Computer Applications in Management

MGMT 1091

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Outline

- Defining Computer
- ICT and its Benefits
- Data Vs Information
- Characteristics of computers
- Application area of computers

What is a Computer? (1)

- A computer is a fast electronic device that processes the input data according to the instructions given by the programmer/user and provides the desired information as an output.
- A computer is a machine that can receive, store, and process data to provide information.

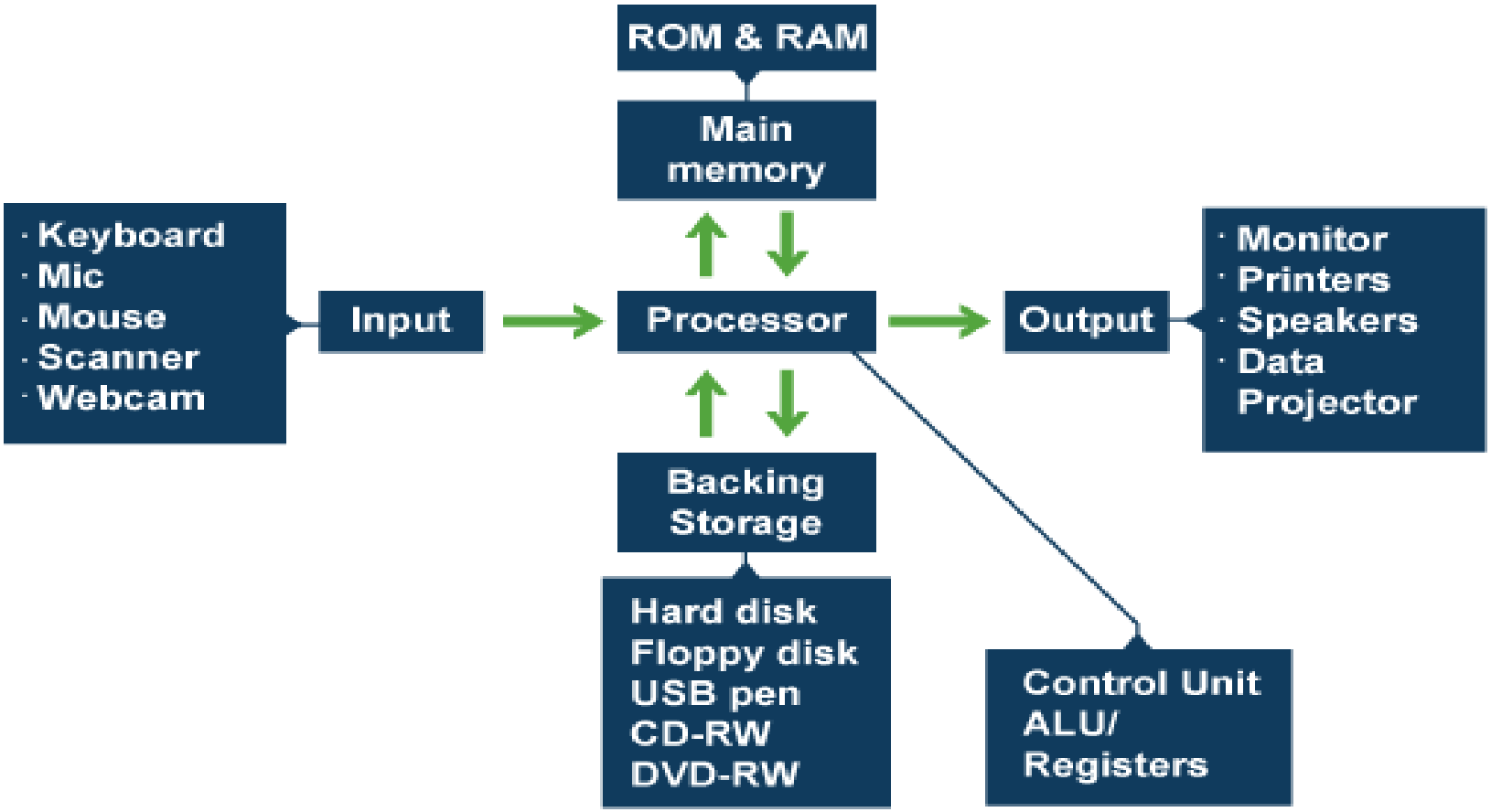
What is a Computer? (2)

- It is a set of interrelated and interconnected devices which accept raw data, process it, store and produce the result by following pre-determined instructions or a program.
- Therefore, we may define *computer as a device that transforms data* to Information. Data can be anything like marks obtained by you in various subjects. It can also be name, age, sex, weight, height, etc. of all the students in your class or income, savings, investments, etc., of a country.
- Computer can be defined in terms of its functions. It can
  1. Accept data
  2. Store data
  3. Process data
  4. Display the information.
- **Accepts input, processes data, stores data, and produces output**

How a Computer Works? (1)

- Computers accept inputs (data)
- The input is translated into binary numbers (0 & 1) and 'processed' by a processor(CPU)
- Data is stored in the storage device of a computer.
- The process produces output (information)
- This sequence can repeat endlessly: outputs can be inputs!

How a Computer Works? (2)



Input

Input can take a variety of forms, from commands **you** enter from the keyboard to data from another computer or device.

The act of entering data into a computer.

The user initiates the action by doing something:

- Clicking the mouse
- Typing on the keyboard
- Touching the touch screen

This is input

A device that feeds data into a computer, such as a keyboard or mouse, is called an **input** device.

Processing

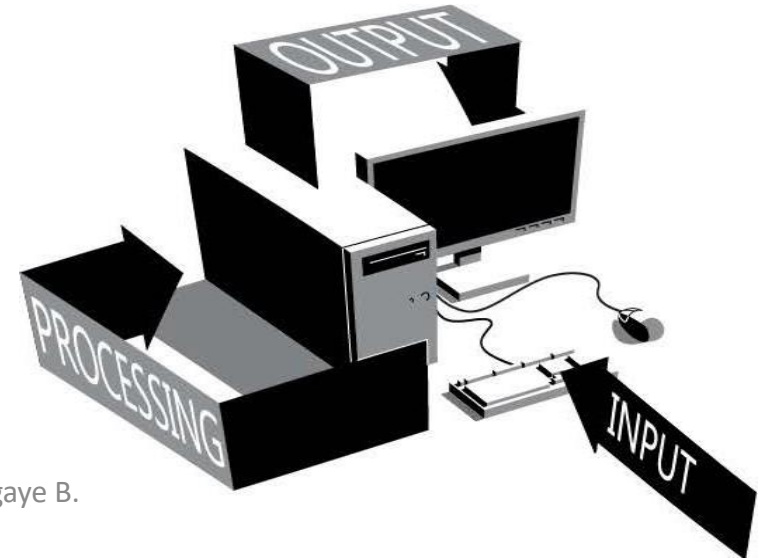
- The process of transforming input data into and output (Information).
- The CPU handles the majority of the processing tasks and is the "brain" of the computer
- The computer processes input and produces output.
- Without processing, the computer’s output would be the same as its input

Storage

- *store* is the action of saving information for later use.
- In *computers*, that may be to a *storage* device, such as an internal hard drive, optical disc drive, or an external *storage* device
- The OS (operating system) of the *computer* is responsible for storing data on your *computer*.

Output

- The visual, auditory, or tactile perceptions provided by the computer after processing the provided information
- Once the computer has processed the request, it shows you the result by changing what you see on the monitor or playing a sound through the speakers
- This is output



Characteristics of Computers (1)

- Computers are capable of performing highly complex tasks which human beings cannot perform efficiently.
- The following are the main characteristics of computers, which make them so powerful and Unique than human being.
  - Speed
  - Accuracy
  - Diligence
  - Versatility
  - Storage Capacity, etc…

Characteristics of Computers (2)

- **Speed:** A computer is so fast that it can perform the given task (arithmetical or logical) in few seconds as compared to human who can spend many hours for doing the same task. A computer can process millions of instructions per second.
- **Accuracy:** While doing calculations, a computer is more accurate than man. Man can make mistakes in calculations but a computer does not make mistakes, if it is provided accurate instructions.
- **Diligence:** A computer does not suffer from the human traits of tiredness. Man will be tired and bored while doing millions of calculations but a computer, being a machine, does this job very efficiently and without any tiredness and boredom.

Characteristics of Computers (3)

- **Storage Capacity**: A computer has much more memory or storage capacity than human brain. It can store millions of data and instructions, which can be retrieved and recalled even after a number of years. This is not possible in case of human brain.
- **Versatility**: A computer can perform *various types of jobs*. On a computer system, we can listen to songs while typing text or play games while working on any other package, do calculations, make drawings, surf the net, send e-mail, etc.

Characteristics of Computers (4)

- **Reduction in Manpower:** Earlier, the work in industries/factories was done by a number of persons. But with computers, it can be completed by a few persons and that too more accurately and efficiently. The advent of computer has reduced the need of manpower.
- **Paper Work can be Reduced:** The use of computer reduces the burden of paper work in any organization. *For example*, record of each student of a school can be kept in the computer itself rather than keeping manual files for each student. Also, information regarding any student can be obtained easily and quickly with the help of a computer.

Limitations of a Computer(1)

Despite having various advantages, computers do have the following limitations that are the strengths of human beings. These are:

- **No Intelligence:** A computer is a machine and obviously has no intelligence of its own. Each and every instruction must be given to the computer for doing a task. Man has an intelligence and it is the man who invented computer and gives it all the instructions and logic to work.
- A computer cannot take decisions on its own and it is the main drawback of computer.
- Computers do not have intelligence of their own, they work according to the instructions given by humans.

Limitations of a Computer(2)

- **No Decision-making Ability**: Computers cannot take any decisions. Human beings assist the computer to take the decisions.
- *For example*, suppose a street Man is selling flowers. If such kind of flowers are already in our house, we will decide not to purchase them. Taking decision in this way, without the assistance of human beings, is not possible by a computer.

Limitations of a Computer(3)

- **No Emotions and Feelings:** Computers are far away from emotions and certainly being machines, they cannot have feelings and instincts.
- These limitations of computers are characteristics of human beings. Thus, computers and human beings work in collaboration to make a perfect pair.

INFORMTION COMMUNICATION TECHNOLOGY (ICT) (3)

- ICT refers to technology that provides access to information through telecommunications.
- ICT refers to technologies and systems supporting the
  - Collection
  - Processing
  - Dissemination
  - Access, and
  - prevention of data or information that may be transmitted electronically.

INFORMATION COMMUNICATION TECHNOLOGY (ICT) (4)

- ICT focuses primarily on technologies Such as the
  - Internet
  - wireless networks
  - cell phones
  - telephones
  - TV
  - Radio and other communication media etc

INFORMATION COMMUNICATION TECHNOLOGY (ICT) (4)

- ICT used to enhance communication between
  - employers and employees
  - businesses and customers
  - business and business across physical boundaries, etc.
- ICT has become a major factor in social and economic development of the society.
- ICT has frequently been thought to be the driving force behind today's economy.
- It is generally felt that there is a direct relationship between investment in ICT and productivity improvements.

INFORMATION COMMUNICATION TECHNOLOGY (ICT) (6)

- The term ICT has gained popularity due to the convergence of
  - Information Technology (IT)
  - Telecommunication Technology (CT)
- A good way to think about ICT is to consider all the uses of digital technology that already exist to help individuals, businesses and organizations to use information.

Benefits of ICTs (1)

- Employment opportunities
- Data and information gathering and distribution
- Better customer service
- Greater product variety
- Shorter response time
- Enhanced product quality
- Better customization of products and services…

Benefits of ICTs (2)

- Efficient communications for manufacturing, service and tourism sector.
- Fast response to natural disasters and effective rural health and family planning services.
- Effective governance and administrative effectiveness.
- education, research and communication of research results.
- Access to global market and research information.

Data Vs Information(1)

Data

- **Data** are raw facts about the organization and its business transactions. Most data items have little meaning and use by themselves.
- **Data** are plain facts. When data are processed, organized, structured or presented in a given context so as to make them useful, they are called **Information.**
- **Data** in themselves are fairly useless. But when these data are *interpreted* and processed to determine its true *meaning*, they become useful and can be called **Information**. Data is computer's language. Information is our translation of this language.

Information

- Information is data that has been refined and organized by processing and purposeful intelligence.
- Information is data processed for some purpose
- Information is any form of communication that provides understandable and useful knowledge for the person receiving it
- Information can only be considered to be 'real' Info if it meets certain criteria i.e.
  - it must be communicated to the recipient
  - it must be in a language that is understood
  - it must be in a suitable form
  - it must be relevant for achieving some purpose

Data Vs Information

Data

- raw facts
- no context
- just numbers and text

Information

- data with context
- processed data
- value-added to data
  - summarized
  - organized
  - analyzed

Example for Data vs. Information

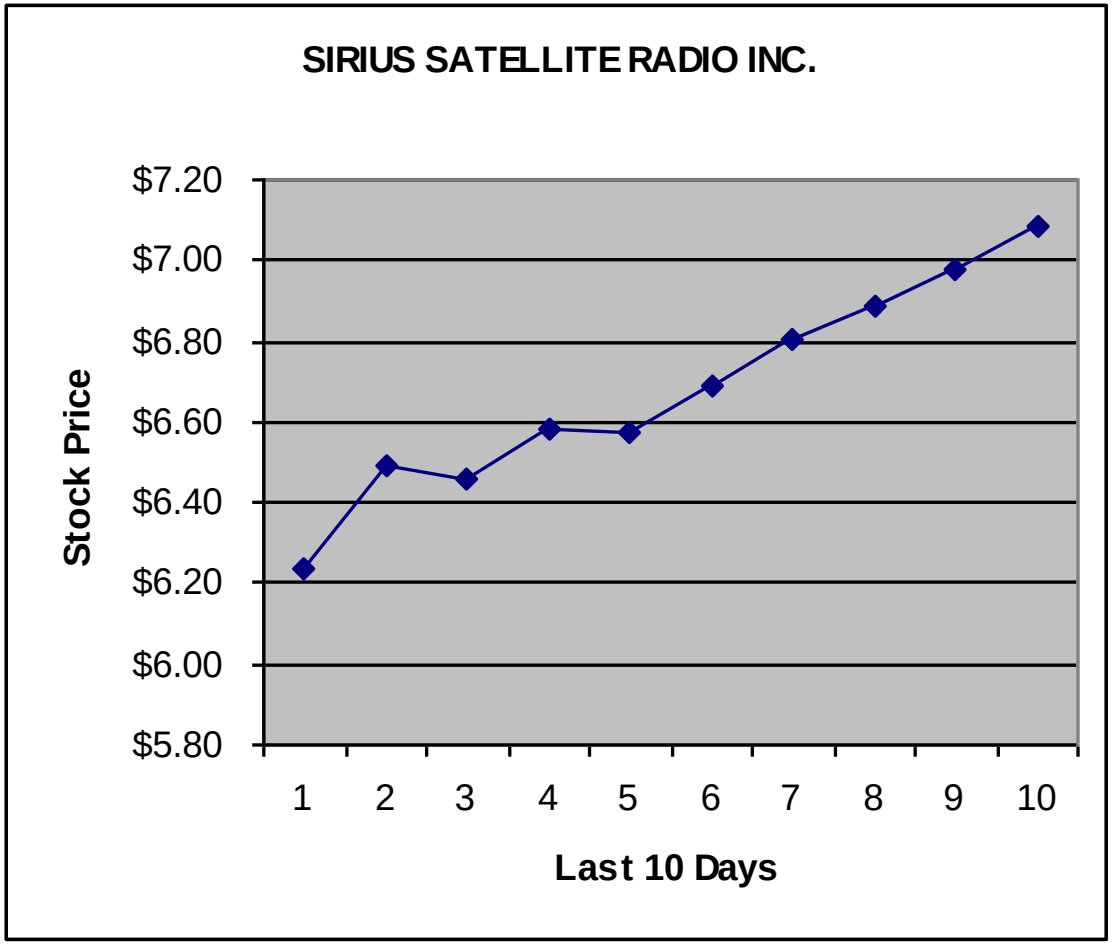
- Data: 51007
- Information:
  - 5/10/07 The date of your final exam.
  - $51,007 The average starting salary of an accounting major.
  - 51007 Zip code of Bronson Iowa.

Data vs. Information

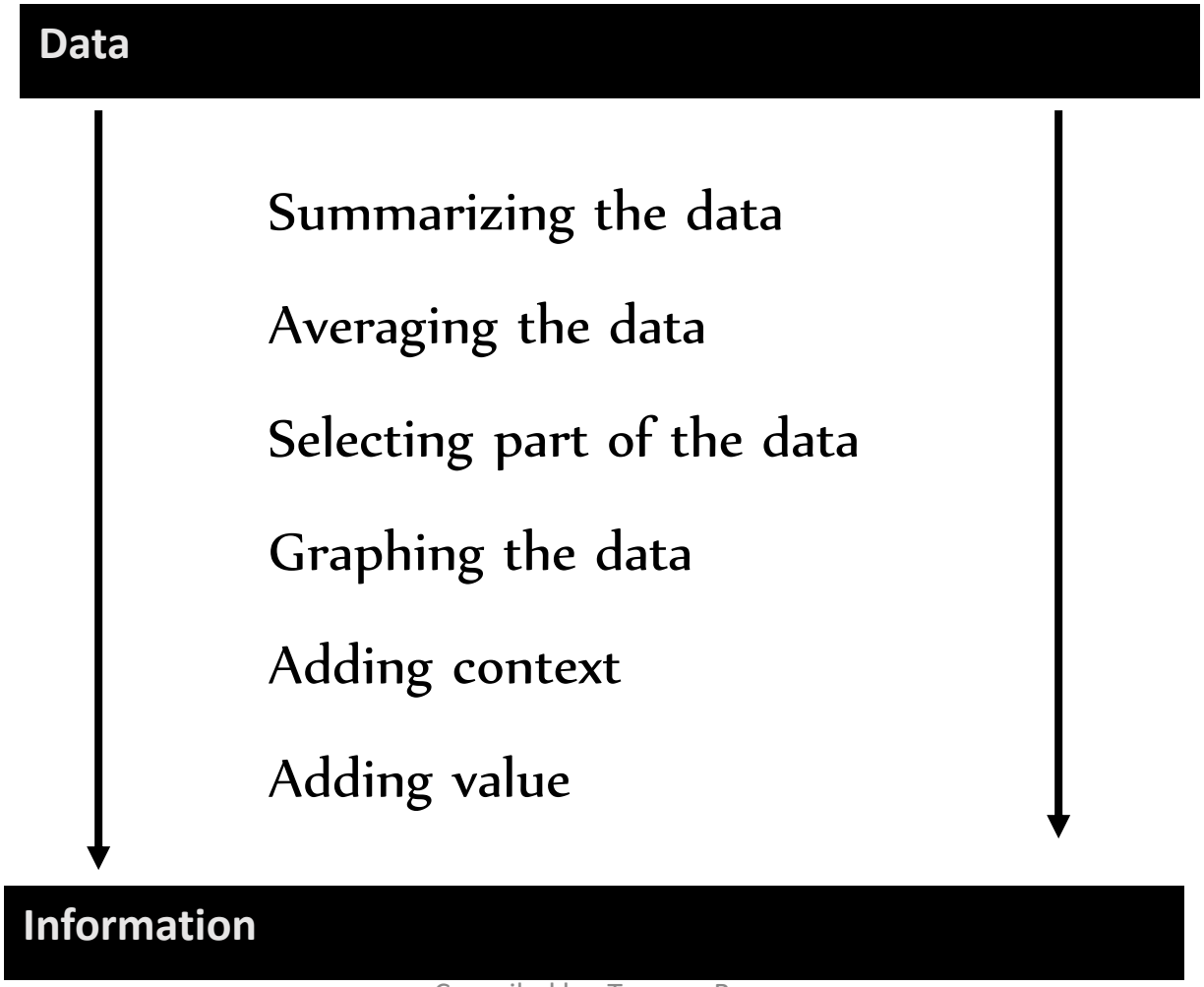
Data

- 6.34
- 6.45
- 6.39
- 6.62
- 6.57
- 6.64
- 6.71
- 6.82
- 7.12
- 7.06

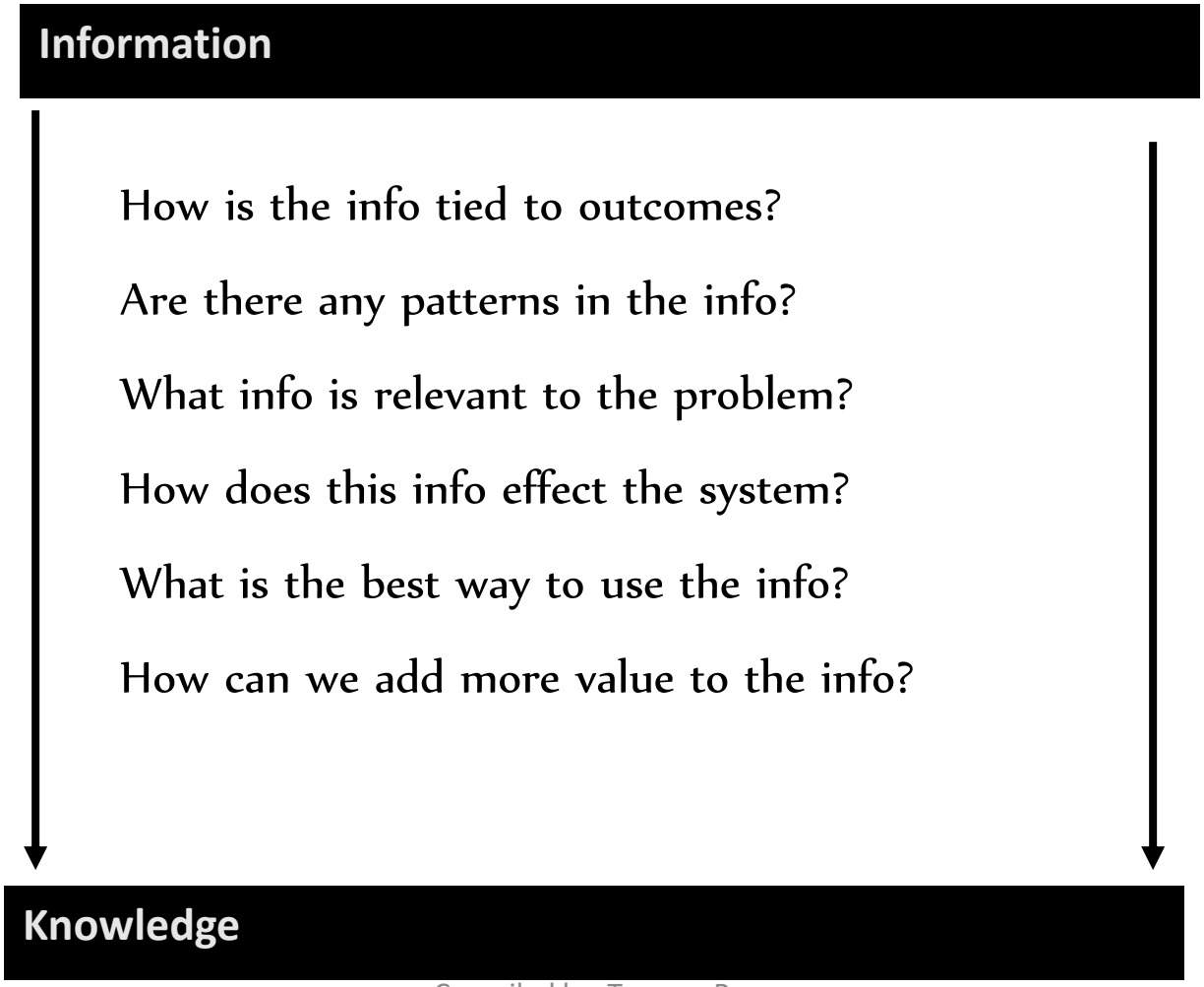
Information



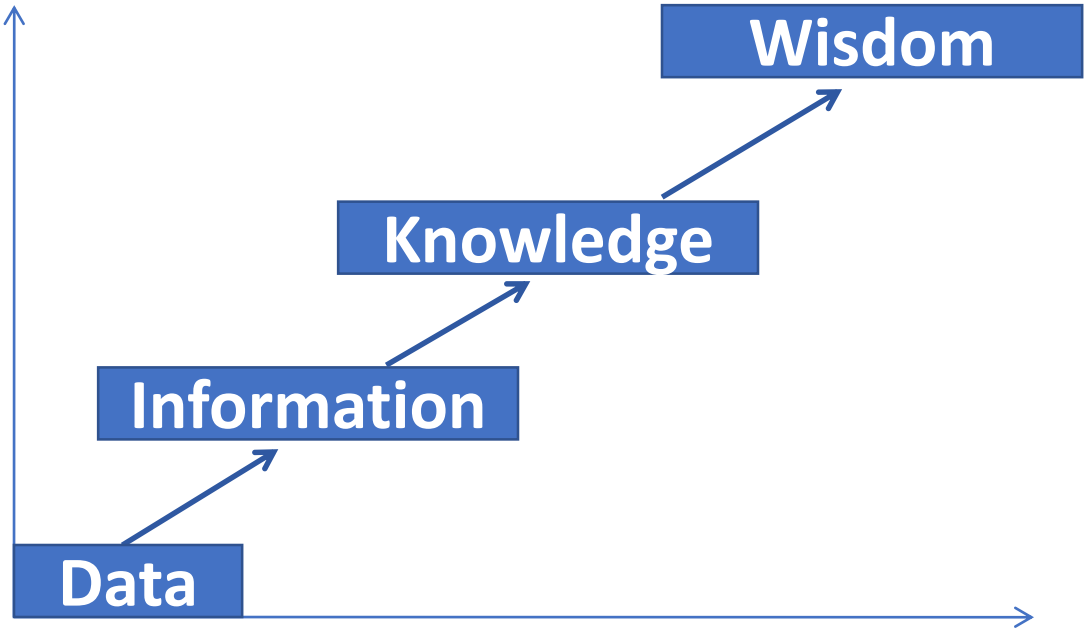
Data → Information → Knowledge



Data → Information → Knowledge



Summary



Knowledge Spectrum

Characteristics of information (1)

- Information that is meaningful for the people and the organization must have certain characteristics
- Good information is
  - That which is used and which creates value.
  - Relevant for its purpose,
  - Sufficiently accurate for its purpose,
  - Complete enough for the problem,
  - Reliable and targeted to the right person.
  - Communicated in time for its purpose,
  - Contains the right level of detail

Characteristics of information (2)

- Accurate: Information must not contain any errors. Sufficiently accurate for its purpose
- Accessible: Authorized users should be able to access the information whenever required.
- Complete: Information must contain all important and related data.
- Economical: Information should be economical to produce both in terms of time and cost.

Characteristics of information (3)

- Format: Information should be available in the desired format. Communicated by an appropriate channel, i.e. one that is understandable to the user.
- Flexible: Information should be flexible enough to be used for different purposes.
- Reliable: Information is dependable and is generated using correct data.
- Relevant: Information must be relevant so that it can be used by the organization.

Characteristics of information (3)

- Verifiable: There should be a means to crosscheck the available information.
- Secure: Unauthorized users should not be able to access the information. Access is allowed only to authorized individuals.
- Simple: Information must be easily understandable and usable. Complex information is difficult to use and may not serve its purpose.
- Timely: Information must be available when it is needed. Late or outdated information is of no use.

Use and Application Areas of Computers (1)

Why we use Computers?

The following are some of the capability computers.

- Store and process large amount of information with high speed and accuracy;
- Transmit information across continents via communication channels
- Simulate events
- Perform complex mathematical computations and make comparisons;

Use and Application Areas of Computers (2)

- Monitor ongoing industrial operations;
- Perform repetitive processes with great ease, speed, and reliability;
- computers have evolved in terms of increased computing power and decreased size.
- Life in today's world would be unimaginable without computers.

Use and Application Areas of Computers (3)

- Engineers, architects, jewelers, and film makers use computers to design things.
- Teachers, writers, and most office workers use computers for research, word processing and emailing.
- Small businesses can use computers as a point of sale and for general record keeping.

Application area of Computers/ICT (1)

- Learning Aids: learning toys
- Entertainment: games
- Commercial or business applications: text processing
- Scientific research applications: space technology
- Information Utilities :internet
- Electronic Banking and Service: online machine, ATM
- Shopping from Home

Application area of Computers/ICT (2)

- Household Control
- Weather and Environment: weather forecasting
- Transportation: air crafts are aided by computers
- Medical and Health Care: blood pressure, heart rate
- Routine and Dangerous Tasks: war
- Consultant (Expert system)

Application area of Computers/ICT (3)

EDUCATION

- Computers have its dominant use in the education field which can significantly enhance performance in learning.
- distance learning is made productive and effective through internet and video-based classes.
- Researchers have massive usage of these computers in their work from the starting to till the end of their scholarly work.
- Computers are used in teaching and research.
- students can solve different kinds of problems quickly and efficiently by using computers.
- It is used in a result processing.
- Exam preparation

Application area of Computers/ICT(4)

Computers in Health and Medicine

- Most of the medical information can now be digitized from the prescription to reports.
- Computation in the field of medicine allows us to offer varied miraculous therapies to the patients.
- radiotherapy wasn't possible without computers.
- Research in health.
- Development of Health Net of doctors and Hospitals
- CT Scanning and Ultra sound
- Record Keeping of patients

Application area of Computers/ICT (5)

Computers at Financial Institutions

- computers are being used by the financial institutions like banks for different purposes.
- The most important thing is to store information about different account holders in a database to be available at any time.
- Keeping the records of the cash flow, giving the information regarding your account.
- They are used in banks for record keeping and maintaining accounts of customers.
- Most of the banks provide the facility of ATMs. The customers can draw money through ATM card from any branch of that bank (or another bank) at any time of a day.

Application area of Computers/ICT (6)

Computers for Transport System

- With internet on computers we can know the details of the buses or trains or the flight available to our desired destination.
- The timings and even the updates on the delay can also be known through these computers.
- We can book our tickets through online.
- Staff of the transport system will keep a track of the passengers, trains or flight details, departure and arrival timings by using computers.
- Computers are used in cars to monitor fluid levels, temperatures and electrical systems.
- An air control traffic systems, where computers are used to control the flow of traffic between airplanes which needs a lot of precision and accuracy to be dealt with.

Application area of Computers/ICT (7)

Computers in Business

- Every single information shared can be recorded by using computer.
- Official deals and the issues were made even through online.
- Today, in global markets, it is impossible to run the business without the use of computer technology.
- Many business activities are performed very quickly and efficiently by using computers.
- The administrative paperwork is also reduced by using computers.
- Many business use websites to sell their products and contact their customers.
- Businessmen are using computers to interact with their customers anywhere in the world.
- Many business tasks are performed more quickly and efficiently.
- Computers also help them to reduce the overall cost of their business

Application area of Computers/ICT (8)

Computer for Defense

- Computers are the main tools which help in developing missiles and other equipment in the defense system.
- Designing and the maintenance are possible only through computers.
- Computer builds the links between the soldiers and commanders through the satellite.
- Construction of weapons and controlling their function is not possible without the aid of computers.
- The list of the criminals and the records of the cops are maintained regularly in the system.

Application area of Computers/ICT (9)

Computers for Entertainment

- Computers are now the major entertainers and the primary pass time machines.
- We can use computers for playing games, watching movies, listening to music, drawing pictures.
- Many computer games and other entertainment materials of different kinds are available on the Internet.

Agriculture

- Farmers use small computers to help with billing, crop information, and cost per acre, feed combinations, and market price checks.
- Cattle farmers can also use computers for information about livestock breeding and performance.

Application area of Computers/ICT(10)

Consultant (Expert system)

- An Expert system is a computer program, which can solve problems from a specific knowledge base.
- These systems don't replace expert humans because the knowledge base of expert system is given from the skilled specialist.
- Example: Mycin: a medical diagnostic program by using sophisticated decision making process).
- This expert system was designed to identify bacteria causing severe infections, such as bacteremia and meningitis, and to recommend antibiotics, with the dosage adjusted for patient's body weight.