

# INFORMATION



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# Information System Analysis and Design

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# 3

## CHAPTER

# INFORMATION

### 3.1 DATA & INFORMATION

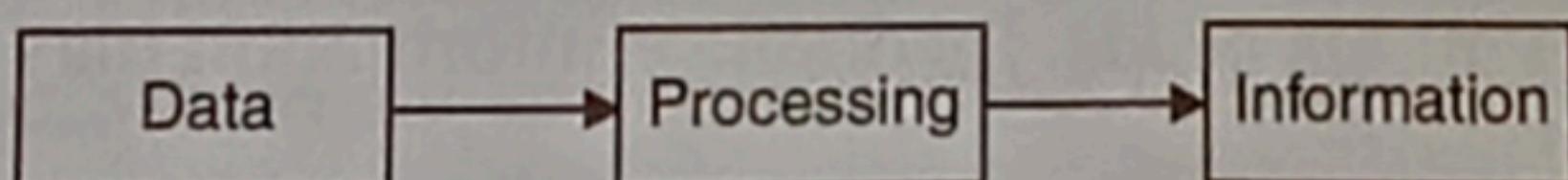
*Data* is a set of values of qualitative or quantitative variables; restated, pieces of data are individual pieces of information. Data is measured, collected and reported, and analysed, whereupon it can be visualized using graphs or images. Data as a general concept refers to the fact that some existing information or knowledge is represented or coded in some form suitable for better usage or processing.

- Data means raw facts.
- Data is like raw material.
- Data does not interrelate and also it does not help in decision making.
- Data is defined as groups of non-random symbols in the form of text, images, voice representing quantities, action and objects.

*Information* is stimuli that has meaning in some context for its receiver. When information is entered into and stored in a computer, it is generally referred to as data. After processing (such as formatting and printing), output data can again be perceived as information.

- Information is the product of data processing.
- Information is interrelated data.
- Information is equivalent to finished goods produced after processing the raw material.
- The information has a value in decision making.
- Information brings clarity and creates an intelligent human response in the mind.

*"Information is a data that has been processed into a form that is meaningful to recipient and is of real or perceived value in the current or the prospective action or decision of recipient".*



### **3.2 INFORMATION QUALITY**

Information is the most critical resource of the organization. Managing the information means managing future. Information is knowledge that one derives from facts placed in the right context with the purpose of reducing uncertainty. The parameters of a good quality are difficult to determine for information. Quality of information refers to its fitness for use or its reliability.

**Some of the attributes of information which influence the quality of information are as follows:**

- **Timeliness**:- Timeliness means that the information must reach the recipients within the prescribed time frame. If correct information is delivered late then it becomes useless. Timely information can ensure correct executive action at an early stage. For effective decision making, information must reach the decision-maker at the right time, i.e. recipients must get information when they need it. Delays destroy the value of information. The characteristic of timeliness, to be effective, should also include up-to-date, i.e. current information.
- **Accuracy** :-Accuracy is another key-attribute of information. An information is said to be accurate if
  - The information is free from mistakes and errors
  - Information is clear
  - It accurately reflects the meaning of data on which it is based.
  - It conveys an accurate picture to the recipient, who may require a presentation in graphical form rather than tabular form.
  - The information is free from bias. Wrong information given to management would result in wrong decisions.
- **Relevance** :-Relevance is another key attribute of management. Information is said to be relevant if it answers specifically for the recipient what, why, where, who and why? The MIS should serve reports to managers, which are useful, and the information helps them make decisions. Different levels of management require different types of information. The information delivered should be relevant and useful to that level of management
- **Adequacy** :-Adequacy means information must be sufficient in quantity. MIS must provide reports containing information, which is required in deciding processes of decision-making. The report should not give either inadequate or more than adequate information, which may create a difficult situation for the decision-maker. Whereas inadequacy of information leads to crisis, information overload also results in chaos.
- **Completeness** :-The information, which is provided to a manager, must be complete and should meet all his needs. Incomplete information may result in wrong decisions

- **Explicitness** :-An information is said to be of good quality if it does not require further analysis by the recipient for decision-making. Thus the reports should be such that a manager does not waste any time on the processing of the report, rather he should be able to extract the required information directly.
- **Exception based** :-Top managers need only exception reports regarding the performance of the organization. Exception reporting principle states that only those items of information, which will be of particular interest to a manager, are reported. This approach results in saving precious time of the top management and enables the managers to devote more time in pursuit of alternatives for the growth of the organization.

### **3.3 DIMENSIONS OF INFORMATION**

**Information has three dimensions:**

- Economic dimension
- Business dimension
- Technical dimension.

#### **3.3.1 Economic Dimension**

This dimension of information refers to the cost of information and its benefits. The cost may include

- Cost of acquiring data,
- Cost of maintaining data,
- Cost of generating information
- Cost of communicating information.

Before a particular piece of information is acquired, decision-makers must know its value. The value of information is the value of the change in decision or behaviour because of the information. The change in the behaviour due to new information is measured to determine the benefits from its use. To arrive at the value of new information, the cost incurred to get this information is deducted from the benefits.

#### **3.3.2 Business Dimension**

Information can also be understood from its business dimension. Different types of information are required by managers at different levels of the management hierarchy. Managers at different levels are required to perform different functions in the organization.

#### **3.3.3 Technical Dimension**

This dimension of information refers to the technical aspects of the database. Various aspects of the database, which are considered under this dimension, include the capacity of

### 3.4 TYPES OF INFORMATION

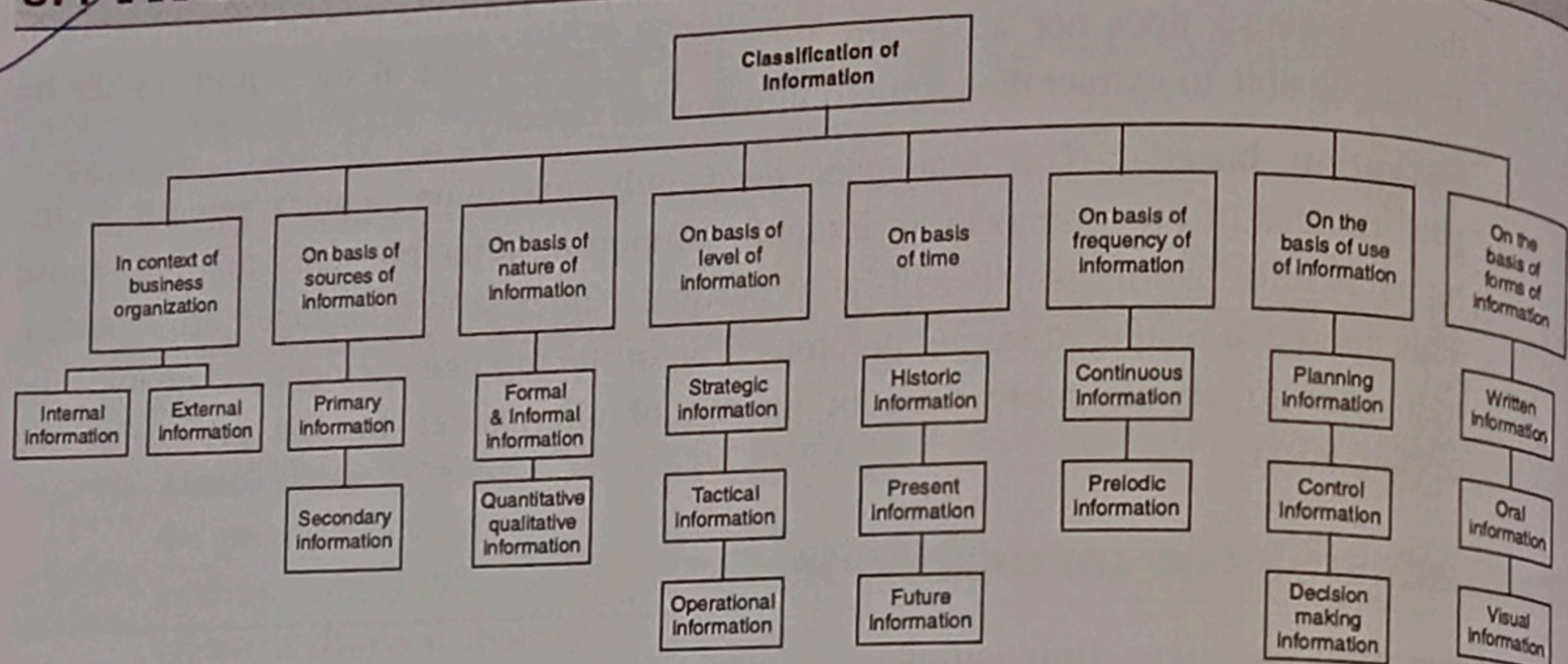


Fig 3.1 Types of Information

#### 3.4.1 Classification in context of Business Organization

In the context of business organization, it carries two types of information i.e. Internal & External information. The following figure shows the further classification of internal and external information.

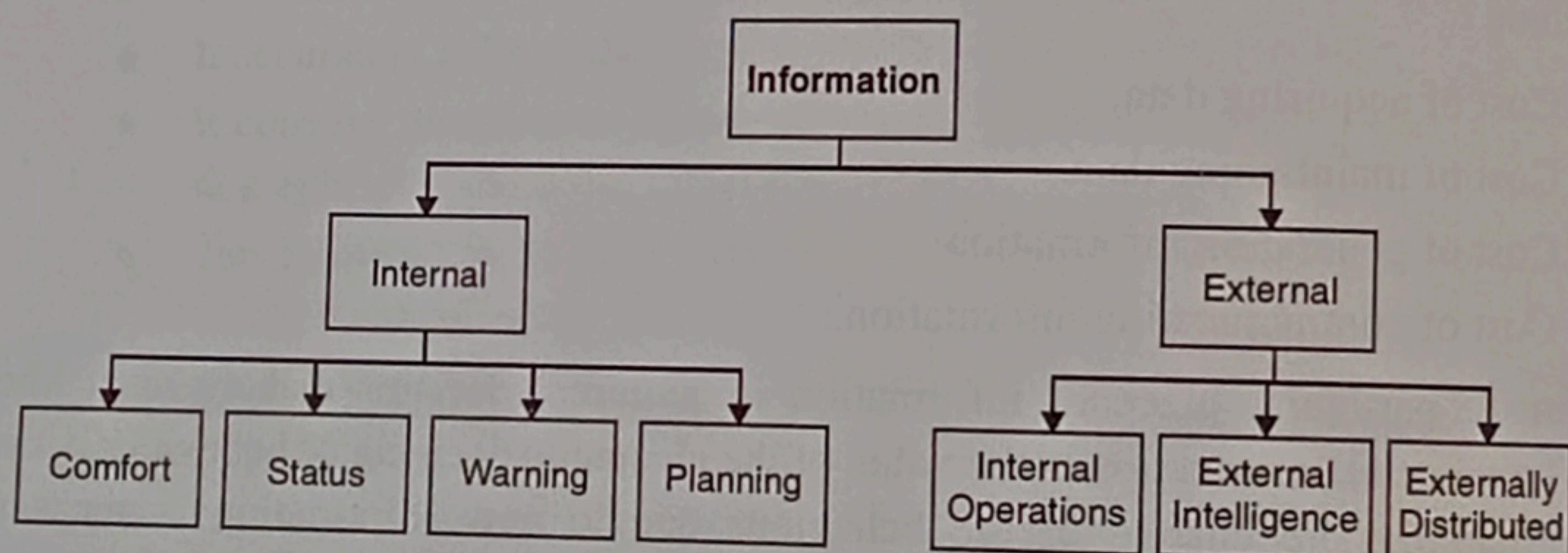


Fig 3.2 Classification of information in context of Business Organization

- **Internal Information** :-The information which is collected from the sources, internal to the organization is called internal information. This information is generated from the operations of the organization at various functional levels.

**Types of internal information are:**

- **Comfort information:** It informs about current situation or achievement levels that are tuned to expectations. Information regarding clients served, target achieved, patients treated, operations conducted are included in this type of information.

- **Status information or progress information:** It keeps record of current problem and crisis and changes. Information like progress on office construction, status of research study, labour negotiation is known as status information.
- **Warning information:** It signals that change is for good or worse is occurring. For example, stock price, turn over, client complaints, etc.
- **Planning information:** Description of projects/programs due in future, knowledge of anticipated developments (future of funding, future of federal/provincial Support).
- **Internal operations information:** These are indicators on how organization/program are performing.
- **External Information** :-The information which is collected from the sources external to the organization is called external information. This information is generated in the environment of the organization. This information is generally required by the top level management. For example: Government policies, economic trends, market information, competitive information etc. are some examples of external information.

**Some types of external information are:**

- External intelligence: Information, gossip, and opinions about activities in the environment of the agency are collectively called external intelligence. Examples of such type of information are Competition, funding policies, political changes, emerging social policies etc.
- Externally distributed information: Annual report before release, Quarterly progress report for donors, Press releases about the agency, Publicity material before printing, etc are included in such type of information.

### 3.4.2 Classification on Basis of Sources of Information

In the context of sources of information, it carries two types of information i.e. primary & secondary information. Information can come from virtually anywhere — media, blogs, personal experiences, books, journal and magazine articles, expert opinions, encyclopedia's, and web pages-and the type of information you need will change depending on the question you are trying to answer.

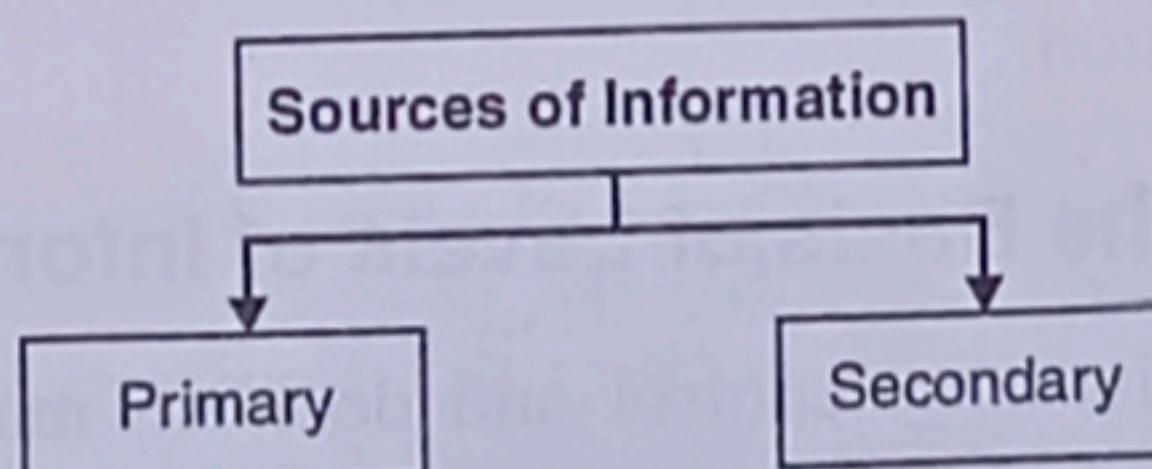
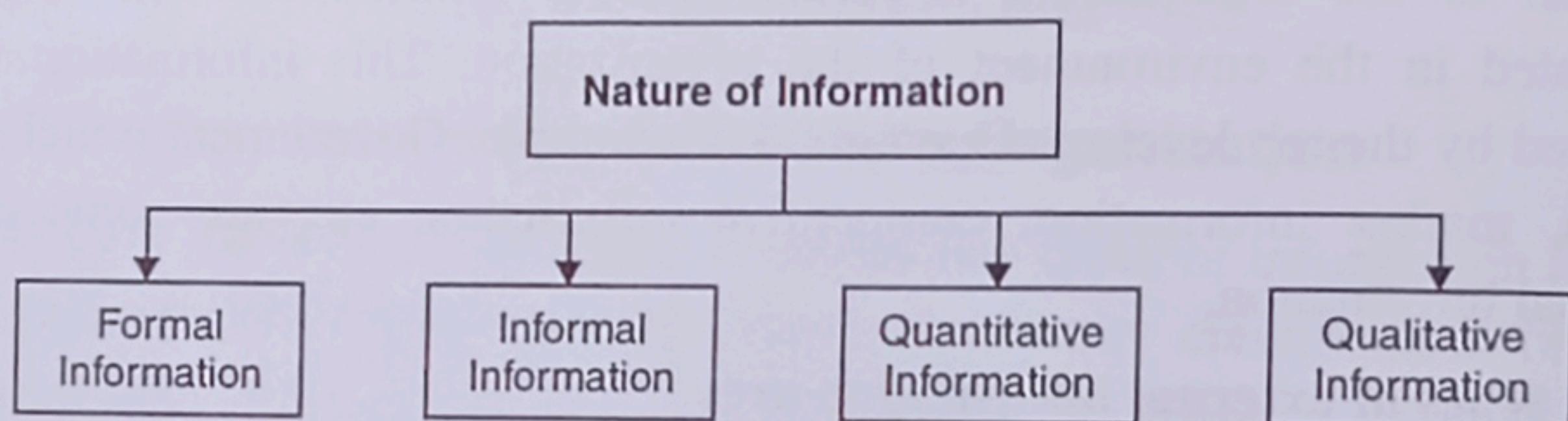


Fig 3.3 Classification of information in context of sources of information

- **Primary Information** :-A primary source of information is the one that provides data from an original source document. This may be as simple as an invoice sent to a business or a cheque received. A primary source is defined as being where a piece of information appears for the first time.
- **Secondary Information** :-A secondary source of information is one that provides information from a source other than the original. Secondary sources are processed primary sources, second hand versions. Examples of secondary sources could be an accounts book detailing invoices received, a bank statement that shows details of cheques paid in and out.

### 3.4.3 Classification on the Basis of Nature of Information

In the context of sources of information, it carries four types of information *i.e.* formal information, informal information, quantitative information, and qualitative information.



**Fig 3.4 Classification of information in context of nature of information**

- **Formal Information** :-This involves presenting information in a structured and consistent manner. It is usually defined, within an organization, as the main way of communicating between and within parts of the organization. The main methods of formal communication are the formal letter, properly structured reports, writing of training materials, etc.
- **Informal Information** :-This describes less well -structured information which is transmitted within organization or between individuals who usually know each other.
- **Quantitative Information** :-This is information that is represented numerically. Any event or object that is represented as a set of numbers is an example of quantitative information.
- **Qualitative Information** :-This is information that is represented using words. Any event or object represented using words to describe its attributes is an example of qualitative information.

### 3.4.4 Classification on the Basis of Levels of Information

Within an organization planning, control and decision making is carried out at levels within the structure of the organization. The three levels at which information be used are strategic, tactical and operational.

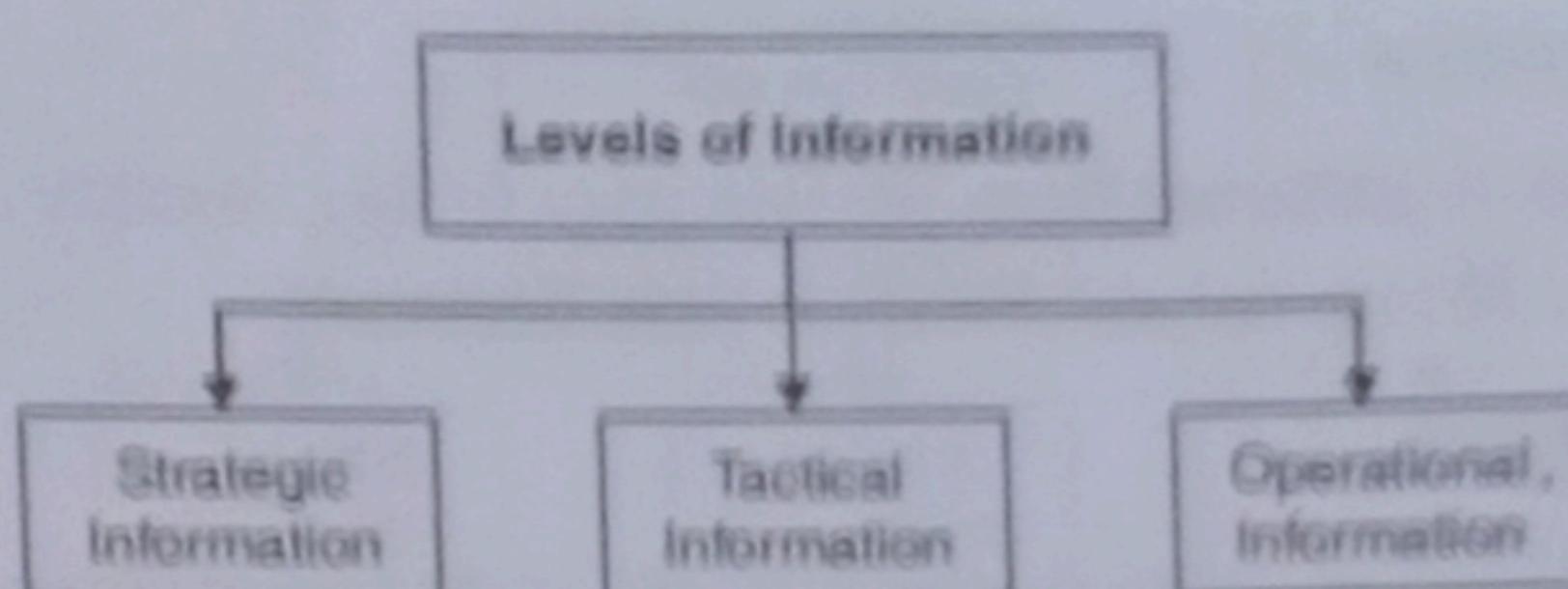


Fig 3.5 Classification of information in context of levels of information

- **Strategic Information** :-Strategic information is used at the very top level of management within an organization. These are chief executives or directors who have to make decisions for the long term. Strategic information is broad based and will use a mixture of information gathered from both internal and external sources.
- **Tactical Information** :-The next level down is the tactical level and tactical planning and decision making takes place within the guidelines set by the strategic plan. Tactical information will be mostly internal with a few external sources. Tactical plans have a medium level of detail and will be very specific. They deal with such matters as who is doing what and within what specific budgets and timescales.
- **Operational Information** :-The information requirements at the lower level of management hierarchy involve the decisions that are very repetitive and simple. So such types of systems are to be very simple and involve minimum investment.

#### 3.4.5 Classification on the Basis of Time

In the context of basis of time, it carries three types of information i.e. historic information, present information, and future information.

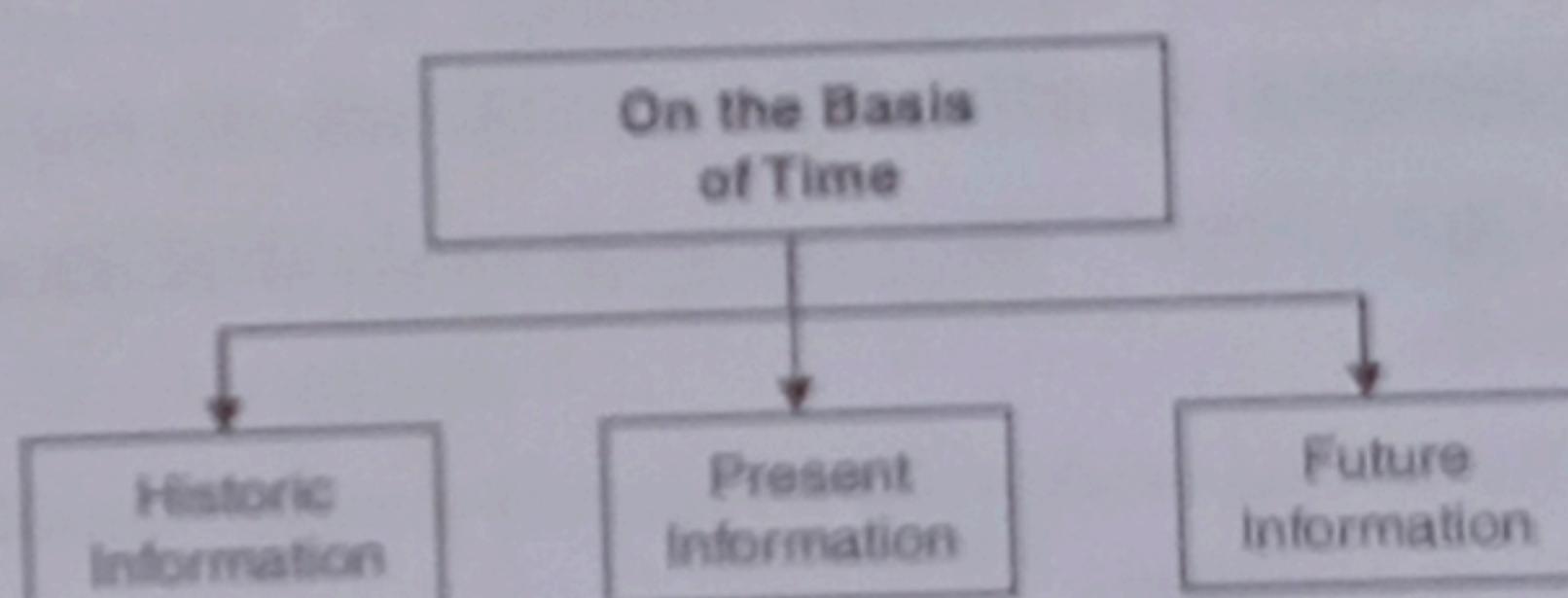


Fig 3.6 Classification of information on basis of time.

##### • **Historic Information**

- This information is gathered over a period of time.
- It is collected from the previous records or historical data of the organization.
- It allows decision makers to draw the comparisons between previous and present activities.
- It is used to improve the standards of organization.

- **Present information**

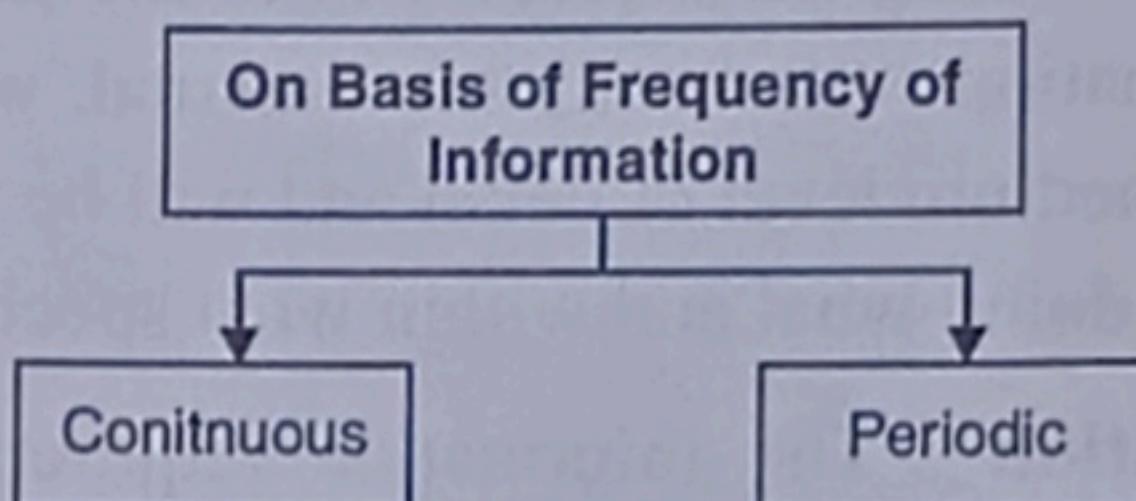
This information is gathered from present (day to day, weekly, monthly) activities in an organization. This is helpful for short term decisions.

- **Future information**

- This information is created from historic and present information and is used to predict future activities.
- This is helpful for long term decisions.
- It is used to improve the standards of organization in the future.

### 3.4.6 Classification on the Basis of Frequency of Information

In the context of basis of frequency of information, it carries two types of information *i.e.* continuous information and periodic information.

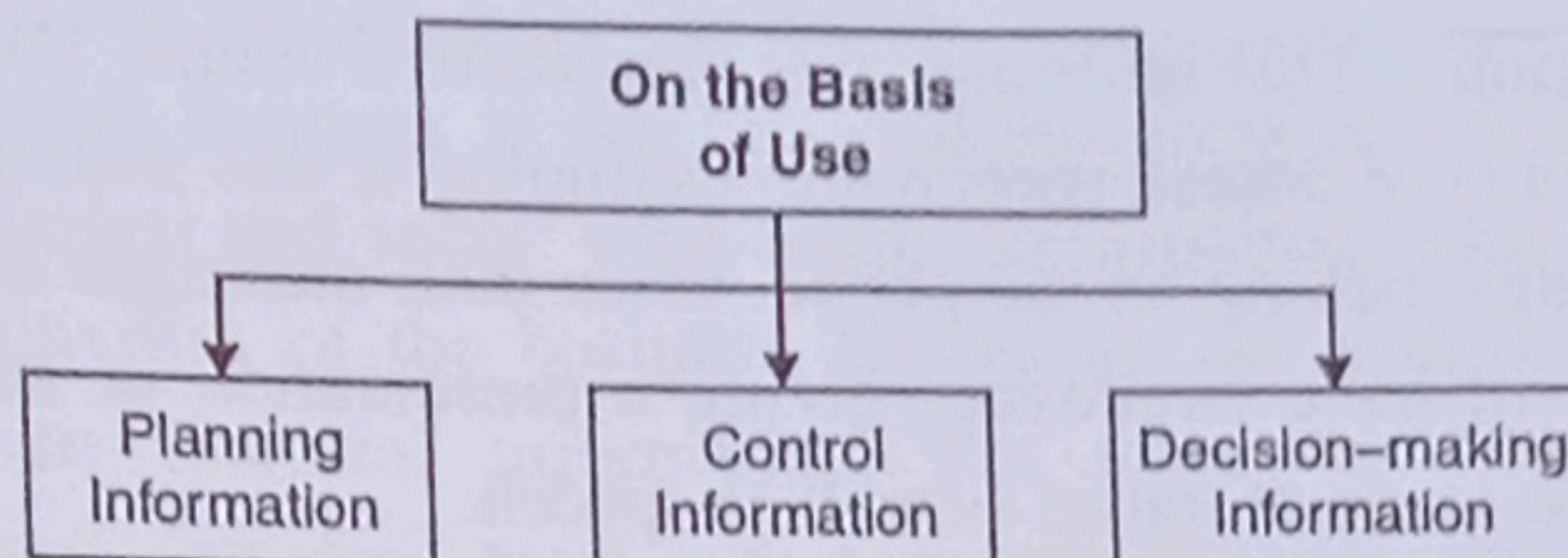


**Fig 3.7 Classification of information on basis of frequency of information**

- **Continuous Information** :—This information is created from data gathered several times a second. The information is updated at every second.
- **Periodic Information** :—This information is created at regular time intervals (hourly, daily, monthly, annually). Different examples of information generated by an organization are needed at specific periods of time:
  - **Annually** – On an annual basis a company must submit its report and accounts to the shareholders.
  - **Monthly** – Banks and credit card companies produce monthly statements for the majority of their customers.
  - **Daily** – A supermarket makes daily summaries of its sales and uses the product information to update its stock levels and to reorder stock automatically.
  - **Hourly** – A busy call centre may often update totals for each operator on an hourly basis and give the top employee for the hour some reward.

### 3.4.7 Classification on the Basis of Use of Information

In the context of basis of use of information, it carries three types of information *i.e.* planning, control and decision-making information.

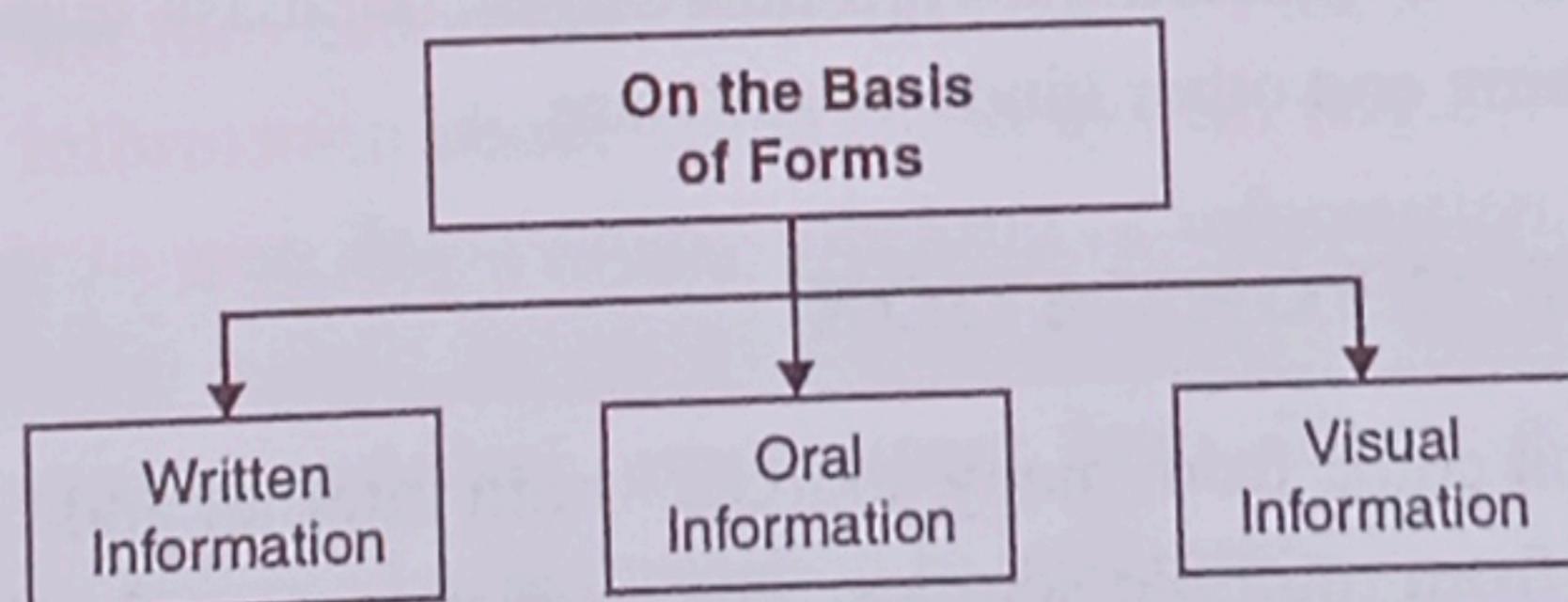


**Fig 3.8 Classification of Information on basis of use of Information**

- **Planning Information** :—This information is required for the planning. Planning is the process of deciding in advance the future course of action or what has to be done and how it is to be done. Planning should be based on good information. Planning is not an end in itself: its primary purpose is to provide the necessary structure for decision making and resulting actions, throughout the organization. The process of planning provides an opportunity to construct a sequence of actions that, when executed, will achieve the required aims and objectives.
- **Control Information** :—The information required for controlling is known as control information. Control can be defined as the monitoring and evaluation of current progress against the steps of a pre-determined plan or standard. If these tasks are not proceeding in line with expectations, then action is taken to bring the project back in line with what had been planned. Control is carried out at strategic, tactical and operational levels.
- **Decision-making Information** :—Decision-making is the process of selecting an action, from the available actions, based on the information available. Decision-making involves determining and examining the available actions and then selecting the most appropriate actions in order to achieve the required results.

#### 3.4.8 Classification on the Basis of Forms of Information

In the context of basis of forms of information, it carries three types of information i.e. written, oral and visual information.



**Fig 3.9 Classification of Information on basis of forms of information**

- **Written Information** :—The vast majority of information created within an organization is in the written form. This includes hand written or word processed information and information in e-mails as well as reports produced from different classes of software. Examples of written information are reports, memos & tables etc.

- **Oral Information** :-This information is presented as sound. The commonest form of oral information is of course speech and examples of this would be formal meetings, informal meetings, talking on the phone, voice mail messages etc. Now a days many organizations will have employees giving a presentation or talk to a group where there may be use made of music as well as speech.
- **Visual Information** :-This form of information includes pictures, charts and graphs to communicate information.

### 3.5 CAPTURING INFORMATION

Information capture is the process of collecting paper documents, forms and e-documents, transforming them into accurate, retrievable, digital information, and delivering the information into business applications and databases for immediate action. The two basic methods for information capturing are manual and electronic.

**The most common ways of capturing information electronically are:**

- **Bar code:** A visual pattern that represents numerical data by varying the thickness and pattern of vertical bars is known as bar code.
- **Radio Frequency Identification (RFID) tags:** Microchips that transmit information via radio waves and can be used to track the number and location of the objects into which the tags have been inserted are known as RFID tags.
- **Electronic scanner:** Electronic scanner is an electronic device that converts printed text and pictures into digital images. Electronic scanners are inexpensive but may require optical character recognition software to scan and convert original or digitized documents into ASCII text.
- **Optical character recognition:** It is a software used to convert digitized documents into ASCII text (American Standard Code for Information Interchange) so that it can be searched, read, and edited by word processing, database management, spreadsheet, desktop publishing and other kinds of software.

### 3.6 SOURCES OF INFORMATION

Data and information come from many sources - both internal and external. Business data and information comes from multiple sources. The challenge for a business is to capture and use information that is relevant and reliable.

**The main sources are:**

- **Internal Information:** Accounting records are a prime source of internal information. They detail the transactions of the business in the past - which may be

used as the basis for planning for the future. The accounting records are primarily used to record what happens to the financial resources of a business. For example, how cash is obtained and spent; what assets are acquired; what profits or losses are made on the activities of the business. However, accounting records can provide much more than financial information. For example, details of the products manufactured and delivered from a factory can provide useful information about whether quality standards are being met. Data analysed from customer sales invoices provides a profile of what and to whom products are being sold. A lot of internal information is connected to accounting systems - but is not directly part of them.

**For example:**

- Records of the people employed by the business (personal details; what they get paid; skills and experience; training records)
- Data on the costs associated with business processes (e.g. costings for contracts entered into by the business)
- Data from the production department (e.g. number of machines; capacity; repair record)
- Data from activities in direct contact with the customer (e.g. analysis of calls received and missed in a call centre)

A lot of internal information is also provided informally. For example, regular meetings of staff and management will result in the communication of relevant information.

- **External Information:** As the term implies, this is information that is obtained from outside the business.

**There are several categories of external information:**

(a) **Information relating to way a business should undertake its activities:** Businesses need to keep records so that they can collect taxes on behalf of the government. So a business needs to obtain regular information about the taxation system (e.g. VAT, Corporation Tax) and what actions it needs to take. Increasingly this kind of information is provided in digital format. Similarly, a business needs to be aware of key legal areas (e.g. environmental legislation; health & safety regulation; employment law). There is a whole publishing industry devoted to selling this kind of information to businesses.

(b) **Information about the markets in which a business operates:** This kind of external information is critically important to a business. It is often referred to as "market" or "competitive intelligence". Most of the external information that a business needs can be obtained from marketing research.

Marketing research can help a business do one or more of the following:

- Gain a more detailed understanding of consumers' needs – Marketing research can help firms to discover consumers' opinions on a huge range of issues, e.g., views on products' prices, packaging, recent advertising campaigns
- Reduce the risk of product/business failure – There is no guarantee that any new idea will be a commercial success, but accurate and up-to-date information on the market can help a business make informed decisions, hopefully leading to products that consumers want in sufficient numbers to achieve commercial success.
- Forecast future trends – Marketing research can not only provide information regarding the current state of the market but it can also be used to anticipate customer needs/future customer needs. Firms can then make the necessary adjustments to their product portfolios and levels of output in order to remain successful.

The information for marketing research tends to come from three main sources:

- Internal Company Information – Such information is collected from sales, orders, customer profiles, stocks, customer service reports
- Marketing intelligence – This is a catch-all term to include all the everyday information about developments in the market that helps a business prepare and adjust its marketing plans. It can be obtained from many sources, including suppliers, customers and distributors. It is also possible to buy intelligence information from outside suppliers who will produce commercial intelligence reports that can be sold profitably to any interested organisation.
- Market Research – The existing data from internal sources may not provide sufficient detail. Similarly, published reports from market intelligence organisations cannot always be relied upon to provide the up-to-date, relevant information required. In these circumstances, a business may need to commission specific studies in order to acquire the data required to support their marketing strategy.

### 3.7 VALUE OF INFORMATION

The value of information is a very slippery concept as information per se does not have any universal value. Its value is related to the person who uses it, when he uses it and for what he uses it. Any assessment of the value of information is therefore related to the value of the decision-making supported by such information. The same information can have different value for different people at different points in time. Hence, it will be fair to conclude that value of information is relative. There is no absolute value of information.

Information has a cost for its acquisition and maintenance. Thus before a particular piece of information is acquired, decision maker must know its value. The information has a perceived value in terms of decision making. Thus, value of information is the amount a decision maker would be willing to pay for information prior to making a decision. The decision maker feels more secured when additional information is received in case of decision making under uncertainty or risk.

The information is called a *Perfect Information*, if it wipes out uncertainty or risk completely. However, perfect information is a myth. The value of information is the value of the change in decision behavior because of the information. The change in the behaviour due to new

information is measured to determine the benefit from its use. To arrive at the value of information, the cost incurred to get this information is deducted from the benefit.

$$\text{Value of information} = \text{Cost to get information}-\text{benefit}$$

Given a set of possible decisions, a decision maker will select one on the basis of the available information. If the new information causes a change in the decision, then the value of information is the difference in the value between outcome of the old decision and that of new decision, less the cost obtaining the new information. The value of the additional information making the existing information perfect (VPI) is:

$$VPI = (V_2 - V_1) - (C_2 - C_1)$$

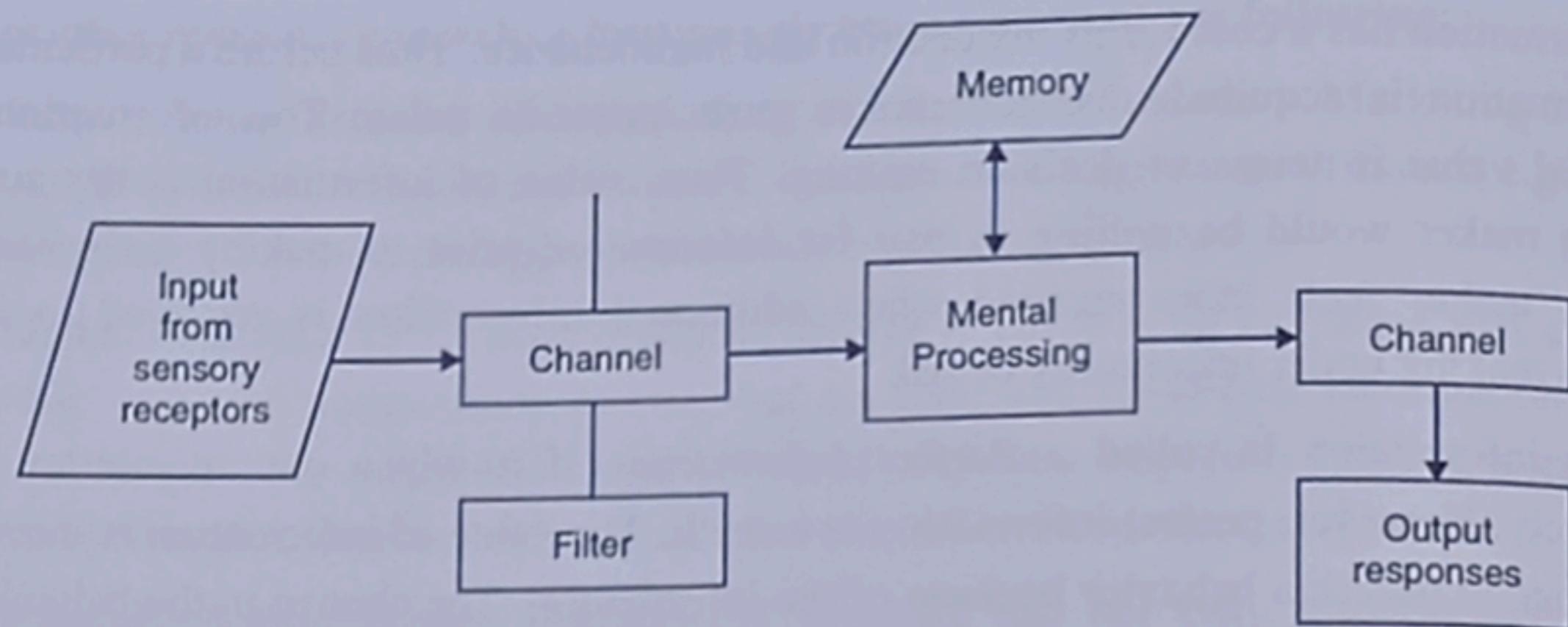
where 'V' is the value of the information and 'C' is the cost of obtaining the information. ' $V_1$ ' and ' $C_1$ ' relate to one set of information ' $V_2$ ', ' $C_2$ ' relate to the new set.

In MIS, the concept of the value of information is used to find out the benefit of perfect information and if the value is significantly high, the system should provide it. If the value is insignificant, it would not be worth collecting the additional information.

### 3.8 HUMAN AS AN INFORMATION PROCESSOR

A simple model of the human as an information processor consists of the following three things:

- Sensory receptors (eyes, ears, nose, etc.) that pick up signals and transmit them to the brain
- Processing unit (brain with storage).
- Output responses (physical, spoken, written, etc.).



**Fig 3.10 Human as Information Processor**

Sensory receptors include eyes, ears, skin, etc. These receptors capture stimuli, which may be visual, auditory, tactile and others, from the environment and transmit them to the processing unit, i.e. the brain. The processing unit (the brain) uses a variety of specialized processing centers and memory units to handle different types of processing and memory functions. The results of the processing of stimuli by brain are response outputs, such as decisions taken and tasks performed. These results may also be in the form of physical movements, speech and other responses.

The model which has been discussed in the above paragraph, is a simplified version of the Newell-Simon model of human information processing system. Allen Newell and Herbert A. Simon (1972) proposed a model of the human information processing system which consists of a processor, sensory input, motor output and three different memories: long-term memory (LTM), short-term memory (STM), and external memory (EM). STM is a part of the processor and is very small. It can store only a few (five to seven) units or chunks of information. A chunk is a unit of stored information, which can be a digit, a word or an image. The long-term memory is believed to have an unlimited capacity to store information. Storage is in compressed form and requires only a fraction of a second to recall from long-term memory but the write time (to memorize) is longer (say, 5 k to 10 k seconds for k symbols). This means long-term memory will take an average of 50-100 seconds to memorize a 10-digit member. However, after its storage, one can recall it in a few hundred milliseconds. The external memory in the human processing system may be represented by an external media such as a notebook, chalkboard, etc. Humans have a limited capacity to accept input for producing meaningful output. However, the environment provides more input than a human is able to accept. Thus, in order to avoid information overload, the human information processing system filters out the inputs to a manageable quantity. This information filtering may be based on a number of factors which may be inborn or have been acquired from past experience, knowledge and cultural background.

To selectively process information, a large variety of conceptual frameworks are used by humans. There have been empirical evidences which show that humans develop frames of reference or intuitive patterns of information capture and processing, when confronted with a

task. This problem of recall of information sp...  
rules or heuristics to...  
Humans may also ex...  
has to consider. De...  
unnecessary to the de...  
increased to concentrat...  
Bias or limitation...  
filtering. For example,...  
There is a tendency in...  
statistically significant...  
example, humans tend...  
or prefer. Similarly,...  
probability.

task. This problem space, conceptually a 'workspace', is used to structure and limit input and recall of information and processing methods. This may lead to use a number of intuitive rules or heuristics to help an individual reduce the number of alternatives to be considered. Humans may also exhibit a trait of bounded rationality to limit the alternatives an individual has to consider. Decision rules also help providing filters to screen factors which are unnecessary to the decision. Similarly, when a decision is to be made under stress, filtering is increased to concentrate only on the most important problem.

Bias or limitations in human's cognitive process is another source of information filtering. For example, Miller (1956) has suggested that short-term memory in humans cannot effectively process more than nine units of information (seven plus or minus two  $7 \pm 2$ ). There is a tendency in humans to overlook small changes in a value, even though they may be statistically significant. Humans also tend to be biased because of many biasing factors, for example, humans tend to give higher weight age or probabilities to outcomes which they like or prefer. Similarly, easily remembered or imagined events may be assigned a higher probability.



# 6

## CHAPTER

# MANAGEMENT INFORMATION SYSTEM

### 6.1 INTRODUCTION

MIS consists of three different words: Management, Information and System. So, to understand the meaning of MIS we have to understand the meaning of these three things individually. Management is the act of getting people together to accomplish desired goals and objectives using available resources efficiently and effectively. Data in a processed form is known as information. A system is a set of interacting or interdependent components integrated together for a particular purpose.

From these three definitions we can finally form the definition of MIS:

“MIS is a set of interacting components integrated together to provide information which can help in managing things efficiently and effectively”.

- It refers to a computer-based system that provides managers with the tools for organizing, evaluating and efficiently running their departments
- A management information system is a combination of information technology and people's activities that support operations, management and decision making.
- A management information system provides information that is needed to manage organizations efficiently and effectively.
- MIS involve three primary resources: people, technology, and information or decision making.

### 6.2 NATURE/CHARACTERISTICS OF MIS

A management information system has the following characteristics:

- **Management-oriented:** The basic objective of MIS is to provide information that supports the management of the organization in decision making. So an effective

MIS should begin with appraisal of management needs and goal of the organization. The MIS should be such that it serves all the levels of management in an organization i.e. top, middle and lower level.

- **Management directed:** As MIS is management-oriented; it should be directed by the management because it is the management who can tell its needs and requirements more effectively than anybody else. A manager should guide the MIS professionals not only at the stage of planning but also in development, review and implementation stages so that effective system should be the end product of the development process.
- **Integrated:** Integration means a comprehensive or complete view of all the sub systems in the organization. MIS is a system which consists of various sub parts joined together for a common purpose. So all the parts should be integrated together to get more meaningful and useful information.
- **Common data flows:** The integration of different sub systems will lead to a common data flow which will further help in avoiding duplicity and redundancy in data collection, storage and processing. Data is collected by a system analyst from its original source only one time. Then he utilizes the data with minimum number of processing procedures and uses the information for producing output documents and reports in small numbers and eliminates the undesirable data. This will lead to elimination of duplication, simplification of the operations and production of an efficient management information system.
- **Heavy planning-element:** The preparation of MIS is not a one or two-day exercise. It usually takes 3 to 5 years and sometimes a much longer period. So the system expert has to keep in mind the future objectives as well as the current requirements of the organization. He should make sure that his MIS will not be obsolete before it gets into action.
- **Sub System concept:** Although MIS is viewed as a single entity but for its development, it should be broken down in small parts or subsystems so that more attention is paid to each sub system. While making or breaking down the whole MIS into subsystems, it should be kept in mind that the subsystems should be easily manageable.
- **Common database:** This is the basic feature of MIS to achieve the objective of using MIS in business organizations. It avoids duplication of files and storage which leads to reduction in costs. Common database means a "Super file or Master file" which consolidates and integrates data records formerly stored in many separate data files. The organization of the database allows it to be accessed by each subsystem and thus, eliminates the necessity of duplication in data storage, updating, deletion and protection.
- **Computerized:** The use of computers increases the effectiveness and the efficiency of the system. The queries can be handled more quickly and efficiently with the

computerized MIS. The other benefits are accuracy, storage capacity and timely information.

- **Flexibility:** An MIS should be flexible i.e. there should be room for further modification because the MIS takes much time in preparation and our environment is dynamic in nature.
- **User friendly:** MIS should be such that it can be used independently & easily by the end user so that they do not depend on the experts.
- **Information as a resource:** Information is the major ingredient of any MIS. So, an MIS should be treated as a resource and managed properly

### 6.3 ROLE OF MIS

The role of the MIS in an organization can be compared to the role of heart in the body. The information is the blood and MIS is the heart. In the body the heart plays the role of supplying pure blood to all the elements of the body including the brain. The MIS plays exactly the same role in the organization. The system ensures that an appropriate data is collected from the various sources, processed, and sent further to all the needy destinations. The system is expected to fulfill the information needs of an individual, a group of individuals, the management functionaries: the managers and the top management.

- MIS gives operational data for planning, scheduling and control.
- It helps in decision making and to correct an out of control situation.
- MIS helps top management in goal setting, formulating business plans and their implementation.
- It helps in generating information, communicating of the generated information, problem identification and helps in the process of decision making.
- The MIS helps the clerical personnel in the transaction processing and answers their queries on the data pertaining to the transaction, the status of a particular record and references on a variety of documents.
- The MIS helps the middle management in short term planning, target setting and controlling the business functions. It is supported by the use of the management tools of planning and control.
- The MIS plays the role of information generation, communication, problem identification and helps in the process of decision making. The MIS, therefore, plays a vital role in the management, administration and operations of an organization.

### 6.4 BENEFITS/ADVANTAGES OF MIS

- (a) MIS improves the performance and productivity of the organization.

- (b) It helps in the management of marketing, finance, production and improves the skills of the employees.
- (c) It helps the employees to monitor the various department functions.
- (d) It gives the reports regarding progress, achievements and the errors in the day to day functioning.
- (e) It is used to control the various operations involved in the smooth functioning of the organization.
- (f) It helps in improving the discipline among the employees.
- (g) It helps to regulate the operations which complicate the day to day functioning.
- (h) It helps to yield good results by experimentation and modeling.

## 6.5 LIMITATIONS OF MIS

- (a) Highly sensitive and requires constant monitoring.
- (b) Budgeting of MIS is extremely difficult.
- (c) Lack of flexibility to update itself.
- (d) Lots of time required to construct or prepare MIS.
- (e) Constant training required.
- (f) In depth study or required training has to be carried out before designing the software.
- (g) Organizational change: Difficult to adapt in new settings for Employees.
- (h) Quality and reliability of the available information.
- (i) The expense to create and implement an MIS.
- (j) Training time for employees.
- (k) Capturing wrong or incomplete information.
- (l) Sometimes when the information is wrong, it creates chaos in organisation.

## 6.6 COMPONENTS OF MIS

Management Information System (MIS) is an organized combination of people, hardware, communication networks and data sources that collects, transforms and distributes information in an organization.

**The physical components of an MIS are given below:**

- ❖ **Hardware:** All physical components of a computer system compose the computer hardware. These components include the central processing unit, input/output devices, storage units and communication devices. Communication can be over fiber-optic cables or wireless networks.

**MANAGEMENT INFO**

- ❖ Software: Software can be system software or purpose programs.
- ❖ Database: A database control reduces redundancy and structured way. The database improves efficiency than separate files.
- ❖ Procedures: Three effectively: user instructions for MIS.
- ❖ Personnel: The person the other way. For ex. managers. Human resources present system needs a key factor in its efficiency.

## 6.7 FUNCTIONS OF MIS

MIS is set up by an organization to be used by its following functions in order to achieve its objectives.

- ❖ Data Capturing: MIS users, typically record data from paper form or enter it directly into the system.

- ❖ Processing of data: The management information system performs activities like comparing, sorting, classifying, summarizing, etc.

- ❖ Storage of information: Any information is not immediately used. In this activity, data are stored. Stored data is communicated to other users.

- ❖ Retrieval of information: Required by various users. Retrieved information is provided according to the exact demands.

- ❖ **Software:** Software provides the interface between users and the information system. Software can be divided into two types: system software and applications. The system software comprises of the operating system, utility programs and special purpose programs. Applications are developed to accomplish a specific task.
- ❖ **Database:** A database is a centrally controlled collection of organized data. Central control reduces redundancy and duplication of data. Data is stored in an organized and structured way to facilitate sharing and improve availability to those who need it. The database improves efficiency of storage by elimination of redundant files and improves efficiency of processing by providing all required data in a single file rather than separate files. This also improves efficiency of information retrieval.
- ❖ **Procedures:** Three types of procedures are required for an MIS to operate effectively: user instructions, instructions for input preparation and operating instructions for MIS personnel who maintain the MIS.
- ❖ **Personnel:** The personnel include all the people concerned with the MIS in one or the other way. For example, computer operators, programmers, systems analysts and managers. Human resource requirements should be assessed by considering both the present system needs and the future system growth. The quality of MIS personnel is a key factor in its effectiveness. An MIS manager needs a combination of both managerial and technical skills.

## 6.7 FUNCTIONS OF MIS

MIS is set up by an organization with the prime objective to obtain management information to be used by its managers in decision-making. Thus, MIS must perform the following functions in order to meet its objectives.

- ❖ **Data Capturing:** MIS captures data from various internal and external sources of an organization. Data capturing may be manual or through computer terminals. End users, typically record data about transactions on some physical medium such as paper form or enter it directly into a computer system.
- ❖ **Processing of data:** The captured data is processed to convert it into the required management information. Processing of data is done by such activities as calculating, comparing, sorting, classifying and summarizing.
- ❖ **Storage of information:** MIS stores processed or unprocessed data for future use. If any information is not immediately required, it is saved as an organizational record. In this activity, data and information are retained in an organized manner for later use. Stored data is commonly organized into fields, records, files and databases.
- ❖ **Retrieval of information:** MIS retrieves information from its stores as and when required by various users. As per the requirements of the management users, the retrieved information is either disseminated as such or it is processed again to meet the exact demands.