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Modeling and Simulation

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Lecture Content

- **System Variables and Parameters**
- **Information System**
- **Feedback, Forecasting**

Lecture Content

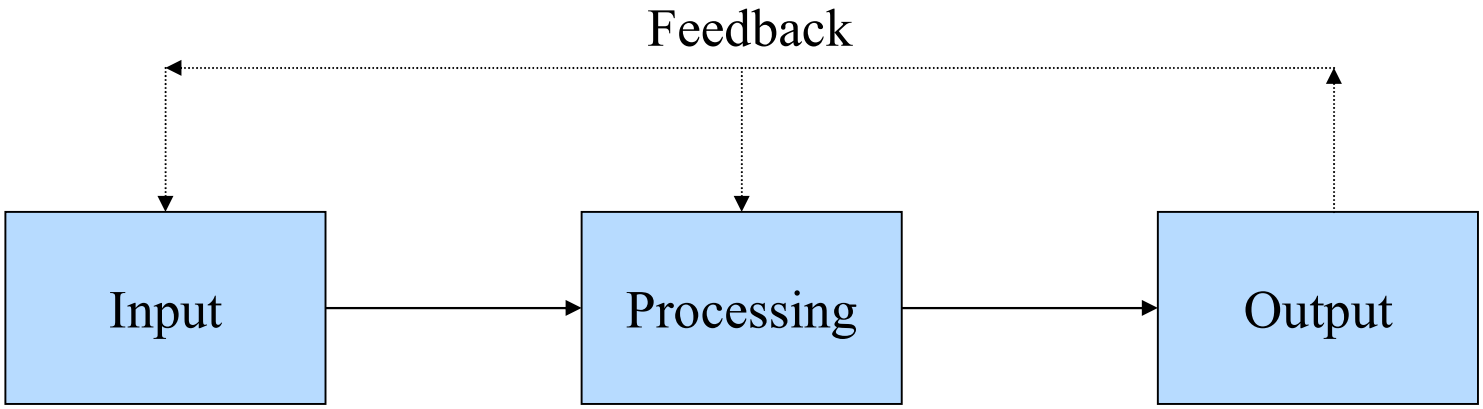
- **Manual vs. Computerized Systems**
- **Computer Based Information System**
- **Factors affecting the performance of computing system**

System Variables and Parameters

- System variable
  - A quantity or item that can be controlled by the decision maker
  - E.g. the price a company charges for a product
- System parameter
  - A value or quantity that cannot be controlled by the decision maker
  - E.g., cost of a raw material

What is an Information System?

- **Schematic model of an information system**



Input, Processing, Output,

- **Input**
  - **The activity of gathering and capturing data**
  - **Whatever goes into the computer**
- **Processing**
  - **Converting or transforming data into useful outputs**
- **Output**
  - **Useful information, usually in the form of documents and/or reports**
  - **Anything that comes out of a computer**

Input ‘Discussion’

- **Whatever goes into the computer. Input can take a variety of forms, from commands you enter on a keyboard to data from another computer or device. A device that feeds data into a computer, such as a keyboard or mouse, is called an input device.**
- **The act of entering data into a computer**

Output ‘Discussion’

Anything that comes out of a computer. Output can be meaningful information or gibberish, and it can appear in a variety of forms -- as binary numbers, as characters, as pictures, and as printed pages. Output devices include display screens, loudspeakers, and printers.

To give out. For example, display screens output images, printers output print, and loudspeakers output sounds.

Feedback

- **Feedback**
  - **Output that is used to make changes to input or processing activities**
- **Forecasting**
  - **A proactive approach to feedback**
  - **Use for estimating future sales or inventory needs**

Manual vs. Computerized Systems

- **Manual systems still widely used**
  - **E.g., some investment analysts manual draw charts and trend lines to assist them in making investment decisions Computerized systems**
  - **E.g., the above trends lines can be drawn by computer**

Manual vs. Computerized Systems

- **Computerized systems**
  - **E.g., the above trends lines can be drawn by computer**
- **Evolution**
  - **Many computerized system began as manual systems**
  - **E.g., Student affairs, Post Office**

Computer-based Information Systems (CBIS)

- **A CBIS is composed of…**
  - **Hardware**
  - **Software**
  - **Databases**
  - **Telecommunications**
  - **People**
  - **Procedures**

Computer-based Information Systems (CBIS)

- **Together they are…**
  - **Configured to collect, manipulate, store, and process data into information**

Technology Infrastructure

- **Another term for CBIS**
- **Consists of the shared information system (IS) resources that form the foundation of the information system**

Parts of a CBIS

- Five parts
  - Hardware
  - Software
  - Database
  - Telecommunications
  - Networks

Parts of a CBIS

- Five parts
  - Hardware
  - Software
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Hardware

- **Hardware**
  - **The computing system used to perform input, processing, and output activities**
  - **The objects that you can actually touch, like disks, disk drives, display screens, keyboards, printers, boards, and chips.**

Factors affecting the performance of computing system

1. CPU Clock speed:-

The computer clock speed governs how fast the CPU will run

The processor consists of:

ALU + control unit

Factors affecting the performance of computing system

- **The higher the speed of computer processor the faster the computer will work.**
- **The clock speed is given in Gigahertz (GHz).**

Factors affecting the performance of computing system

2. RAM Size:-

As a rule the more memory you have the faster the PC will appear to operate.

Factors affecting the performance of computing system

3. Hard disk speed and storage :-

Hard disks are measured by their speed, defined by the disk access time, which is measured in milliseconds.

The smaller this access time the faster the hard disk will store or retrieve data.

Factors affecting the performance of computing system

4. Free Hard disk space:-

- **To get the most out of your Windows based PC, you not only need a fast hard disk but also a large hard disk .**
- **This is due to the fact Windows is constantly moving data between the hard disk and RAM (Random Access Memory).**

Factors affecting the performance of computing system

- **Microsoft Windows will create many so-called “temporary files” which it uses for managing your programs.**
- **In fact, if you have very little free hard disk space you may find that Microsoft Windows will not be able to run your programs at all.**

Factors affecting the performance of computing system

5. De-fragmenting Files:-

- **When you use a PC, over a period of time the files get broken up into separate pieces which are spread all over the hard disk. De-fragmentation means taking all the broken up pieces and joining them back together again.**

Factors affecting the performance of computing system

5. De-fragmenting Files:-

- **If you are running Windows you may find that if you click on the Start menu, select Programs, and then select the Accessories / System tools group, there is a de-fragmentation program. Running this periodically will speed up the operation of your PC.**

Factors affecting the performance of computing system

6. Multitasking considerations :-

- **Windows is a multitasking system, which means that it can run more than one program at a time. However the more programs which are running at the same time, the slower each one will run. To some extent this slowing effect depends on what each program is doing.**

Questions

Q1: What is the difference between Manual & Computer Based Information systems?

Questions

Q2: if you have _____free hard disk space you may find that Microsoft Windows will not be able to run the system programs at all.

a) many

b) very little

c) so much

d) little

Questions

Q3: The smaller hard disk_____ time the faster the hard disk will store or retrieve data.

a) processing

b) manipulation

c) realization

d) access

Questions

Q4: Microsoft Windows will create many so-called "temporary files" which it uses for _____your programs.

a) processing

b) manipulating

c) realizing

d) managing

Questions

Q5: Running _____ periodically will speed up the operation of CBIS .

a) Many Programs

b) databases

c) de-fragmentation

d) Big data

Questions

Q6:The information system consists of _____ information system resources that form the foundation of the information system

a) accessed

b) database

c) network

d) shared

Questions

Q7:The speed of computer devices used in information systems is measured in _____

a) Mbytes

b) Gbytes

c) GHz

d) Mbit/s

Questions

Q8: The higher the speed of computer processor the faster the computing system _____.

a) bytes

b) bits

c) performance

d) Mbytes

Questions

Q9: Hard disks are measured by their _____.

a) speed

b) weight

c) length

d) width

Questions

Q10: Many CBIS system began as manual systems.

a) True

b) False