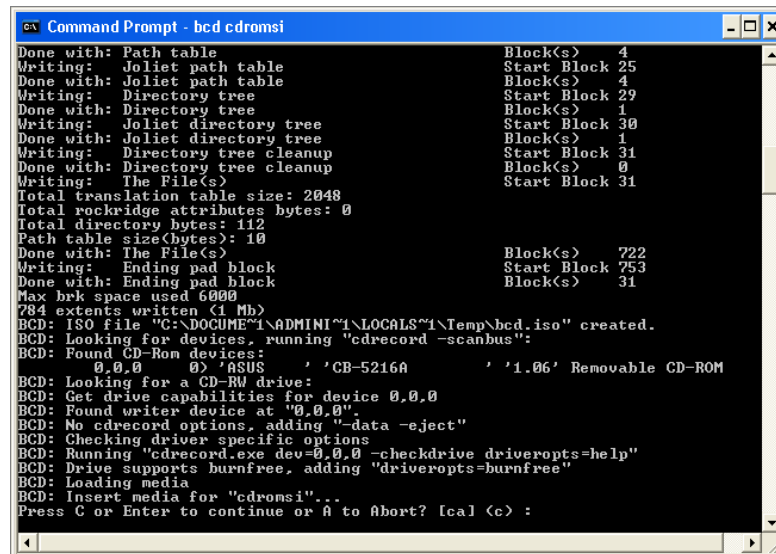- Hibernate - saves documents and programs to "a hard disk"

Types of User interface

1) Graphical user interface(GUI) - users interact with menus and visual images such as Microsoft Windows
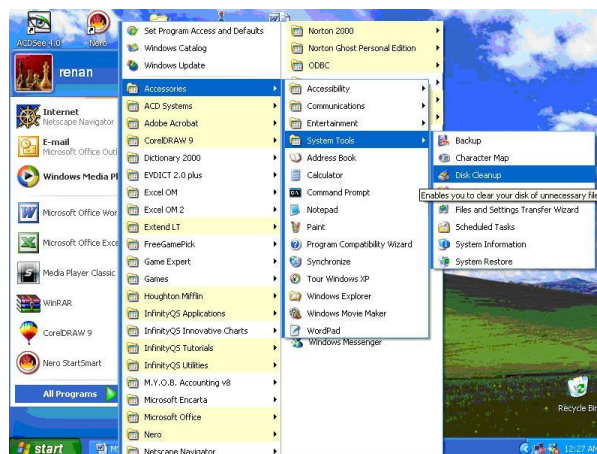
MICROSOFT WINDOWS'S INTERFACE

2) Command- line interface –users use the keyboard to enter data and instructions such as DOS

Types of Operating system

1. Stand –alone operating system
2. Server operating system
3. Embedded operating system

Utility programs

- File manager – organize files in folders
- Search utility – easy to search for a file by using search criteria
- Image viewer – display, copy, print the images
- Uninstaller- removes a program
- Disk cleanup utility – removes unnecessary files
- Disk defragmenter – reorganizes the area on a computer's hard disk
- Backup utility – copy files to another storage
- Screen saver –returns back up files to their original form
- Screen saver – shows blank screen when there is no activity
- Personal firewall – for security purpose
- Antivirus program – protects a computer against viruses
- Spyware remover – detects and deletes spyware
- Adware remover – detects and deletes adware
- Filter- removes or blocks items from being shown
- File compression utility –reduce the size of a file
- Media player- enable users to view images, videos, and listen to music
- Disc burning software – write files on recordable optical disc
- Personal computer maintenance utility – fixes operating system problems

Chapter 9 : Networks and Communications

Communications

Communication is a process in which two or more computers transfer data, instructions, and information.

Uses of Computer Communications

1. Internet Telephone(Voice Over IP) : can talk to others via the Internet
2. Wireless Messaging Services : send message via the Internet
3. Public Internet Access Points : connect to the Internet wirelessly such as Hot spot and Cyber cafes
4. Global positioning system(GPS) : determine the receiver's geographic location
5. Collaboration : work online with other users connected to server
6. Groupware : helps groups of people work together on projects
7. Voice mail : can leave a voice message
8. Web services : applications that communicate with other remote computers over the internet

Networks

Network is a collection of computers and devices connected together via communication devices and transmission media

Types of Network

1. Local Area Network (LAN) – connect in limited areas such as office, university
2. Metropolitan Area Network (MAN) – connect in metropolitan areas such as cities, countries
3. Wide Area Network(WAN) – connect in a large area such as Internet

Network Architecture

- Client& Server – Servers provide centralized storage area. Clients use the resources from severs.
- Internet Peer to Peer(P2P) –users connect directly to each other's hard disks. No server,No clients, everyone in networks is equal.

Network Topologies

1. BUS Network : It can transmit in both directions(Backbone)
2. Ring Network : It can transmit one direction
3. Star Network : all devices connect to a central computer(Hub/Switch)

Networks Communication Standards

1. Ethernet
2. Token ring
3. TCP/IP
4. 802.11(WiFi)
5. Bluetooth
6. UWB
7. IrDA
8. WiMax
9. WAP
10. Intranet&Extranet
    - Intranet- network within a company, only company's staff can access the network
    - Extranet- customers and suppliers can access the company's network

Communication Devices

1. Dial-Up Modem : convert a digital signal into an analog signal and send it through telephone lines.
2. ISDN and DSL Modems
3. Cable Modems : send and receive data through cable TV
4. Wireless Modems
5. Network Interface Card : LAN adaptor
6. Wireless Access Point
7. Routers : connect multiple computers
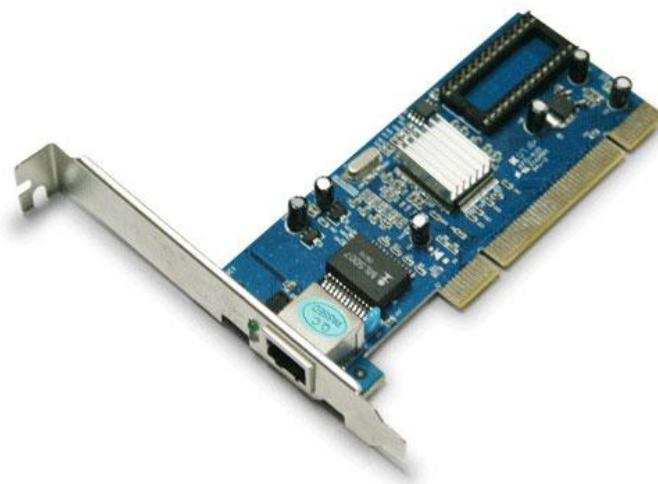
NETWORK INTERFACE CARD

Transmission Media

1. Physical Transmission Media
   - Twisted Pair Cable : such as telephone line / quality-low
   - Coaxial Cable : such as Cable TV line / quality-medium
   - Fiber Optic Cable : consists of hundreds of thin glass that use light to transmit signals/ quality-high
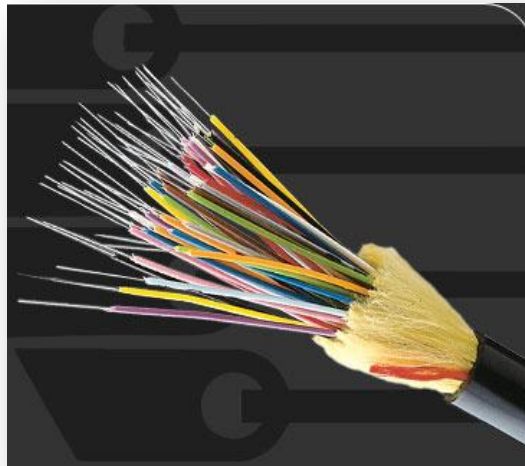
FIBER OPTIC CABLE

2. Wireless Transmission Media
   - Broadcast Radio : distribute radio signals trough the air over long distance
   - Cellular Radio : radio signals used in cellular telephones
   - Microwaves : send signals from one microwave station to another
   - Communications satellite : space station that receives microwave signal and send it back to many earth-based station
   - Infrared : send signals by using infrared light

Chapter 10 : Managing a database

Database : a collection of data organized. It can be accessed, retrieved and used.

Data : a collection of raw unprocessed facts, figures, and symbols.

Information : data that is organized, meaningful, and useful

Database Management system(DBMS) : a program that allows users to manage database

Data Integrity

Data Integrity is a degree to which data is correct.

➢ Garbage in, Garbage out(GIGO) : the accuracy of a computer's output depends on the accuracy of the input.

Qualities of Valuable Information

- Accurate : correct information
- Verifiable : can prove the information is correct or incorrect
- Timely : age suited to its use
- Organized : arranged to suit your need and requirements
- Useful : has meaning to users who receives it
- Accessible : available when you need it
- Cost-effective : give more value than it costs to produce

Hierarchy of Data

- Character : number, letter, symbol
- Field : combination of one or more related characters
  - Field Name : uniquely identifies each field
  - Data Type : kind of data a field can contain
  - Field Size : maximum characters a field can contain
- Record : a group of related fields
- Key Field : a field that uniquely identifies each record in a file
- Data File : a collection of related records stored on a disk

Maintaining Data

File maintenance : the procedures that keep data current

1. Adding records

2. Modifying records

3. Deleting records

4. Validating data : the process of comparing data to a set of rules to find out if the data is correct.

   - Alphabet/Numeric check
   - Range check
   - Consistency check
   - Completeness check
   - Check digit

File processing VS Databases

- ***File Processing Systems :*** Each department within an organization has its own set of files.
- ***Database Approach :*** share the data in the database. It can reduce data redundancy and improve data integrity

Database Management System

1. Data Dictionary : contains data about each file in the database and each field within those files.
2. File Retrieval and Maintenance :
   - Query language
   - Query by example
   - Form
   - Report generator
3. Data security
   Access Privileges : define the activities that a specific user can perform, involve who can enter, change, remove data such as read-only function
4. Backup and Recovery

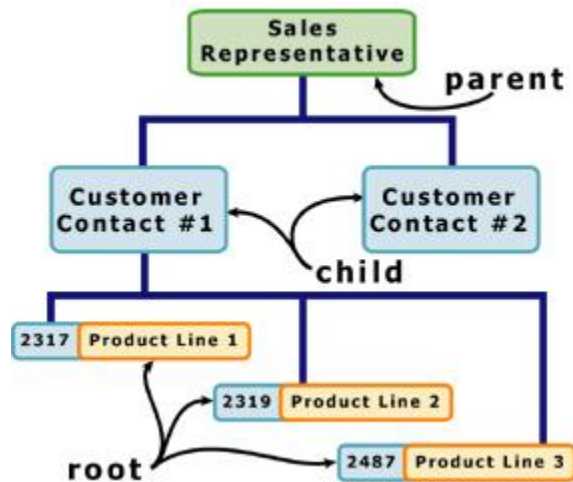# Data Model

1. Relational Database : store data in tables that consists of rows and columns

ROW	FIRST NAME	LAST NAME	AGE
#1	Bob	McBob	42
#2	John	Johnson	24
#3	Steve	Smith	38

RELATIONAL DATABASE

2. Object-Oriented Database(OODB) : store data in objects

OBJECT-ORIENTED DATABASE

3. Multidimensional Database(MDDB) : store data in dimensions
4. Data warehouse : a huge database system that stores and manages the data required to analyze historical and current transactions

Web Database

Web database allows users to shop for product and services, buy or sell stocks, search for a job, make airline reservations and many others.

Database Administration

Database Analyst(DA) : or Data Modeler, He decides on the proper data and identifies user's access privileges

Database Administrative(DBA) : creates and maintain the data dictionary, manage security of the database, and checks backup and recovery procedures

Chapter 11 : Manage Computing Securely, Safely, and Ethically

- ## *Computer Security Risks*

Computer security risk : action that could cause a loss to computer hardware, software, data, information.

Computer crime : illegal act involving a computer

Cyber crime : online illegal acts

        <u>such as</u> – Hacker
- Cracker
- Script kiddle
- Cyberextortortionist
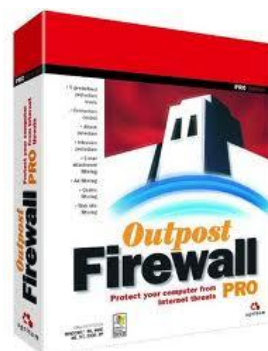- Cyberterrorist

- ## *Internet And Network Attacks*

Computer virus
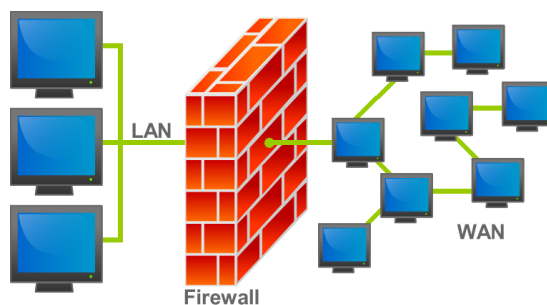
1. *Virus – alter the way the computer works*
2. *Worm – copies itself repeatedly*
3. *Trojan – looks like legitimate program*
4. *Rootkit – allows someone from a remote location to take full control*

Other computer attacks

- *Botnets*
- *Denial of service Attack(DOS)*

Safeguards against DoS Attacks

1. Firwall

FIREWALL

2. Intrusion Detection Software
3. Honeypot

- ## *Unauthorized Access and Use*

Unauthorized Access : *the use of a computer without permission*

Unauthorized Use : *the use of a computer for unapproved or possibly illegal activities*

Access control : *a security measure that defines who and when can access the computer and what actions they can take*

<u>*Such as*</u>

- *Username and Password*
- *Possessed object*
- *Biometric device*

- ## *Hardware Theft*

Hardware theft : *act of stealing computer equipment*

Hardware vandalism : *act of defacing or destroying computer equipment*

- ## *Software Theft*

Software theft : *illegal duplication of copyrighted software*

Safeguard >> Product Activation : *register with the software manufacturer*

- ## *Information Theft*

Information theft : *occurs when someone steals personal information*

Safeguard >> Encryption : *convert readable data into unreadable characters*

- ## *System Failure*

System failure : *malfunction of a computer which comes from many factors <u>such as</u> Noise, Undervoltages, Overvoltages*

Ways to protect : *1. Surge protectors*
2. Uninterruptable power supplies

- ## *Backing Up – The Ultimate Safeguard*

Back up : *a duplication of files, programs, or disk just in case when the original is lost.*

Two types of backups : *- Full backup*
- Selective backup

• Health Concerns of Computer Use

- Repetitive strain injury(RSI)
- Computer vision syndrome(CVS) ⟶ Solved by Ergonomic
- Computer addiction

REPETITIVE STRAIN INJURY

• Ethics and Society

Intellectual property rights : rights to which creators are entitled for their work

Code of conduct : guideline that identify which computer action is ethical or unethical

Green computing : reducing the electricity and environmental waste while using computer

Information privacy : rights to individuals to deny or restrict the collection and use of information about them

Cookie : a small text file that a web server stores on one's computer

Spam : an unsolicited e-mail message or newsgroup posting

Phishing : sending an official looking e-mail message that attempts to get your personal and financial information

Social engineering : obtaining unauthorized access or confidential information by taking advantage of trust and naivety

Chapter 14 : Enterprise Computing

- ## Enterprise Computing

Enterprise computing : *The use of computers in networks such as LAN and WAN*

Level of Users :

1. *Executive Management – top management*
2. *Middle Management – implementing decisions made by top management*
3. *Operational Management - Supervisors*
4. *Non- Management Employee – normal employees such as accountant and secretary*

Types of enterprise:

- Retail
- Manufacturing
- Service
- Wholesale
- Government
- Educational
- Transportation

Enterprise information : *The information collected in the ongoing operations of an enterprise-sized organization.*

- ## Information systems in the Enterprise

Information system : *a set of hardware, software, data, people, and procedures that work together to produce information*

Functional units :

1. *Human resource IS >> Employee relationship management(ERM)*
2. *Accounting and Finance >> Accounting software*
   >> Financial software
3. *Engineering or Product development >> Computer-Aided Design (CAD)*
   >> Computer-Aided Engineering (CAE)
4. *Manufacturing >> Computer-Aided Manufacturing (CAM)*
   >> Computer-Integrated Manufacturing (CIM)
   >> Material Requirement Planning (MRP)
   >> Material Requirement Planning II (MRP II)
5. *Marketing IS >> Marketing Research System(MRS)*
6. *Sales Force Automation(SFA)*
7. *Distribution System*
8. *Customer Interaction Management (CIM)*
9. *Information Technology >> Website Management Program*
   >> Security Software

General purpose information system :

1. *Office Information System(OIS) -* <u>such as</u> *letter, memo, fax*
2. *Transaction Processing System (TPS)-* <u>such as</u> *Bank, Point Of Sale*
3. *Management Information System(MIS)-* <u>such as</u> *create report for managers*
4. *Decision Support System(DSS)- analyze data and make decision* <u>such as</u> *charts*
5. *Expert System - store the knowledge of experts*
6. *Integrated Information Systems – combine various system in to one* <u>such as</u> *ERP, CRM, CMS*

• *Enterprise-Wide Technologies and Methodologies*

1. Portal
2. EDI
3. Data Warehouse
4. Extranet
5. Web Services
6. Document Management Systems(DMS)
7. Workflow
8. Virtual Private Networks(VPN)

• *Cloud Computing*

Cloud Computing : *an Internet service that provides computing needs to computer users*

<u>CLOUD COMPUTING</u>

• *E-commerce*

Type of E-commerce : **-** E-Retail
- Finance
- Travel
- Entertainment and Media
- Health

- ## *Enterprise Hardware*

1. RAID – duplicates data
2. Network Attached Storage(NAS) – server that provides storages for users in the network
3. Storage Area Network(SAN) – high speed network that provides storage to other severs
4. Enterprise storage system – consolidates storage
5. Blade server – packs a complete computer server on a single card, called blade, rather than a system unit. One blade is for one computer.

BLADE SERVER

6. Thin client – small terminal-like computer that relies on a server for data storage and processing such as use in airport check-in counter
7. High-availability systems – continue running and performing tasks for at least 99% of the time
8. Scalability – measure of how well a computer system can grow
9. Interoperability – share information with other information system within enterprise

- ## *Back up Procedure*

Type of back up :   >> Full
                         >> Differential
                         >> Incremental
                         >> Selective
                         >> Continuous

Disaster recovery plan :

1. Emergency Plan – actions to be taken immediately after the disaster occurs
2. Backup Plan – specifies how a firm uses backup files and equipment to resume information processing
3. Recovery Plan – specifies the actions to be taken to restore full information processing operations which differs for each type of disaster
4. Test Plan – to assure that the disaster plan is complete, it should be tested

Programming Concept

- ## *Program Design Techniques*

1. **Pseudo code** – *It is structured English used to represent an algorithm. There are two conventional rules 1) Statements are written in simple English.*
   2) Each statement is written on a separate line.
2. **Flowchart** – *It is a graphical diagram. There are six common symbols that are used.*

   1) Terminal symbol

   2) Input/Output symbol

   3) Process symbol

   4) Decision symbol

   5) Connector symbol

   6) Flowlines

- ## *Programming control structures*

1. **Sequence**
2. **Selection**
   - *IF*
   - *IF-ELSE*
   - *Nested IF*
3. **Iteration(Loop)**
   - *DOWHILE*
   - *REPEAT_UNTIL*

   Remember

   - Condition at the _____ of loop
   - Go around loop if the answer of condition is _____
   - Go around loop _____ times

DOWHILE	REPEAT_UNTIL
Beginning	End
Yes	No
0 or more	1 or more

Reference : http://www.bis.au.edu/index.php?topic=4222.0