

Introduction of Information System (IS)

An information system is any organized system for the collection, organization, storage and communication of information.

A computer Information System (IS) is a system composed of people and computers that processes or interprets information. The term is also sometimes used in more restricted senses to refer to only the software used to run a computerized database or to refer to only a computer system.

Information system is an academic study of systems with a specific reference to information and the complementary networks of hardware and software that people and organizations use to collect, filter, process, create and also distribute data. An emphasis is placed on an Information System having a definitive Boundary, Users, Processors, Stores, Inputs, Outputs and the aforementioned communication networks.

Any specific information system aims to support operations, management and decision making. An information system is the information and communication technology (ICT) that an organization uses, and also the way in which people interact with this technology in support of business processes.

An Information System is a system that gathers data and disseminates information with the sole purpose of providing information to its users.

The main object of an information system is to provide information to its users. Information systems vary according to the type of users who use the system.

Components of IS

The Components of information system can be explained as below:

1. Hardware:

The term hardware refers to machinery. This category includes the computer itself, which is often referred to as the central processing unit (CPU), and all of its support equipments.

2. Software:

The term software refers to computer programs and the manuals (if any) that support them. Computer programs are machine-readable instructions that direct the circuitry within the hardware parts of the CBIS (Computer based information system) to function in ways that produce useful information from data.

3. Data:

Data are facts that are used by programs to produce useful information. Like programs, data are generally stored in machine-readable form on disk or tape until the computer needs them.

4. Procedures:

Procedures are the policies that govern the operation of a computer system. "Procedures are to people what software is to hardware" is a common analogy that is used to illustrate the role of procedures in CBIS (Computer based information system).

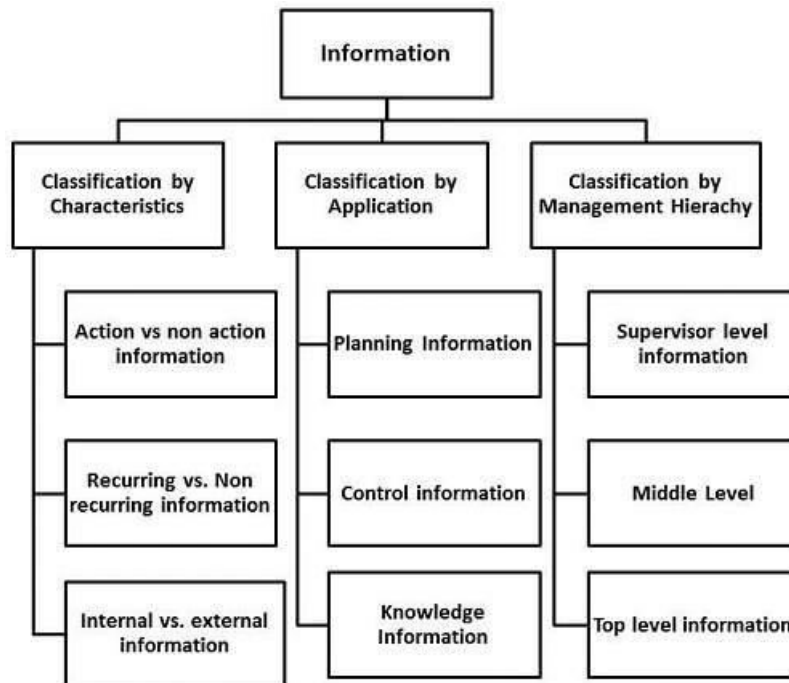
5. People:

Every CBIS needs people if it is to be useful. Often the most over-looked element of the CBIS is the people, probably the component that most influence the success or failure of information systems.

1.1 Types or Classification and evolution of Information System (IS)

1.1.1 Classification of Information System

Information can be classified in a number of ways and the most important ways to classify information.



Classification by Characteristic

Based on Anthony's classification of Management, information used in business for decision-making is generally categorized into three types:

- **Strategic Information:** Strategic information is concerned with long term policy decisions that defines the objectives of a business and checks how well these objectives are met. For example, acquiring a new plant, a new product, diversification of business etc, comes under strategic information.
- **Tactical Information:** Tactical information is concerned with the information needed for exercising control over business resources, like budgeting, quality control, service level, inventory level, productivity level etc.
- **Operational Information:** Operational information is concerned with plant/business level information and is used to ensure proper conduction of specific operational tasks as planned/intended. Various operator specific, machine specific and shift specific jobs for quality control checks comes under this category.

Classification by Application

In terms of applications, information can be categorized as:

- **Planning Information:** These are the information needed for establishing standard norms and specifications in an organization. This information is used in strategic, tactical, and operation planning of any activity. Examples of such information are time standards, design standards.

- **Control Information:** This information is needed for establishing control over all business activities through feedback mechanism. This information is used for controlling attainment, nature and utilization of important processes in a system. When such information reflects a deviation from the established standards, the system should induce a decision or an action leading to control.
- **Knowledge Information:** Knowledge is defined as "information about information". Knowledge information is acquired through experience and learning, and collected from archival data and research studies.
- **Organizational Information:** Organizational information deals with an organization's environment, culture in the light of its objectives. This information is used by everybody in the organization; examples of such information are employee and payroll information.
- **Functional/Operational Information:** This is operation specific information. For example, daily schedules in a manufacturing plant that refers to the detailed assignment of jobs to machines or machines to operators. In a service oriented business, it would be the duty roster of various personnel. This information is mostly internal to the organization.
- **Database Information:** Database information construes large quantities of information that has multiple usage and application. Such information is stored, retrieved and managed to create databases. For example, material specification or supplier information is stored for multiple users.

Information technology is a very important technology in modern business organization handling and decision making in the right time as well as right condition strategically. So, information system leads to the information technology that can be classified as below:

1. Transaction Processing System:

A small business processes transactions that result from day-to-day business operations, such as the creation of paychecks and purchase orders, using a transaction processing system, or TPS. A user enters transaction data by means of a terminal, and the system immediately stores the data in a database and produces any required output.

2. Management Information System:

Small-business managers and owners rely on an industry-specific management information system, or MIS, to get current and historical operational performance data, such as sales and inventories data. Periodically, the MIS can create prescheduled reports, which company management can use in strategic, tactical and operational planning and operations.

3. Decision Support System:

A decision-support system, or DSS, allows small-business managers and owners to use predefined or ad hoc reports to support operations planning and problem-resolution decisions. With DSS, users find answers to specific questions as a means to evaluate the possible impact of a decision before it is implemented.

4. Executive Support System:

The executive support system, or ESS, contains predefined reports that help small-business owners and managers identify long-term trends in support of strategic planning and no routine decision making. The ESS system also offers analysis tools used to predict outcomes assess performance and calculate statistics based on existing data.

5. Office Automation System:

It refers to the varied computer machinery and software used to digitally create, collect, store, manipulate, and relay office information needed for accomplishing basic tasks. Raw data storage, electronic transfer, and the management of electronic business information comprise the basic activities of an office automation system.

6. Expert system:

It is a computer system that emulates the decision-making ability of a human expert. Expert systems are designed to solve complex problems by reasoning about knowledge, represented primarily as if-then rules rather than through conventional procedural code. The first expert systems were created in the 1970s and then proliferated in the 1980s. Expert systems were among the first truly successful forms of AI software.

7. Office Information System:

This system gives the information about the office, enterprise, corporate and firm. It is always responsible for the providing the information to the known and unknown user and employee.

8. Integrated Information System:

It is a collection of information system that can be also called as package which is the combination of the information system. It is responsible for the organization to help the integrated information for the decision making and analysis.

9. Communication and Collaboration System:

Communication refers to the exchanging of information between the users, organization and employee while collaboration refers to the partnership between the organizations having different goal but they can use the communication and collaboration system.

10. Knowledge Management System:

“Right man in right job and right decision in right time” can be called as knowledge management. So there are so many organizations that can use the knowledge management system which is used to manage the knowledge.

1.1.2 Evolution of Information System (IS)

Data is a raw material from which the meaningful and desired information can be obtained by using the system called as information system. The information system only derived from the data and information for the logical and decision making.

Management information system is a one kind of information system that can be used only for the analysis, manage, control and decision making on the processed data or collection of information. So MIS is computer based software that can be used only for the decision making at right time.

The information system is derived by the Silver at el @ 1995 which defines the data, information, system and information system. After the needed of desired and right result there was use of computer based software called slightly information system.

After the evolution of information system, then the information system was more useful for the enterprise and any firm. So the Zheng was developed the concept of computer based system that was used for that financial tools. After the evolution of concept of MIS then the company ACM (Association of Computer Machinery) maintain the standards of information system as well as management information system.

1.2 Information Technology

Information technology (IT) is any computer-based tool that people use to work with information and support the information and information-processing needs of an organization. All technology is either hardware or software.

Role and goal of information technology in new business

The roles and goals of IT include

- Increase employee productivity: Reducing the time, errors and costs associated with processing information.
- Enhance decision making- helping you analyze a situation and then leaving the decision entirely up to you or actually making some sort of recommendation concerning what to do
- Improve team collaboration- improving the performance of teams by supporting the sharing and flow of information.
- Create business partnership and alliances- helping organizations work together to provide better and timelier products and services.
- Enable global reach- Marketing your products and services in countries all over the world and developing partnerships and alliances with other businesses throughout the globe.
- Facilitate organizational transformation- Responding to the ever-changing needs of today's marketplace.

Information, a new key business resource

Information is a data that have a particular meaning within a specific context. It is a new key business resource because:

- It is one of the key components of the management information system along with information technology and people.
- We are in the information age, a time when knowledge is power. And knowledge comes from having timely access to information and knowing what to do with it.

1.3 Dimensions of information

The personal and organizational dimensions of information include

1. **Personal Dimension:** since knowledge worker works with and produce information, while working with it they can consider it three points of view or dimensions:
 1. **Personal-** Access to information when you need it and information that describes the time period you're considering.
 2. **Time-** Access the information no matter where you are.

3. **Form-** Information in a form that is most usable and understandable (audio, text, video, animation, graphical and others) and information that is free of errors.

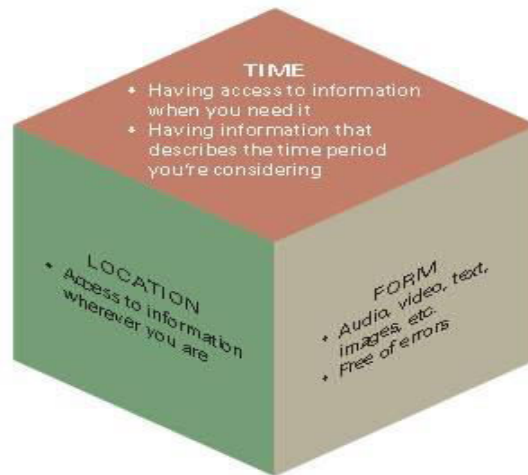


Fig: Personal dimension of information

2. **Organizational Dimension:** To run the business smoothly and efficiently, we have to consider various organizational dimensions of information. These include:
 1. **Information flows:** Up, down, horizontal and outward with respect to an organization.
 2. **Granularity:** The extent of detail within information.
 3. **What information describes:**
 - **Internal-** Specific organizational aspects of the organization,
 - **External-** The environment surrounding the organization,
 - **Objective-** Quantifiably describing something that is known and
 - **Subjective-** Attempting to describes something that is unknown

1.4 Information System in functional area

Information Systems have a number of different areas of work:

- IS strategy
- IS management
- IS development
- IS iteration
- IS organization

There is a wide variety of career paths in the information systems discipline. "Workers with specialized technical knowledge and strong communications skills will have the best prospects. Workers with management skills and an understanding of business practices and principles will have excellent opportunities, as companies are increasingly looking to technology to drive their revenue.

Information technology is important to the operation of contemporary businesses, it offers many employment opportunities. The information systems field includes the people in organizations who design and build information systems, the people who use those systems, and the people responsible for managing those systems.

It supports a functional area by increasing its internal effectiveness and efficiency. Typically found for:

- Finance (FIN): provide internal and external professional access to stock, investment and capital spending information.
- Accounting (ACC): similar to financial MIS more related to invoicing, payroll, receivables.
- Marketing (MKT): pricing, distribution, promotional, and information by customer and salesperson.
- Operations (OPS): regular reports on production, yield, quality, inventory levels. These systems typically deal with manufacturing, sourcing, and supply chain management.
- Human Resources Management (HR): employees, benefits, hiring, etc.

A summary of capabilities of a FAIS are organized by functional area in the following chart:

Profitability Planning	Financial Planning	Employment Planning, Outsourcing	Product Life Cycle Management	Sales Forecasting, Advertising Planning
Auditing, Budgeting	Investment Management	Benefits Administration, Performance Evaluation	Quality Control, Inventory Management	Customer Relations, Sales Force Automation
Payroll, Accounts Payable, Accounts Receivable	Manage Cash, Manage Financial Transactions	Maintain Employee Records	Order Fulfillment, Order Processing	Set Pricing, Profile Customers
ACCOUNTING	FINANCE	HUMAN RESOURCES	PRODUCTION/ OPERATIONS	MARKETING

1.5 Information System Architecture

Information system architecture is a formal definition of the business processes and rules, systems structure, technical framework, and product technologies for a business or organizational information system. Information system architecture usually consists of four layers: business process architecture, systems architecture, technical architecture, and product delivery architecture.

The architecture of an information system encompasses the hardware and software used to deliver the solution to the final consumer of services. The architecture is a description of the design and contents of a computerized system. If documented, the architecture may include information such as a detailed inventory of current hardware, software and networking capabilities; a description of long-range plans and priorities for future purchases, and a plan for upgrading and/or replacing dated equipment and software. The architecture should document: What data is stored?, How does the system function?, Where are components located?, When do activities and events occur in the system?, and Why does the system exist?

Information systems architecture is an integral part of Architecture and strategic planning. A technical blueprint of the company, when aligned with the business components, helps in processing and sharing relevant information across the board. It helps companies to respond to changes in business and technology quickly and also helps reducing costs because of economies of scale and sharing of resources.

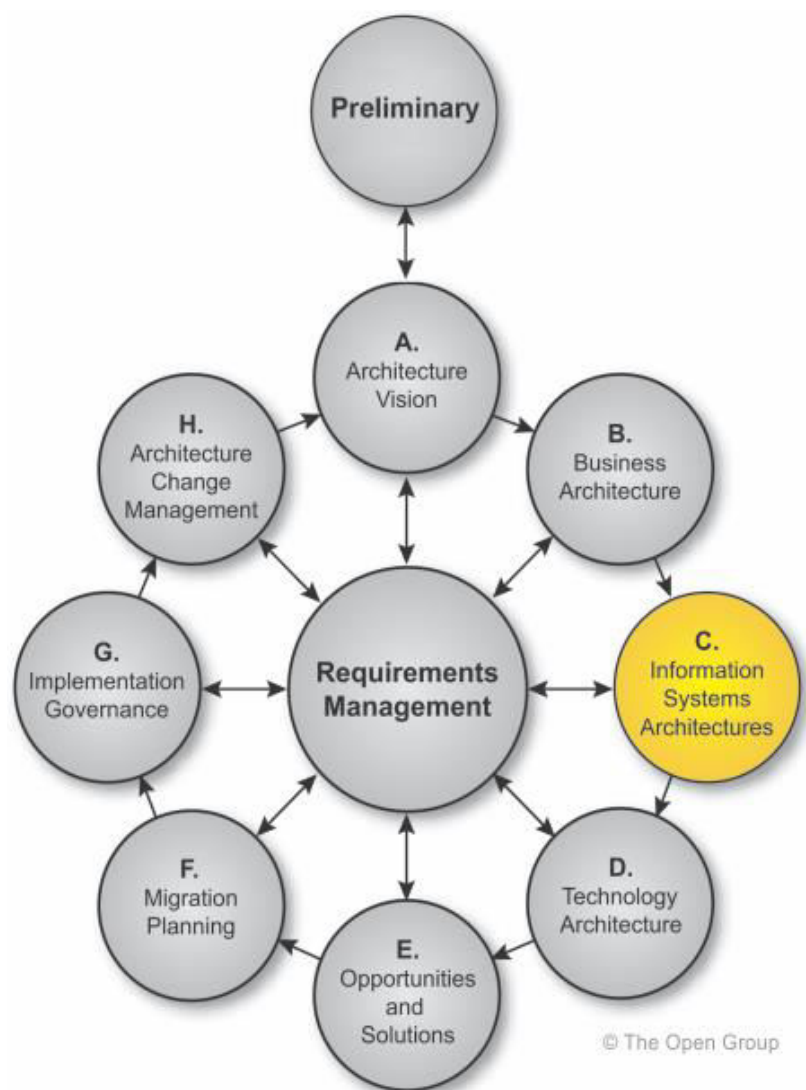


Fig: Architectural design of Information system

1.6 Qualities of Information Systems

The purpose of an information system is to help executives of an organization make decisions that advance the organization's goals. The most important characteristics of MIS are those that give decision-makers confidence that their actions will have the desired consequences.

1. Usefulness:

The information a manager receives from MIS may be relevant and accurate, but it is only useful if it helps him with the particular decisions he has to make. For example, if a manager has to make decisions on which employees to cut due to staff reductions, information on resulting cost savings is relevant, but information on the performance of the employees in question is more useful.

2. Timeliness:

MIS output must be current. Management has to make decisions about the future of the organization based on data from the present, even when evaluating trends. The more recent the data the more these decisions will reflect present reality and correctly anticipate their effects on the company.

3. Completeness:

An effective MIS presents all the most relevant and useful information for a particular decision. If some information is not available due to missing data, it highlights the gaps and either displays possible scenarios or presents possible consequences resulting from the missing data.

4. Accuracy:

Management information systems are accurate and provide up-to-date and correct information based on factual data. All processed information derived from an accurate and correct management information system is typically free of flaws, consistent and complete.

5. Integrated:

Organizations are involved in various functions and sub-functions, such as manufacturing, finance, human resources, marketing and other specialized areas. A management information system is an integrated collection of information systems, each designed to support a unique functional area.

6. Available:

Information may be useless if it is not readily accessible 'in the desired form, when it is needed. Advances in technology have made information more accessible today than ever before.

7. Reliable:

The information should be counted on to be trustworthy. It should be accurate, consistent with facts and verifiable. Inadequate or incorrect information generally leads to decisions of poor quality. For example, sales figures that have not been adjusted for returns and refunds are not reliable.

8. Cost-effective:

The information is not desirable if the solution is more costly than the problem. The cost of gathering data and processing it into information must be weighed against the benefits derived from using such information.

9. Control database:

Another important characteristic of MIS is that it always based on centralized data and information. It is because of this fact that MIS is to supply data and information in such a way so that the management can take its important decision.

Information is a vital resource for the success of any organization. Future of an organization lies in using and disseminating information wisely. Good quality information placed in right context in right time tells us about opportunities and problems well in advance. Good quality information: Quality is a value that would vary according to the users and uses of the information. According to Wang and Strong, following are the dimensions or elements of Information Quality:

- **Intrinsic:** Accuracy, Objectivity, Believability, Reputation
- **Contextual:** Relevancy, Value-Added, Timeliness, Completeness, Amount of information
- **Representational:** Interpretability, Format, Coherence, Compatibility
- **Accessibility:** Accessibility, Access security

1.7 Managing Information System Resources

There are many kinds of information systems in the real world. All of them use hardware, software, network, and people resources to transform data resources into information products.

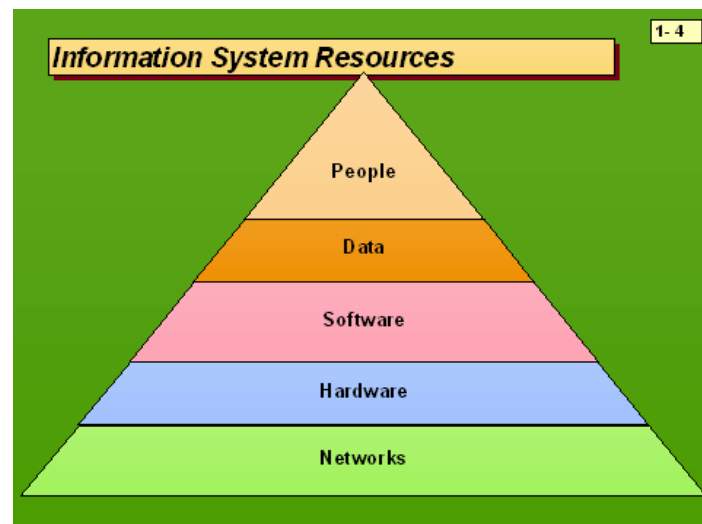


Fig: information system resources

1. People Resources

People are required for the operation of all information systems. This people resource includes end users and IS specialists.

End users: Also called users or clients are people who use an information system or the information it produces. They can be accountants, salespersons, engineers, clerks, customers, or managers. Most of us are information system end users.

IS Specialists are people who develop and operate information systems. They include systems analysts, programmers, computer operators, and other managerial technical, and clerical IS personnel. Briefly, systems analysts design information systems based on the information requirements of end users, programmers prepare computer programs based on the specifications of systems analysts, and computer operators operate large computer systems.

2. Data Resources

Data is more than the raw material of information systems. The concept of data resources has been expanded by managers and information systems professionals. They realize that data constitutes a valuable organization resource. Thus, you should view data as data resources that must be managed effectively to benefit all end users in an organization. Data can take many forms, including traditional alphanumeric data, Text data, image data, and audio data.

3. Software Resources

The concept of Software Resources includes all sets of information processing instructions. This concept of software includes not only the sets of operating instructions called programs, which direct and control computer hardware, but also the sets of information processing instructions needed by people, called procedures.

4. Hardware Resources

The concept of **Hardware resources** includes all physical devices and materials used in information processing. Specially, it includes not only **machines**, such as computers and other equipment, but also all data **media**, that is, all tangible objects on which data is recorded, from sheets of paper to magnetic disks.

5. Network Resources

Telecommunications networks like the Internet, intranets, and extranets have become essential to the successful operations of all types of organizations and their computer-based information systems. Telecommunications networks consist of computers, communications processors, and other devices interconnected by communications media and controlled by communications software. The concept of Network resources emphasizes that communications networks are a fundamental resource component of all information systems. Network resources include:

- **Communication media**, Examples include twisted pair wire, coaxial cable, fiber-optic cable, microwave systems, and communication satellite systems.
- **Network Support**, This category includes all of the people, hardware, software, and data resources that directly support the operation and use of a communications network. Examples include communications control software such as network operating systems and Internet packages.

1.8 Balanced Scorecard- Case studies

Introduction

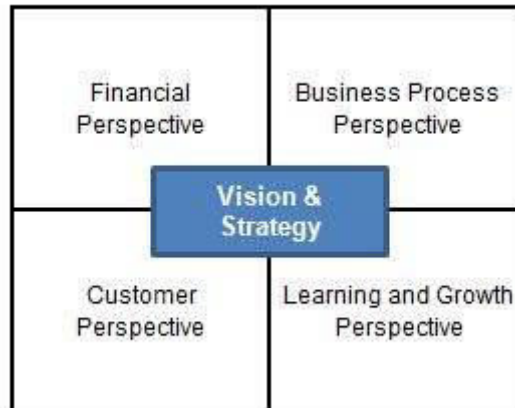
The balance scorecard is used as a strategic planning and a management technique. This is widely used in many organizations, regardless of their scale, to align the organization's performance to its vision and objectives.

The scorecard is also used as a tool, which improves the communication and feedback process between the employees and management and to monitor performance of the organizational objectives.

As the name depicts, the balanced scorecard concept was developed not only to evaluate the financial performance of a business organization, but also to address customer concerns, business process optimization, and enhancement of learning tools and mechanisms.

The Basics of Balanced Scorecard

Following is the simplest illustration of the concept of balanced scorecard. The four boxes represent the main areas of consideration under balanced scorecard. All four main areas of consideration are bound by the business organization's vision and strategy.



The balanced scorecard is divided into four main areas and a successful organization is one that finds the right balance between these areas.

Each area (perspective) represents a different aspect of the business organization in order to operate at optimal capacity.

- **Financial Perspective** - This consists of costs or measurement involved, in terms of rate of return on capital (ROI) employed and operating income of the organization.
- **Customer Perspective** - Measures the level of customer satisfaction, customer retention and market share held by the organization.
- **Business Process Perspective** - This consists of measures such as cost and quality related to the business processes.
- **Learning and Growth Perspective** - Consists of measures such as employee satisfaction, employee retention and knowledge management.

The four perspectives are interrelated. Therefore, they do not function independently. In real-world situations, organizations need one or more perspectives combined together to achieve its business objectives.

For example, Customer Perspective is needed to determine the Financial Perspective, which in turn can be used to improve the Learning and Growth Perspective.

Features of Balanced Scorecard

From the above diagram, you will see that there are four perspectives on a balanced scorecard. Each of these four perspectives should be considered with respect to the following factors.

When it comes to defining and assessing the four perspectives, following factors are used:

- **Objectives** - This reflects the organization's objectives such as profitability or market share.
- **Measures** - Based on the objectives, measures will be put in place to gauge the progress of achieving objectives.
- **Targets** - This could be department based or overall as a company. There will be specific targets that have been set to achieve the measures.
- **Initiatives** - These could be classified as actions that are taken to meet the objectives.

A Tool of Strategic Management

The objective of the balanced scorecard was to create a system, which could measure the performance of an organization and to improve any back lags that occur.

The popularity of the balanced scorecard increased over time due to its logical process and methods. Hence, it became a management strategy, which could be used across various functions within an organization.

The balanced scorecard helped the management to understand its objectives and roles in the bigger picture. It also helps management team to measure the performance in terms of quantity. The balanced scorecard also plays a vital role when it comes to communication of strategic objectives.

One of the main reasons for many organizations to be unsuccessful is that they fail to understand and adhere to the objectives that have been set for the organization.

The balanced scorecard provides a solution for this by breaking down objectives and making it easier for management and employees to understand. Planning, setting targets and aligning strategy are two of the key areas where the balanced scorecard can contribute. Targets are set out for each of the four perspectives in terms of long-term objectives.

However, these targets are mostly achievable even in the short run. Measures are taken in align with achieving the targets. Strategic feedback and learning is the next area, where the balanced scorecard plays a role. In strategic feedback and learning, the management gets up-to-date reviews regarding the success of the plan and the performance of the strategy.

The Need for a Balanced Scorecard

Following are some of the points that describe the need for implementing a balanced scorecard:

- Increases the focus on the business strategy and its outcomes.
- Leads to improvised organizational performance through measurements.
- Align the workforce to meet the organization's strategy on a day-to-day basis.
- Targeting the key determinants or drivers of future performance.
- Improves the level of communication in relation to the organization's strategy.
- Helps to prioritize projects according to the timeframe and other priority factors.

Conclusion

As the name denotes, balanced scorecard creates a right balance between the components of organization's objectives and vision.

It's a mechanism that helps the management to track down the performance of the organization and can be used as a management strategy.

It provides an extensive overview of a company's objectives rather than limiting itself only to financial values. This creates a strong brand name amongst its existing and potential customers and a reputation amongst the organization's workforce.

Question no 1: Why any firm use the balanced scorecard for the performance management?

Question 2: Differentiate between the balanced scorecard and Dash Board.

Question 3: Does Visionary concept will be arising by the balanced scorecard?