SS1 Data Processing Lesson Note Second Term

WEEK 2 TOPIC: information processing

CONTENT

Information processing

Information processing is the acquisition, recording, organization, retrieval, display and dissemination of information.

Information processing could also be referred to as the manipulation of digitalized information by computers and other digital electronic equipment, known collectively as Information technology.

A computer information processor processes information to produce understandable results. For example, an information processor works to translate and format the digital information for printed form.

Collation of Information

Collation is the assembly of written information into a standard order. Many systems of collation are based on numerical order or alphabetical order, or extensions and combinations thereof. Collation is a fundamental element of most office filing systems, library catalogs, and reference books.

The main advantage of collation is that it makes it fast and easy for a user to find an element in the list, or to confirm that it is absent from the list. In automatic systems this can be done using a binary search algorithm or interpolation search; manual searching may be performed using a roughly similar procedure, though this will often be done unconsciously. Other advantages are that one can easily find the first or last elements on the list (most likely to be useful in the case of numerically sorted data), or elements in a given range (useful again in the case of numerical data, and also with alphabetically ordered data when one may be sure of only the first few letters of the sought item or items).

Information organization

Information organization (IO) is defined in this literature review as the process of ordering, surrogation, or description information and information objects. These three tasks have been identified by the author as broad tasks that both identify tangible elements of IO and have implications across areas of information research including retrieval, interaction, and personal information management.

Analysis of Information

Information analysis is the science of evaluating information content, and refining information to build portfolios. Information analysis works both for managers who use a non-quantitative process and for those who use a quantitative investment process. The only requirement is that there is a process./

Information is a fuzzy concept. Information analysis begins by transforming information into something concrete: investment portfolios. Then it analyzes the performance of those portfolios to determine the value of the information.

Information analysis can work with something as simple as an analyst's buy and sell recommendations. Or it can work with alpha forecasts for a broad universe of stocks. Information analysis is not concerned with the intuition or process used to generate stock recommendation only with the recommendations themselves.

Information Interpretation

Information interpretation is the process through which organizations make sense of new information that they have acquired and disseminated.

Items

- Our employees, as individuals, are prepared to rethink decisions when presented with new and relevant information. (0.65)
- Our employees seek to deeply understand issues and concepts. (0.46)
- Our employees do not hesitate to question things they do not understand. (0.65)
- Our employees, as individuals, are interested in knowing not only what to do but also why we do things. (0.78)

WEEK 3-4

TOPIC: Process of information transmission

CONTENT

Chart

A **chart**, also called a **graph**, is a graphical representation of data, in which "the data is represented by symbols, such as bars in a bar chart, lines in a line chart, or slices in a pie chart".[1] A chart can represent tabular numeric data, functions or some kinds of qualitative structure and provides different info.

The term "chart" as a graphical representation of data has multiple meanings:

- A data chart is a type of diagramor graph, that organizes and represents a set of numerical or qualitative data.
- Mapsthat are adorned with extra information (map surround) for a specific purpose are often known as charts, such as a nautical chart or aeronautical chart, typically spread over several map sheets.
- Other domain specific constructs are sometimes called charts, such as the chord chartin music notation or a record chart for album popularity.

Charts are often used to ease understanding of large quantities of data and the relationships between parts of the data. Charts can usually be read more quickly than the raw data that they are produced from. They are used in a wide variety of fields, and can be created by hand (often on graph paper) or by computer using a charting application. Certain types of charts are more useful for presenting a given data set than others. For example, data that presents percentages in different groups (such as "satisfied, not satisfied, unsure") are often displayed in a pie chart, but may be more easily understood when presented in a horizontal bar chart.[2] On the other hand, data that represents numbers that change over a period of time (such as "annual revenue from 1990 to 2000") might be best shown as a line chart.

Mobile Phone

Definition - What does Mobile Phone mean?

A mobile phone is a wireless handheld device that allows users to make calls and send text messages, among other features. The earliest generation of mobile phones could only make and receive calls. Today’s mobile phones, however, are packed with many additional features, such as Web browsers, games, cameras, video players and even navigational systems.

A mobile phone may also be known as a cellular phone or simply cellphone.

Mobile Phone

When the first mobile phones were introduced, their only function was to make calls, and they were so bulky it was impossible to carry them in a pocket.

Later, mobile phones belonging to the Global System for Mobile Communications (GSM) network were capable of sending and receiving text messages. As these devices evolved, they became smaller and more features were added, such as multimedia messaging service (MMS), which allowed users to send and receive images.

Most of these MMS-capable devices were naturally equipped with cameras, which allowed users to capture photos with the built-in camera, add captions, and send them to friends and relatives who also had MMS-capable phones.

A mobile phone with highly advanced features is called a smartphone, while a regular mobile phone is known as a feature phone.

A mobile phone typically operates on a cellular network, which is composed of cell sites scattered throughout cities, countrysides, and even mountainous regions. If a user happens to be located in an area where there is no signal from any cell site belonging to the cellular network provider he or she is subscribed to, calls cannot be placed or received in that locati**on.**

NEWSPAPER

a publication issued at regular and usually close intervals, especially daily or weekly, and commonly containing news, comment, features, and advertising.

Radio

The Alexandra Palace, here: mast of the broadcasting station

Classic radio receiver dial

Radio is the radiation (wireless transmission) of electromagnetic energy through space.[n 1] The biggest use of radio waves is to carry information, such as sound, by systematically changing (modulating) some property of the radiated waves, such as their amplitude, frequency, phase, or pulse width. When radio waves strike an electrical conductor, the oscillating fields induce an alternating current in the conductor. The information in the waves can be extracted and transformed back into its original form.

Radio systems need a transmitter to modulate (change) some property of the energy produced to impress a signal on it, for example using amplitude modulation or angle modulation (which can be frequency modulation or phase modulation). Radio systems

also need an antenna to convert electric currents into radio waves, and vice versa. An antenna can be used for both transmitting and receiving. The electrical resonance of tuned circuits in radios allow individual stations to be selected. The electromagnetic wave is intercepted by a tuned receiving antenna. A radio receiver receives its input from an antenna and converts it into a form usable for the consumer, such as sound, pictures, digital data, measurement values, navigational positions, etc.[2] Radio frequencies occupy the range from a 3 kHz to 300 GHz, although commercially important uses of radio use only a small part of this spectrum.[3]

A radio communication system sends signals by radio.[4] The radio equipment involved in communication systems includes a transmitter and a receiver, each having an antenna and appropriate terminal equipment such as a microphone at the transmitter and a loudspeaker at the receiver in the case of a voice-communication system.[5]

Telephone

A rotary dial telephone, c.1940s

Modern telephones use push buttons

A **telephone**, or **phone**, is a telecommunications device that permits two or more users to conduct a conversation when they are too far apart to be heard directly. A telephone converts sound, typically and most efficiently the human voice, into electronic signals suitable for transmission via cables or other transmission media over long distances, and replays such signals simultaneously in audible form to its user.

In 1876, Scottish emigrant Alexander Graham Bell was the first to be granted a United States patent for a device that produced clearly intelligible replication of the human voice. This instrument was further developed by many others. The telephone was the first device in history that enabled people to talk directly with each other across large distances. Telephones rapidly became indispensable to businesses, government, and households, and are today some of the most widely used small appliances.

The essential elements of a telephone are a microphone (*transmitter*) to speak into and an earphone (*receiver*) which reproduces the voice in a distant location. In addition, most telephones contain a *ringer* which produces a sound to announce an incoming telephone call, and a dial or keypad used to enter a telephone number when initiating a call to another telephone. Until approximately the 1970s most telephones used a rotary dial, which was superseded by the modern DTMF push-button dial, first introduced to the public by AT&T in 1963.[1] The receiver and transmitter are usually built into a handset which is held up to the ear and mouth during conversation. The

dial may be located either on the handset, or on a base unit to which the handset is connected. The transmitter converts the sound waves to electrical signals which are sent through the telephone network to the receiving phone. The receiving telephone converts the signals into audible sound in the receiver, or sometimes a loudspeaker. Telephones permit duplex communication, meaning they allow the people on both ends to talk simultaneously.

Television

Flat-screen televisions for sale at a consumer electronics store

A **television**, commonly referred to as **TV**, **telly** or the **tube**, is a telecommunication medium used for transmitting sound with moving images in monochrome (black-and-white), or in colour, and in two or three dimensions. It can refer to a television set, a television program, or the medium of television transmission. Television is a mass medium, for entertainment, education, news and advertising.

Television signals were initially distributed only as terrestrial television using high-powered radio-frequency transmitters to broadcast the signal to individual television receivers. Alternatively television signals are distributed by co-axial cable or optical fibre, satellite systems and via the Internet.

Types of information transmission

Wireless

A handheld On-board communication station of the maritime mobile service

Wireless communication is the transfer of information between two or more points that are not connected by an electrical conductor.

The most common wireless technologies use radio. With radio waves distances can be short, such as a few meters for television or as far as thousands or even millions of kilometers for deep-space radio communications. It encompasses various types of fixed, mobile, and portable applications, including two-way radios, cellular telephones, personal digital assistants (PDAs), and wireless networking. Other examples of applications of radio *wireless technology* include GPS units, garage door openers, wireless computer mice, keyboards and headsets, headphones, radio receivers, satellite television, broadcast television and cordless telephones.

Somewhat less common methods of achieving wireless communications include the use of other electromagnetic wireless technologies, such as light, magnetic, or electric fields or the use of sound.

Communications satellite

An Advanced Extremely High Frequency communications satellite relays secure communications for the United States and other allied countries.

A **communications satellite** is an artificial satellite that relays and amplifies radio telecommunications signals via a transponder; it creates a communication channel between a source transmitter and a receiver(s) at different locations on Earth. Communications satellites are used for television, telephone, radio, internet, and military applications. There are over 2,000 communications satellites in Earth's orbit, used by both private and government organizations.[1]

Wireless communication uses electromagnetic waves to carry signals. These waves require line-of-sight, and are thus obstructed by the curvature of the Earth. The purpose of communications satellites is to relay the signal around the curve of the Earth allowing communication between widely separated points.[2] The electromagnetic signals that communication satellites work with, have a large spectrum of wavelengths and frequencies.

CABLE

Cable communicaTION rerfer to the transmission of data over a wired-based communication technilogy . Examples include telepoine network,cable television or internet accesss and fibre – optic communication.

RECEIVER

The receiver in information theory is the receiving end of a communication channel. It receives messages / information from a sender, who first encoded them. Sometimes the receiver is modeled so as to include the decoder.

WEEK 5

TOPIC: Means of transmitting information

CONTENT

MEANS OF TRANSMITTING INFORMATION

Electronic transmission

- "Electronictransmission" means any process of communication that does not directly involve the physical transfer of paper and that is suitable for the retention, retrieval and reproduction of information by the recipient.it is also referred to as the use of electronic media for transmitting information e.g. Radio waves

Non electronic transmission

Information has been sent via non-electronic means since the advent of communication eg. Optical, acoustic, and mechanical.

These include newspaper, and charts

WEEK 6

TOPIC: Computer Ethics

CONTENT

Computer Lab Rules and Ethics – Concept Outline

1. You will do much in the labs during your years at Challenger. In order that that those years be productive

    - You will learn the rules of conduct expected for the lab.
    - You will know what the consequences of misbehavior are.
    - You will learn about the ethics of software usage.
    - You will learn to use the Internet safely.

1. Put all books and personal items on the shelves by the door when you come in the lab.

- There's not enough room at the computers for any personal material except your paper and pencil.

III. You must be working on *your* project at all times. You are not allowed to be in here to "play" on the computers, there is work to be done.

Students may not

- Change the desktop in any way.
- Change the screensaver.
- Delete, move, or rename any files.
- Install any software downloaded from the Internet or any other source.
- Open personal e-mail accounts.
- Install or open chat programs such as Instant Messenger.
- Use computer games such as Solitaire, Minesweeper, etc. without permission from the teacher.

While it is possible to have fun, if you are caught not working on the the assignment, it will be considered **computer misuse**.

1. There is no food, drink, or candy allowed in the lab please enter the lab with clean hands.

Treat the computer with respect:

Hands off the monitor

Gentle use of the keyboard and mouse (Leave it on the pad, please)

Take care when handling media.

1. Use good posture while sitting at the computer (eyes level with the monitor, shoulders down, arms relaxed, feet flat on the floor, back supported).

1. Obey all regular classroom rules. Policies & Procedures of your regular classroom teacher are in effect here just like the classroom. Do your own work; don't disturb your neighbors.

VII. What happens when the rules are broken?

- 1st offense:
  Student is removed from computer for the remainder of class period and will write an explanation of misconduct or misuse. Student will be responsible for repair or replacement.
- 2nd offense:

Student is sent to In-House Suspension for remainder of class period. It is up to the classroom teacher's discretion if the student can make up missed work. Student will be responsible for repair or replacement.

- 3rd offense:

Student has no more computer lab privileges. Student will be responsible for repair or replacement.

VIII. Etiquette means manners: be polite, have respect for other's property just like they should have for yours. Be honest--do your own work.

1. Copyright Laws

- Fair use clause for education.
- Difference between classroom use and published work.
- Copying software.
- Citing electronic sources.

1. Hacking: unauthorized use of school computer hardware or software.

Huntsville City Schools Discipline Policy –

Class 2 Offense: without causing damage

Class 3 Offense: causing damage

1. Internet Safety

- Never reveal personal information (name, address, age, phone number)
- Never give anyone your Social Security number, credit card numbers, your parents' name(s)
- Never arrange to meet someone face-to-face you have met on-line
- Don't share photos of yourself with someone you only know on-line

- Don’t share passwords with anyone except your parents and teachers

WEEK 7

TOPIC: Computer safety measures

CONTENT

Computer Safety Measures

- Anti-virus software is your computer's best defense against malware (e.g., viruses, Trojan horses, worms, spyware) – install and update anti-virus software on your computer and regularly scan your computer to make sure it is free from malware
- Download the latest system and application updates for your computer, which may include important security patches
- Make sure that the security tools on your computer are up to date, and select the automatic update option if possible
- Do not access the Internet without first enabling an updated firewall, especially when using DSL or a cable modem
- If your security software has identified malware on your computer, you need to remove it and then change your Online Banking password
- Avoid clicking attachments or links in unsolicited email messages, doing so could lead to the0020installation of malware on to your computer
- For your security, always type the Internet address (e.g., www.key.com) directly into your browser
- Always sign out and close your browser after using a secure website
- When your computer is not in use, consider shutting it down or disconnecting it from the Internet

WEEK 8

TOPIC: Operating System

CONTENT

Operating system

Operating systems

Common features

· Process management

· Interrupts

· Memory management

· File system

· Device drivers

· Networking

· Security

· I / O

•

An **operating system** (**OS**) is system software that manages computer hardware and software resources and provides common services for computer programs. The operating system is a component of the system software in a computer system. Application programs usually require an operating system to function.

Time-sharing operating systems schedule tasks for efficient use of the system and may also include accounting software for cost allocation of processor time, mass storage, printing, and other resources.

For hardware functions such as input and output and memory allocation, the operating system acts as an intermediary between programs and the computer hardware,[1][2] although the application code is usually executed directly by the hardware and frequently makes system calls to an OS function or is interrupted by it. Operating systems are found on many devices that contain a computer—from cellular phones and video game consoles to web servers and supercomputers.

Examples of modern operating systems include Apple OS X, Linux and its variants, and Microsoft Windows.

Types of operating systems

Single- and multi-tasking

A single-tasking system can only run one program at a time, while a multi-tasking operating system allows more than one program to be running in concurrency. This is achieved by time-sharing, dividing the available processor time between multiple processes which are each interrupted repeatedly in time-slices by a task scheduling subsystem of the operating system. Multi-tasking may be characterized in preemptive and co-operative types. In preemptive multitasking, the operating system slices the CPU time and dedicates a slot to each of the programs. Unix-like operating systems, e.g., Solaris, Linux, as well as AmigaOS support preemptive multitasking. Cooperative multitasking is achieved by relying on each process to provide time to

the other processes in a defined manner. 16-bit versions of Microsoft Windows used cooperative multi-tasking. 32-bit versions of both Windows NT and Win9x, used preemptive multi-tasking.

Single- and multi-user

Single-user operating systems have no facilities to distinguish users, but may allow multiple programs to run in tandem.[3] A multi-user operating system extends the basic concept of multi-tasking with facilities that identify processes and resources, such as disk space, belonging to multiple users, and the system permits multiple users to interact with the system at the same time. Time-sharing operating systems schedule tasks for efficient use of the system and may also include accounting software for cost allocation of processor time, mass storage, printing, and other resources to multiple users.

Distributed

A distributed operating system manages a group of distinct computers and makes them appear to be a single computer. The development of networked computers that could be linked and communicate with each other gave rise to distributed computing. Distributed computations are carried out on more than one machine. When computers in a group work in cooperation, they form a distributed system.[4]

Templated

In an OS, distributed and cloud computing context, templating refers to creating a single virtual machine image as a guest operating system, then saving it as a tool for multiple running virtual machines. The technique is used both in virtualization and cloud computing management, and is common in large server warehouses.[5]

Embedded

Embedded operating systems are designed to be used in embedded computer systems. They are designed to operate on small machines like PDAs with less autonomy. They are able to operate with a limited number of resources. They are very compact and extremely efficient by design. Windows CE and Minix 3 are some examples of embedded operating systems.

Real-time

A real-time operating system is an operating system that guarantees to process events or data within a certain short amount of time. A real-time operating system may be single- or multi-tasking, but when multitasking, it uses specialized scheduling algorithms so that a deterministic nature of behavior is achieved. An event-driven system switches between tasks based on their priorities or external events while time-sharing operating systems switch tasks based on clock interrupts.[*citation needed*]

Library

A library operating system is one in which the services that a typical operating system provides, such as networking, are provided in the form of libraries. These libraries are composed with the application and configuration code to construct unikernels — which are specialised, single address space, machine images that can be deployed to cloud or embedded environments.

WEEK 9

TOPIC: Examples of Operating System

CONTENT

Definition: An **operating system** is a collection of programs that control the application software that users run and provides a link between the hardware and software currently running on the computer. The operating system is also responsible for the management and control of all resources (memory, hard drives, monitor, etc.) that are shared amongst the different application programs that may be running simultaneously.

Examples of common personal computer operating systems:

- Windows 7
- Windows Vista
- Windows Server 2003
- Linux
- Mac OS X
- SunOS

Alternate Spellings: OS, O/S, kernel

Examples: Google announced that they are developing a new **operating system** that users will be able to use to run on their PCs.

WEEK 10

TOPIC: Functions of Operating System

CONTENT

Basic functions of an operating system

Definition

An operating system is a group of computer programs that coordinates all the activities among computer hardware devices. It is the first program loaded into the computer by a boot program and remains in memory at all times.

Functions of an operating system

The basic functions of an operating system are:

1. Booting the computer
2. Performs basic computer tasks eg managing the various peripheral devices eg mouse, keyboard

- Provides a user interface, e.g. command line, graphical user interface (GUI)

1. Handles system resources such as computer's memory and sharing of the central processing unit (CPU) time by various applications or peripheral devices
2. Provides file management which refers to the way that the operating system manipulates, stores, retrieves and saves data.

Booting the computer

The process of starting or restarting the computer is known as booting. A cold boot is when you turn on a computer that has been turned off completely. A warm boot is the process of using the operating system to restart the computer.

Performs basic computer tasks

The operating system performs basic computer tasks, such as managing the various peripheral devices such as the mouse, keyboard and printers. For example, most operating systems now are plug and play which means a device such as a printer will automatically be detected and configured without any user intervention.

Provides a user interface

A user interacts with software through the user interface. The two main types of user interfaces are: command line and a graphical user interface (GUI). With a command line interface, the user interacts with the operating system by typing commands to perform specific tasks. An example of a command line interface is DOS (disk operating system). With a graphical user interface, the user interacts with the operating system by using a mouse to access windows, icons, and menus. An example of a graphical user interface is Windows Vista or Windows 7.
The operating system is responsible for providing a consistent application program interface (API) which is important as it allows a software developer to write an application on one computer and know that it will run on another computer of the same type even if the amount of memory or amount of storage is different on the two machines.

Handles system resources

The operating system also handles system resources such as the computer's memory and sharing of the central processing unit (CPU) time by various applications or peripheral devices. Programs and input methods are constantly competing for the attention of the CPU and demand memory, storage and input/output bandwidth. The operating system ensures that each application gets the necessary resources it needs in order to maximise the functionality of the overall system.

Provides file management

The operating system also handles the organisation and tracking of files and directories (folders) saved or retrieved from a computer disk. The file management system allows the user to perform such tasks as creating files and directories, renaming files, coping and moving files, and deleting files. The operating system keeps track of where files are located on the hard drive through the type of file system. The type two main types of file system are File Allocation table (FAT) or New Technology File system (NTFS).

Types of file system

- File Allocation table (FAT)
- New Technology file system (NTFS)

File Allocation table (FAT) uses the file allocation table which records, which clusters are used and unused and where files are located within the clusters.

NTFS is a file system introduced by Microsoft and it has a number of advantages over the previous file system, named FAT32 (File Allocation Table).

One major advantage of NTFS is that it includes features to improve reliablity. For example, the new technology file system includes fault tolerance, which automatically repairs hard drive errors without displaying error messages. It also keeps detailed transaction logs, which tracks hard drive errors. This can help prevent hard disk failures and makes it possible to recover files if the hard drive does fail.

NTFS also allows permissions (such as read, write, and execute) to be set for individual directories and files.