1

BASIC INFORMATION CONCEPTS AND DEFINITION

Unit Structure

1.0 OBJECTIVES

- Know and be able to differentiate among the four types of organizational structure.
- Understand why a change in structure may be needed.
- System definition
- Topology of information system
- Characteristics of information
- Decision Making information System

1.1 INTRODUCTION

According to Russell Ackoff a systems theorist and professor of organizational change, the content of the human mind can be classified into three categories:

Data represents a fact or an event statement unrelated to other things. Data is generally used regarding hard facts. This can be a mathematical symbol or text used to identify, describe, or represent something like temperature or a person. The data simply exists and has no meaning beyond its existence (in itself). It can exist in any form, usable or not. The data exists in different formats, such as text, image, sound, or even video.

Information is data combined with meaning. Information embodies the understanding of a relationship as the relationship between cause and effect [2]. Ex: The temperature dropped 15 degrees, then it started to rain. A temperature reading of 100 can have different meanings when combined with the term Fahrenheit or with the term Celsius. More semantics can be added if more context for the temperature read is added, such as the fact that this temperature concerns a liquid or a gas or the seasonal norm of 20°. In other words, information is data that has meaning through relational connection. According to Ackoff, information is useful data; it provides answers to the questions: "who," "what," "where," and "when."

Knowledge can be seen as information combined with experience, context, and interpretation. Knowledge constitutes an additional semantic level derived from information via a process. Sometimes this process is observational. Ackoff defines it as applying data and information; knowledge provides answers to the question "how" For example, what happens in cold weather for aircraft managers? Observational knowledge engineers interpret cold by its impact, which is the ice that can form on an aircraft by reducing aerodynamic thrust and potentially hampering the performance of its control surfaces [2].

IF temperature < = 0° C THEN cold = true;

Cold IF == right THEN notify personnel to remove ice from aircraft.

Indeed, knowledge is the appropriate collection of information such that it intends to be useful. Knowledge is a deterministic process. Memorization of information leads to knowledge. Knowledge represents a pattern and provides a high level of predictability regarding what is being described or will happen next.

Ex: If the humidity is very high and the temperature drops drastically, the atmosphere is unlikely to hold the humidity so that it rains.

This knowledge has a useful meaning, but its integration in a context will infer new knowledge. For example, a student memorizes or accumulates knowledge of the multiplication Table. A student can answer 2 × 2 because this knowledge is in the multiplication table. Nevertheless, when asked for 1267 × 300, he cannot answer correctly because he cannot dip

into the multiplication table. To answer such a question correctly requires a real cognitive and analytical capacity that exists in the next level … comprehension. In computer jargon, most of the applications we use (modelling, simulation, etc.) use stored knowledge.

1.3 SYSTEM DEFINITION

The system is an aggregated "whole" where each component interacts with at least one other component of the system. The components or parts of a system can be real or abstract.

All system components work toward a standard system goal. A system can contain several subsystems. It can be connected to other systems.

A system is a collection of elements or components that interact to achieve goals. The elements themselves and the relationships between them determine how the system works. Systems have inputs, processing mechanisms, outputs, and feedback mechanisms. A system processes the input to create the output [3].

Input is the activity of collecting and capturing data.

Processing involves the transformation of inputs into outputs such as computation, for example.

Output is about producing useful information, usually in the form of documents and reports. The output of one system can become the input of another system. For example, the output of a system, which processes sales orders, can be used as input to a customer's billing system. Computers typically produce output to printers and display to screens. The output can also be reports and documents written by hand or produced manually.

Finally, feedback or feedback is information from the system used to modify inputs or treatments as needed.

1.4 INFORMATION SYSTEM DEFINITION

An information system (IS) is a set of interrelated components that collect, manipulate, store and disseminate information and provide a feedback mechanism to achieve a goal. The feedback mechanism helps organizations achieve their goals by increasing profits, improving customer service [3], and supporting decision-making and control in organizations [4].

Companies use information systems to increase revenues and reduce costs.

In organizations, information systems are structured around four essential elements, proposed in the 1960s by Harold Leavitt (Figure 1). The pattern is known as the "Leavitt Diamond."

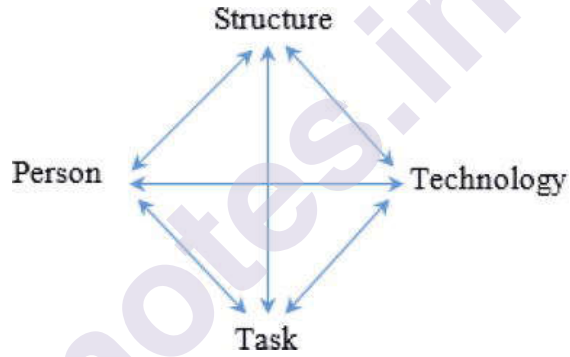
Technology: The IT (Information Technology) of an IS includes the hardware, software,

and telecommunications equipment used to capture, process, store and disseminate information. Today, most IS are IT-based because modern IT enables efficient operations execution and effective management in all sizes.

Task: activities necessary for the production of a good or service. These activities are supported by the flow of material, information, and knowledge between the different participants.

Person: The people component of an information system encompasses all the people directly involved in the system. These people include the managers who define the goals of the system, the users, and the developers.

Structure: The organizational structure and information systems component refers to the relationship between individuals people components. Thus, it encompasses hierarchical structures, relationships, and systems for evaluating people.



1.4.1 Typology of information systems

A company has systems to support the different managerial levels. These systems include transaction processing systems, management information systems, decision support systems, and dedicated business intelligence systems.

Companies use information systems so that accurate and up-to-date information is available when needed [5].

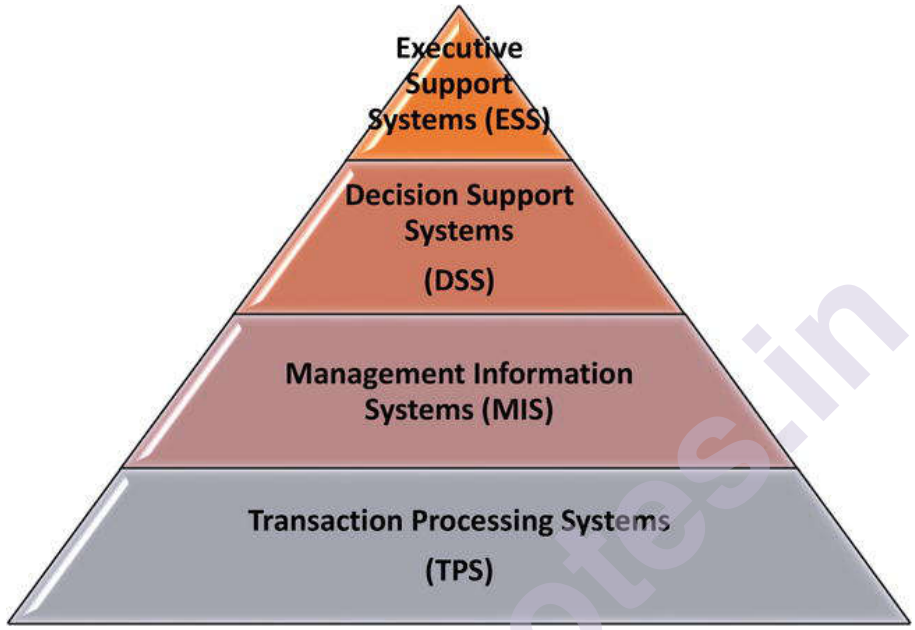
Within the same organization, executives at different hierarchy levels have very different information requirements, and different types of information systems have evolved to meet their needs. A common approach for examining the types of information systems used within organizations is to classify them according to their roles at different organizational structure levels, and this approach is called a vertical approach. Indeed, the organization is considered a management pyramid at four levels (Figure 2):

On the lowest level, staff perform routine day-to-day operations such On the lowest level, staff perform routine day-to-day operations such as selling goods and issuing payment receipts.

Operational management in which managers are responsible for overseeing transaction control and deal with issues that may arise.

Tactical management, which has the prerogative of making decisions on budgets, setting objectives, identifying trends, and planning short-term business activities.

Strategic management is responsible for defining its long-term objectives and positioning concerning its competitors or its industry.



1.4.2 Transaction processing system (TPS)

At the operational level, managers need systems that keep track of the organization for necessary activities and operations, such as sales and material flow in a factory. A transaction processing system is a computer system that performs and records the routine (daily) operations necessary for managing affairs, such as keeping employee records, payroll, shipping merchandise, keeping records, accounting and treasury.

At this level, the primary purpose of systems is to answer routine questions and monitor transactions flow through the organization.

At the operational level, tasks, resources, and objectives are predefined and highly structured. The decision to grant credit to a customer, for example, is made by a primary supervisor according to predefined criteria. All that needs to be determined is whether the client meets the criteria.

Management information systems (MIS)

Middle managers need systems to help with oversight, control, decision making, and administrative activities. The main question that this type of system must answer is: is everything working correctly?

Its role is to summarize and report on essential business operations using data provided by transaction processing systems. Primary transaction data

is synthesized and aggregated, and it is usually presented in reports produced regularly.

1.4.3 Decision support systems (DSS)

DSS supports decision-making for unusual and rapidly evolving issues, for which there are no fully predefined procedures. This type of system attempts to answer questions such as: What would impact production schedules if we were to double sales for December? What would the level of Return on investment be if the plant schedule were delayed by more than six months?

While DSSs use internal information from TPS and MIS systems, they also leverage external sources, such as stock quotes or competitor product prices. These systems use a variety of models to analyze the data. The system can answer questions such as: Considering customer's delivery schedule and the freight rate offered, which vessel should be assigned, and what fill rate to maximize profits? What is the optimum speed at which a vessel can maximize profit while meeting its delivery schedule?

1.4.4 Executive support system (ESS)

ESS helps top management make decisions. They address exceptional decisions requiring judgment, assessment, and a holistic view of the business situation because there is no procedure to be followed to resolve a given issue at this level.

ESS uses graphics and data from many sources through an interface that senior managers easily understand. ESS is designed to integrate data from the external environment, such as new taxes or competitor data, and integrate aggregate data from MIS and DSS. ESSs filter, synthesize and track critical data. Particular attention is given to displaying this data because it contributes to the rapid assimilation of these top management figures. Increasingly, these systems include business intelligence analysis tools to identify key trends and forecasts.

1.5 DECISION MAKING AND INFORMATION SYSTEMS

Decision-making in companies is often associated with top management. Today, employees at the operational level are also responsible for individual decisions since information systems make information available at all company levels.

So decisions are made at all levels of the company.

Although some of these decisions are common, routine, and frequent, the value of improving any single decision may be small, but improving hundreds or even thousands of "small" decisions can add value to the business. Not all situations that require decisions are the same. While some decisions result in actions that significantly impact the organization and its future, others are much less important and play a relatively minor

role. A decision's impact is a criterion that can differentiate between decision situations and the degree of the decision's structuring. Many situations are very structured, with well-defined entrances and exits. For example, it is relatively easy to determine the amount of an employee's pay if we have the appropriate input data (for example, the number of hours worked and their hourly wage rate), and all the rules of relevant decision (for example, if the hours worked during a week are more than 40, then the overtime must be calculated), and so on. In this type of situation, it is relatively easy to develop information systems that can be used to help (or even automate) the decision.

In contrast, some decision situations are very complex and unstructured, where no specific decision rules can be easily identified. As an example, consider the following task: "Design a new vehicle that is a convertible (with a retractable hardtop), has a high safety rating, and is esthetically pleasing to a reasonably broad audience. No predefined solution to this task finalizing a design will involve many compromises and require considerable knowledge and expertise.

Examples of Types of decisions, according to managerial level, are presented in Table 1.

Decision level	Characteristics of decisions	Examples of decisions
Top Management	Unstructured	Decide whether or not to come into the market
		Approve the budget allocated to capital
		Decide on long-term goals
Intermediate management	Semi-structured	Design a marketing plan
		Develop a departmental budget
		Design a website for the company
Operational management	Structured	Determine the overtime hours
		Determine the rules for stock replenishment
		Grant credit to customers
		Offer special offers to customers

1.5.1 Creating an Organizational Structure

Within most firms, executives rely on vertical and horizontal linkages to create a structure that they hope will match the needs of their firm's strategy. Four types of structures are available to executives: (1) simple, (2) functional, (3) multidivisional, and (4) matrix ("Common Organizational Structures"). Like snowflakes, however, no two organizational structures are exactly alike. When creating a structure for their firm, executives will take one of these types and adapt it to fit the firm's unique circumstances. As they do this, executives must realize that the choice of structure will influence their firm's strategy and strategic options in the future. Once a structure is created, it constrains certain future strategic moves, and supports others. If a firm's structure is designed to maximize efficiency, for example, the firm may lack the flexibility needed to react quickly to exploit new opportunities.

Figure : Common Organizational Structures

Executives rely on vertical and horizontal linkages to create a structure that they hope will match the firm's needs. While no two organizational structures are exactly alike, four general types of structures are available to executives: simple, functional, multidivisional, and matrix.

Simple Structure	Simple structures do not rely on formal systems of division of labor, and organizational charts are not generally needed. If the firm is a sole proprietorship, one person performs all of the tasks that the organization needs to accomplish. Consequently, this structure is common for many small businesses.
Functional Structure	Within a functional structure, employees are divided into departments that each handles activities related to a functional area of the business, such as marketing, production, human resources, information technology, and customer service.
Multidivisional Structure	In this type of structure, employees are divided into departments based on product areas and/or geographic regions. Jim Pattison Group, for example, has nine product divisions; Food and Beverage, Media, Entertainment, Automotive and Agriculture, Periodical Distribution and Marketing, Signs, Packaging, Forest Products and Port Service, and Investments and Partnerships.

Matrix Structure	Firms that engage in projects of limited duration often use a matrix structure where employees can be put on different teams to maximize creativity and idea flow. As parodied in the movie Office Space, this structure is common in high tech and engineering firms.

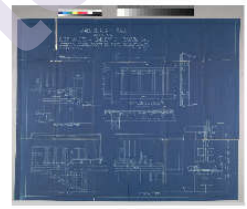
1.5.2 Simple Structure

Many organizations start out with a simple structure. In this type of structure, an organizational chart is usually not needed. Simple structures do not rely on formal systems of division of labour. If the firm is a sole proprietorship, one person performs all the tasks the organization needs to accomplish. Many professions, such as doctors, lawyers, and architects, find that a simple structure meets the needs of their business. The same is true for small business owners; for example, on the TV series The Simpsons, both bar owner Moe Szyslak and Comic Book Guy are shown handling all aspects of their respective businesses.

Most small businesses begin with a simple structure where one person or a small set of people share the tasks needed to accomplish the firm's goals with relatively little formalized division of labor. We illustrate a number of businesses that commonly rely upon a simple structure below.

Need a few dollars to tide you over? You may want to pawn your rare coin collection. The pawn shop's simple structure will mean that the same person values your coins, decides how much money you can borrow, and writes up your paperwork.

The reality show *Tattoo Nightmares* illustrates how a tattoo parlour's simple structure governs a colourful set of tattoo artists who create body art for their patrons.



Architects often also act as marketers and accountants when drafting their small business plans.

Bait shop owners generally do not dive deep into their pockets to pay for additional personnel as many are owner operated.

When a dry cleaner is family owned as many are, all members of the family pitch in as needed to clean clothing and wait on customers.

There is flexibility in the management of many yoga studios given the laid back management style often embraced.

Instrument dealers may create beautiful music, but they rarely create complex organizational structures.

"Bridezillas" are an occupational hazard for bridal shops, but these shops are generally able to avoid the complexity associated with other organizational structures.

If the firm consists of more than one person, tasks tend to be distributed among them in an informal manner rather than each person developing a narrow area of specialization. In a family-run restaurant or bed and breakfast, for example, each person will contribute as needed to tasks, such as cleaning restrooms, food preparation, and serving guests (hopefully not in that order). Meanwhile, strategic decision making in a simple structure tends to be highly centralized. Indeed, often the owner of the firm makes all the important decisions. Because there is little emphasis on hierarchy within a simple structure, organizations that use this type of structure tend to have very few rules and regulations. The process of evaluating and rewarding employees' performance also tends to be informal.

The informality of simple structures creates both advantages and disadvantages. On the plus side, the flexibility offered by simple structures encourages employees' creativity and individualism. Informality has potential negative aspects, too. Important tasks may be ignored if no one person is specifically assigned accountability for them. A lack of clear guidance from the top of the organization can create confusion for employees, undermine their motivation, and make them dissatisfied with their jobs. Thus when relying on a simple structure, the owner of a firm must be sure to communicate often and openly with employees.

1.5.3 Functional Structure

As a small organization grows, the person in charge of it often finds that a simple structure is no longer adequate to meet the organization's needs. Organizations become more complex as they grow, and this can require more formal division of labour and a strong emphasis on hierarchy and vertical links. In many cases, these firms evolve from using a simple structure to relying on a functional structure.

Functional structures rely on a division of labor whereby groups of people handle activities related to a specific function of the overall business. We illustrate functional structures in action within two types of organizations that commonly use them.

Grocery Store Functions

Grocery stockers often work at night to make sure shelves stay full during the day.

Pharmacists' specialized training allows them to command pay that can exceed $50 an hour.

Bakers wake up early to give shoppers their daily bread.

Bagging groceries requires a friendly personality as well as knowing that eggs should not go on the bottom.

Folks that work checkout aisles should be trusted to handle cash.

The creation of produce, deli, and butcher departments provides an efficient way to divide a grocery store physically as well as functionally.

Spa Functions

Some spa employees manicure fingernails, a practice that is over four thousand years old. Many also provide pedicures, a service whose popularity has nearly doubled in the past decade.

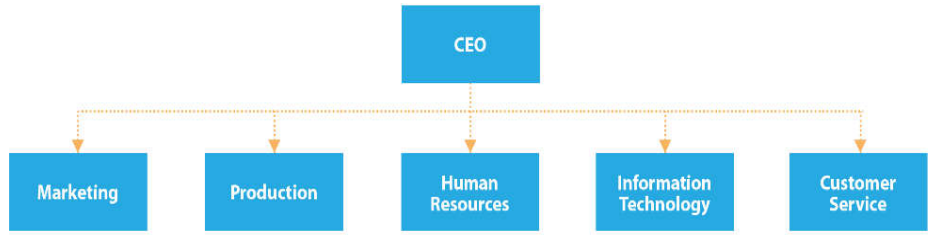
Compared to other spa functions, little training is required of a tanning bed operator—although the ability to tell time may help.

Almost anyone can buy a shotgun or parent a child without any training, but every state requires a license in order to cut hair.

Cucumber masks are usually applied by a skin care specialist who has taken a professional training program.

The license required of massage therapists in many provinces ensures that spa visits end happily.

Within a functional structure, employees are divided into departments that each handle activities related to a functional area of the business, such as marketing, production, human resources, information technology, and customer service (Figure 9.9 "Functional Structure"). Each of these five areas would be headed up by a manager who coordinates all activities related to her functional area. Everyone in a company that works on marketing the company's products, for example, would report to the manager of the marketing department. The marketing managers and the managers in charge of the other four areas in turn would report to the chief executive officer.



using a functional structure creates advantages and disadvantages. An important benefit of adopting a functional structure is that each person tends to learn a great deal about his or her particular function. By being placed in a department that consists entirely of marketing professionals, an individual has a great opportunity to become an expert in marketing. Thus a functional structure tends to create highly skilled specialists. Second, grouping everyone that serves a particular function into one department tends to keep costs low and create efficiencies. Also, because all the people in a particular department share the same background training, they tend to get along with one another. In other words, conflicts within departments are relatively rare.

1.5.4 Multidivisional Structure

Many organizations offer a wide variety of products and services. Some of these organizations sell their offerings across an array of geographic regions. These approaches require firms to be responsive to local customers' needs. Yet, as noted, functional structures tend to be fairly slow to change. As a result, when they expand, many firms abandon the use of a functional structure as no longer optimal for their larger size. Often the new choice is a multidivisional structure. In this type of structure, employees are divided into departments based on products, services, and/or geographic regions.

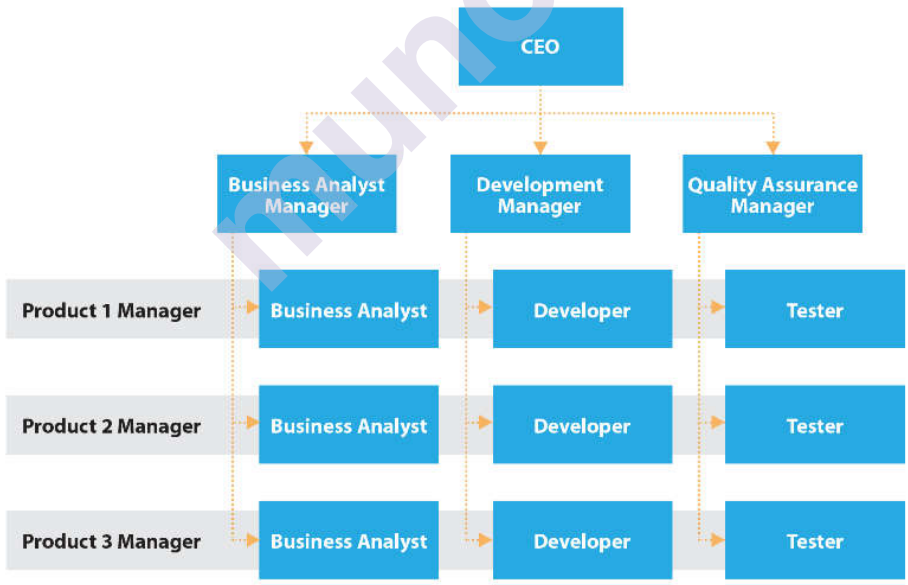
In the multidivisional form, the firm is divided into semi-autonomous divisions that have their own support (corporate) structures with each division being responsible for its own production and maximizing its own profit. The firm still has a central office that oversees the other divisions but the central office's main responsibility is to develop overall strategies for the business, not to be responsible for each division's operations.

A big advantage of a multidivisional structure is that it allows a firm to act quickly. When Jim Pattison Group made a strategic move such as acquiring Ocean Foods, only the relevant division (in this case, Food and Beverage) needed to be involved in integrating the new unit into the company's hierarchy. In contrast, if the Group was organized using a functional structure, the transition would be much slower because all the divisions in the company would need to be involved. A multidivisional structure also helps an organization better serve customers'

1.5.5 Matrix Structure

Within functional and multidivisional structures, vertical linkages between bosses and subordinates are central for decision making, communications, and accountability. Matrix structures, in contrast, rely heavily on horizontal relationships (Ketchen& Short, 2011). In particular, these structures create cross-functional teams that each work on a different project. This offers several benefits: maximizing the organization's flexibility, enhancing communication by emphasizing both vertical (top-down) and horizontal communications across functional lines, and supporting a stronger spirit of teamwork and collaboration. A matrix structure can also help develop new managers. In particular, a person with limited managerial experience can become a team leader for a relatively small project in developing their talents for leading others.

Using a matrix structure can create difficulties too. One concern is that using a matrix structure violates the unity of command principle because each employee is assigned multiple bosses. Specifically, any given individual reports to a functional area supervisor as well as one or more project supervisors. This has the potential to create confusion for employees because they are left unsure about who should be giving them direction, especially in setting priorities for their work. Violating the unity of command principle also creates opportunities for unsavory employees to avoid responsibility by claiming to be busy on the other supervisor's projects.



Within a matrix structure, you will have multiple bosses, which contradicts the rule of direct chain of command. [Image description]

1.6 REASONS FOR CHANGING AN ORGANIZATION'S STRUCTURE

Creating an organizational structure is not a one-time activity. Executives must revisit an organization's structure over time and make changes to it if certain danger signs arise. For example, a structure might need to be adjusted if decisions with the organization are being made too slowly or if the organization is performing poorly.

In 2014, Walmart Canada confirmed that it laid off 750 employees across Canada to re-work its management structure. According to the company, after testing a new management structure in select stores, 1,300 associates were promoted to more senior roles and about 200 senior managers were added.

Procter and Gamble, the world's largest consumer products manufacturer, announced in 2014 that it may sell off its iconic Ivory soap brand. A range of reports pegged Ivory's 2013 global revenues at $112 million, and its share of the U.S. bar soap market at 3.4 percent. Even though Ivory maintains a high profile, it has retreated significantly from its highs of past decades, and it may be considered an expendable laggard among the high-performance product mix that P&G's CEO wants to create. P&G is being trimmed to concentrate on the seventy to eighty brands that generate more than $100 million in gross annual revenues. Ivory is just above that cutline, and projections do not call for growth.

1.7 POINTS TO REMEMBER

- Executives must select among the four types of structure (simple, functional, multidivisional, and matrix) available to organize operations. Each structure has unique advantages, and the selection of structures involves a series of trade-offs.
- ESS uses graphics and data from many sources through an interface that senior managers easily understand.
- DSS supports decision-making for unusual and rapidly evolving issues, for which there are no fully predefined procedures.
- An information system (IS) is a set of interrelated components that collect, manipulate, store and disseminate information and provide a feedback mechanism to achieve a goal.
- An important benefit of adopting a functional structure is that each person tends to learn a great deal about his or her particular function.

1.8 EXERCISES

1. What type of structure best describes the organization of your college or university? What led you to reach your conclusion?

2. The movie Office Space illustrates two types of structures. What are some other scenes or themes from movies that provide examples or insights relevant to understanding organizational structure?

1.9 REFERENCES

- Business Driven Information Systems - McGraw Hill
- Fundamentals of Information Systems | IT & Systems Textbook
- Management and Business Policy: Globalization, Innovation and Sustainability | Fifteenth Edition | By Pearson
- Strategic management author: **pearce**
- Management Information Systems: Managing the Digital Firm by Kenneth Laudon (Author), Jane Laudon (Author)
- https://www.wiley.com
- https://www.academia.edu/9464635/Strategic_Roles_of_information_Systems_Introduction

2

TYPES OF INFORMATION SYSTEM (IS)

Unit Structure

2.0 OBJECTIVES

The main objective of learning this MIS subject is to make students understand that how MIS can provides the data to identify non-performing areas and leads to better business productivity and efficiency, better communication and helps in decision making and most important to get better knowledge of customer needs.

2.1 INTRODUCTION

The main goal of MIS is to provide information for decision making on planning, imitating, organizing, and controlling the operations of the subsystems of the firm and to provide a systematic organization in the process.

2.2 INTRODUCTION TO MIS

Management Information System is an integrated system that helps management with relevant information needed to run their business effectively and efficiently.

The core aim is to make raw data into useful information that helps in managerial decision making.

2.3 TYPES OF INFORMATION SYSTEM (IS)

An information system contains a set of interconnected components or devices that's works together to collect, process, store and breakdown the information to support decision making in an organization.

The various dimension of Information System are:

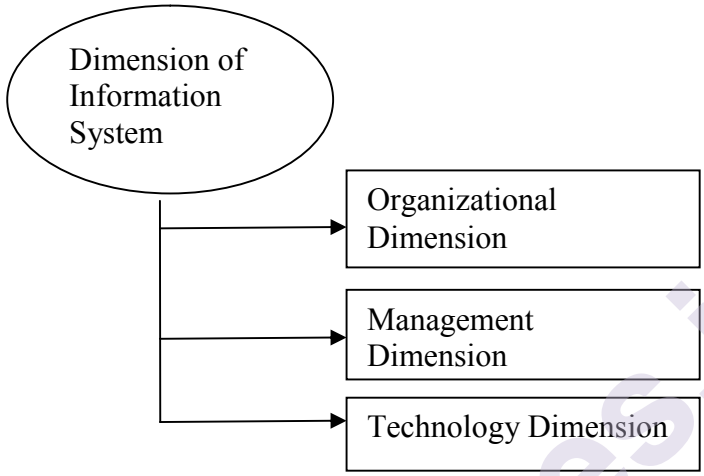


Figure (a)

a) Organizational Dimension:

- In any organization the information system is a part and plays a vital role in decision making.
- It governs the standard operating procedure and culture of any organization. It includes are as follows:

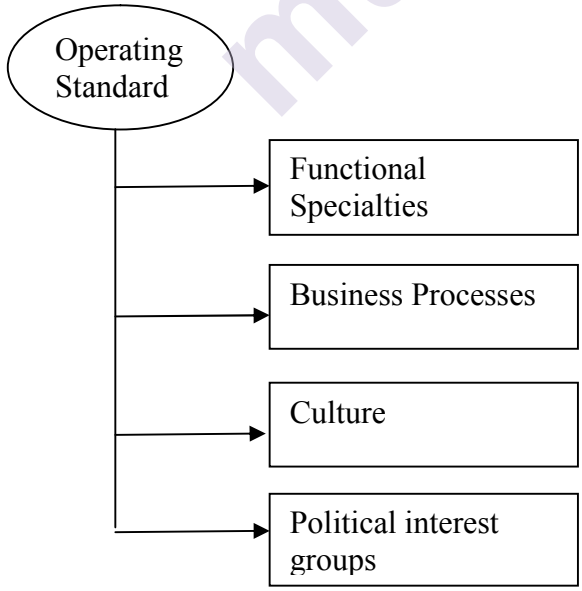


Figure (b)

b) Management Dimension:

- The business managers always face challenges in the business environment.
- For decision making the information system provides the tools and information that are needed by the mangers to allocate, coordinate and monitor their work, create new products and services and make long range strategic decision

c) Technology Dimension:

- To carry out or to execute any function in an organization the management takes help of technology.
- The technology comprises of computer hardware, software, data management technology, networking telecom technology.

The information system classified by:

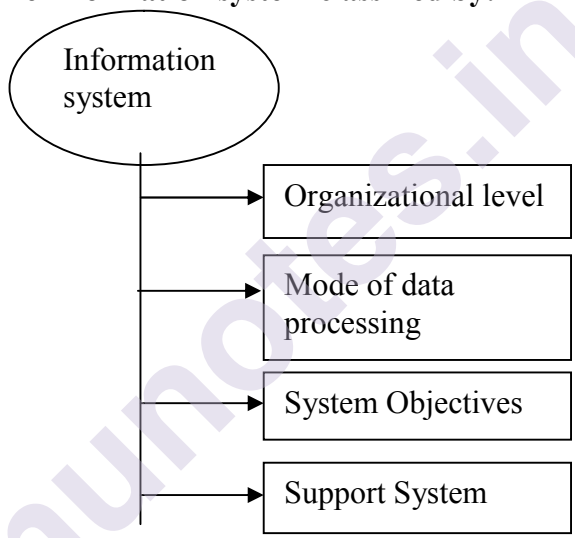


Figure (c)

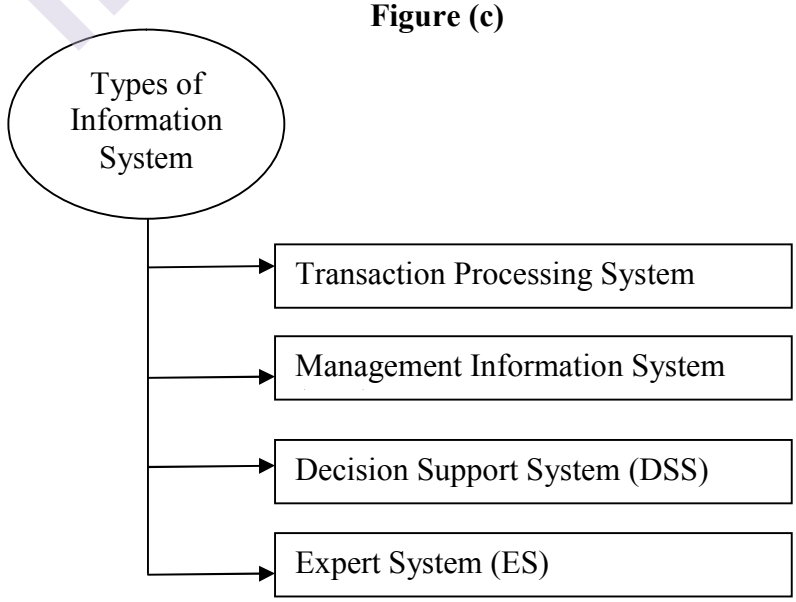


Figure (d)

2.4 TRANSACTION PROCESSING SYSTEM (TPS)

- The information system that involves process of data resulting from any business transaction is called Transaction Processing System.
- Its aim is to provide transcation in order to update the records and generate reports which helps in future auditing.
- A transaction is any business related exchange such as payments to employess sales to customers.
- A transaction is an exhange of goods, services, and or communication between two sides that has an effect on eaxch side.
- In the simplest case ,a conversation between you and a friend is a transaction.
- You exchnage information and both of you are affected by the exchange.
- Operational managers need system that keep track of the elemnetray activities and transactions of the organizations, such as sales, receipts, cash deposits, payroll, credit decisions, and the flow of materials in a factory.
- TPS are computerized systems that perform and record the daily routine transactions necessary to conduct the business.
- They serve the organizations operational level.
- The prinicipal purpose of system at this level is to answer questions and to track the flow of transactions through the organizations.
- At the operational level, tasks, resouces and goals are predefined and highly structured.
- Example of TPS a Payroll TPS where the payroll processing captures employee payment transaction data such as a time card.
- System ouputs inlcude online and hard copy reports for management and employee paychecks.
- Other examples sales order entry, hotel reservations, employee record keeping and shipping.

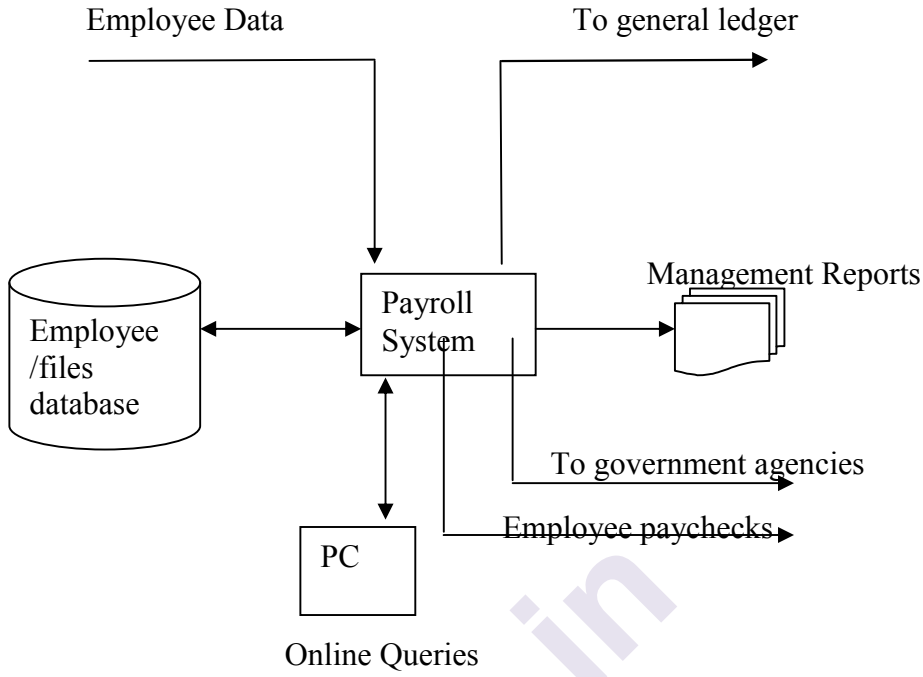


Figure (e)

- It is an information processing system that captures and processes every single transaction that takes place within the organziation .

- These transcations include activities involving collection, retreival, modification, and all other set of activities that trigger the retrieval of all transactions.

- A transaction processing system is highly reliable, consistent and efficient.

- The types of transaction processing system are:
  a) Batch processing
  b) Online transaction processing
  c) Example are billing system, payroll system, stock control system.

1) Batch Processing / Batch Mode:

- The Processing of transaction take place over batches.
- These batches can be customized as per organization requirements.
- For example a company may want to process the payroll of its employee in a weekly or bi-weekly manner, thus the batches of employee salaries will be processed over a span of one and two weeks respectively.
- There is genreally a time delay in this type of processing, examples include bill generation and check clerance.

2) Real time processing / Stream processing / online mode:

- under the real time processing, every single transaction is processed with immediate effect.
- There is no time delay in the real time processing system.
- Example include bank ATMs, traffic control system.

3) Handling and managing operations:

- It allows multitasking at a wider leven with an unmatched ability to process thousands of transactions at the same time without any delay or break down.

4) Tapping the raw markets:

- TPS is a carrier tool for any business since it gives the businesses the freedom to operate in different segements of the society by working remotely.
- This operability gives the businesses an opportunity to tap, exist and grow in newer that are raw and full of opportunities.

Features of (TPS):

1) Reliability :

- It is a highly reliable system that manages and handles the important transactions of an organization. Since the revenue system is completely dependent on the TPS, it is crucial to the seamless working of any organziation.

2) Fast Response:

- rapid response time ensures that your customers do not have to wait for their transaction to be processed.

3) Similar Structure and integrity:

- Due to its ability to maintain the same method for all transaction
- processed, it protects data and easliy defends any error and for all transactions processed, it protects data and easily defends any error and hardware software issues.

4) Authorized control (security):

- TPS allows only the authorized personal to conduct the processing activities anytime.
- With the recent advancements, the newer veersions even allow authrized personal to gain access from a remote location as well but with high and stringent security checks.

5) User friendliness:

- By being user-friendly, it encourages human interaction / interface and decreases errors inputting of data.

2.5 MANAGEMENT INFORMATION SYSTEM (MIS)

- The raw data which gets available through the transaction processing system and converts them into a summarized and into an aggregated form for the further decision making are designed using management information system.

- It is used to guide tactic managers to make semi-structured decisions.

- The output from the transaction processing system is used as input to the MIS system.

- The report which is generated are used by the middle management and operational supervisors. Many different types of report are generated by the MIS.

- Examples are summary report, on-demand report, ad-hoc reports and an exception report. Sales management system, Human resource management system.

Advantages:

1) Provide relevant information for facilitating planning and timely control.

2) Data is available in summarized from which minimize information loading.

3) Ease in measuring performance helps in encouraging decentralization in an organization.

4) Improve coordination as all departments are aware of course of action or any changes in plan.

5) Enhance quick, cheap, and efficient communication.

6) Bring down linguistic, geographical and cultural boundaries

7) 24*7 availability of information.

8) Automation helps in saving time and papers.

9) Creation of new type of jobs like computer programmer, system analyzer, software and hardware developer, etc.

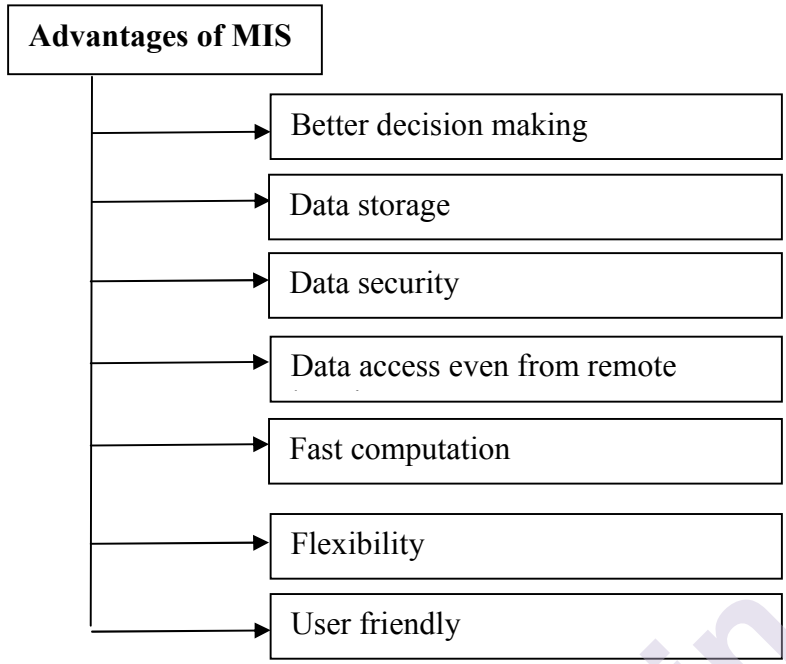


Figure (f)

Disadvantages:

1) Require constant monitoring of sensitive data.
2) Security issues like hacking always prevail.
3) Quality of output depends on quality of input.
4) Implementation of MIS is costly as requires hardware, software and training of human resources.
5) Lack of flexibility to upgrade software.
6) Takes only quantitative data
7) Increase unemployment
8) Effectiveness decreases due to frequent change in top management and their policies.

Limitations of MIS:

- MIS is conceived as a data processing and not as an information processing system.
- MIS is impersonal gives function called information not as needed by the manager.
- Poorly designed MIS may not handle business complexities.
- Requires strict quality control measures to efficiently utilise input, processing and output procedures.
- MIS is developed without streamlining the transaction processing system in the organization.
- Require skilled handling.
- MIS is not a tailor made information package.

2.6 DECISION SUPPORT SYSTEM (DSS)

- Decision Support System allows the decision makes to retrieve the data and test alternative solutions during the process of problem solving.
- Decision support systems can be either fully computerized, human powered or a combination of both.
- It is an interactive user friendly management level, computer system that combines data and sophisticated analytical models and tools to support semi structured and unstructured decision making.
- A DSS does not make decision rather it is a powerful tool that is used to support decision making.
- Decision support systems (DSS) support management decisions that are unique and rapidly changing using advanced analytical models.
- DSS enables companies to segment the customer database with a high level of precision where it can be used to drive a marketing campaign.
- Based on the results of data mining, a firm can develop specific marketing campaigns for each customer segment.
- For example, it could target frequent customers living near a store with coupons for products of interest and with rewards for frequent shoppers.

Example

1)Oracle Performance Management Application.
2)IBM Decision Optimization for Watson Studio.
3)Decision Tools Suite
4)Paramount Decision.

The Three key elements of DSS:

1. Organizational data
2. A model
3. A user interface

The characteristic of DSS:

1) Provide rapid access to information.
2) Handle large amount of data from different sources.
3) Provide report and presentation flexibility
4) Support drill down analysis
5) Perform complex, sophisticated and comparison using advanced software packages.
6) Support for decision-makers in semi-structured and unstructured problems.
7) Support for managers at various managerial levels, ranging from top executive to line managers.
8) Support for individuals and groups.
9) Support for interdependent or sequential decisions.
10) Support for intelligence, design, choice, and implementation phases.
11) Support for variety of decision processes and styles.

12) DSSs are adaptive over time.
13) DSS offer users flexibility, adaptability and a quick response .
14) DSS allow users to initiate and control the input and output.
15) DSS operate with little or no assistance from professional programmers.
16) DSS provide support for decision and problems whose solutions cannot be specified in advance.
17) DSS use sophisticated analysis and modeling tools.

Advantages

1)Improving personal efficiency.
2)Improving problem solving
3)Facilitating communication
4)Promoting learning or training
5)Increasing organizational control.
6)It increased the speed and efficiency of decision making activities.
7)DSS can collect and analyze real time data.
8)It promotes training within the organizations, as specific skills must be developed to implement and run a DSS within an organization.
9)It improves interpersonal communication within the organizations, through meetings, brainstorming sessions, etc

Disadvantages

1) Limited storage capability.
2) Limited information sharing
3) Difficult
4) Require extensive knowledge
5) The cost to develop and implement a DSS is a huge capital investment, which makes it less accessible to smaller organizations.
6) A DSS may lead to information overload because an information system tends to consider all aspects of a problem.

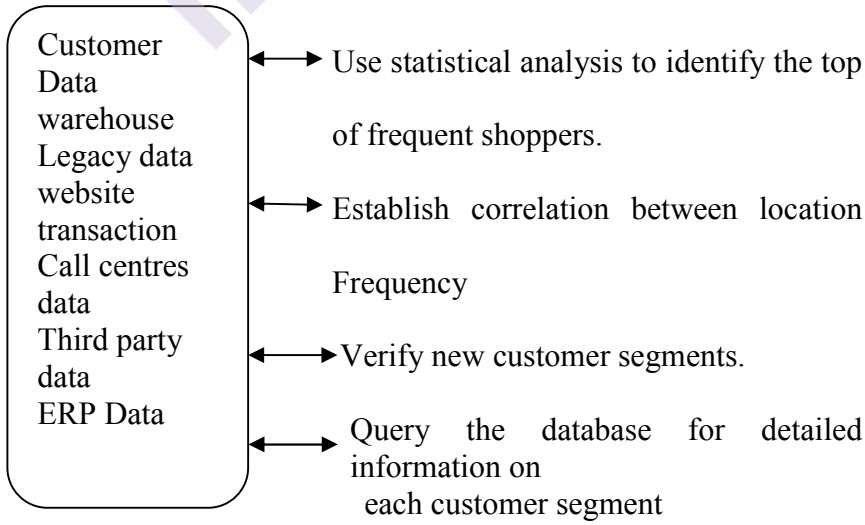


Figure (g)

The components of DSS are:

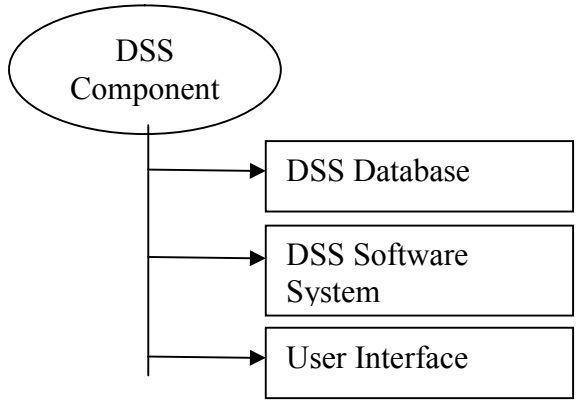


Figure (h)

1)The DSS Database

- The Database is a collection of records which is collecetd from number of applications.
- The DSS database can be a small database which resides in the pc
  or a large data wareshouse.

2)DSS Software System:

- Some software system contains the tools which are used to analyse the data, including OLAP tools, data mining tools, or a collection of mathematical or analytical models.
- OLAP or data mining tools.

3) User Interface:

- It is used to control the interaction between the users of the system and the DSS software tools.
- It is verty flexible to use as it is graphical user interface.

2.7 EXECUTIVE INFORMATION SYSTEMS FOR STRATEGIC MANAGEMENT

- Strategic information systems are the information where basically different sectors companies use to help to achieve their desire goals and to get more efficient outcomes.
- Many businesses use these systems to achieve a competitive advantage on their competitors as their target is to provide a good service as compare to their competitors.
- For example, a strategic information system can be used to provide a product at a lower cost than competing organizations.
- A strategic information system can offer competitive advantage to an organization in the followings ways:

1) Creating barriers to competitors entry:

- In this strategy, an organization uses information systems to provide products or services that are difficult to duplicate or that used to serve highly specialized
- This prevents the entry of competitors as they find the cost for adopting a similar strategy very high.

2)Generating databases to improve marketing:

- An information system also provides the companies an edge over their competition by generating databases to improve their sales and marketing strategies.
- Such systems treat existing information as a resource.
- For example, an organization may use its databases to monitor the purchase made by its customers, to identify different segments of the market, etc.

3)Locking in customers and suppliers:

- Another way of gaining competitive advantage is by locking in customers and suppliers.
- In this concept, information systems are used to provide such advantages to a customer or a supplier that it becomes difficult for them to switch over to a competitor.
- For example, an organization may develop its information system and

4)Lowering the cost of the products:

- Strategic information systems may also help organizations lower their costs, allowing them to deliver the products and services at a lower price than their competitors can provide.
- Thus such information system can contribute to the survival and growth of the organizations.
- For example airlines use information systems strategically to lower costs so that they may counter competitors discount fares.

5)Leveraging technology in the value chain:

- This approach pin points specific activities in the business where competitive strategies can be best applied and where information systems are likely to have a greater strategic impact.
- This model advocates that information technology can be best used to gain competitive advantage by identifying specific, critical leverage points.

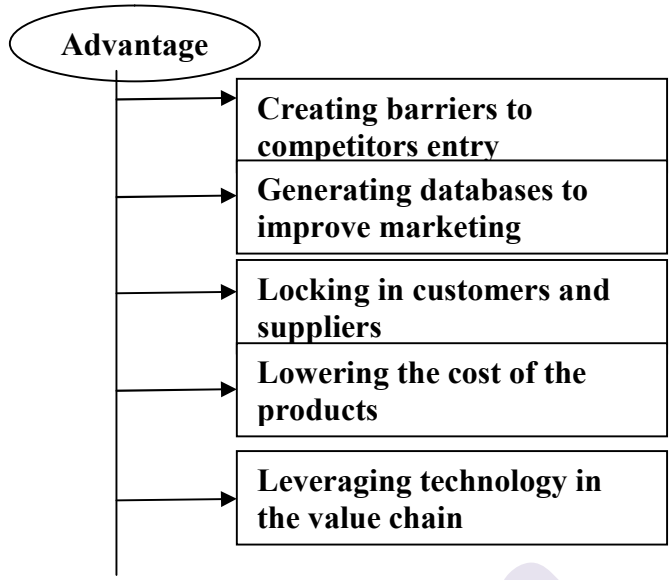


Figure (i)

Contents of EIS:

1)Easy to understand and collect

2)Should cover each and every aspect

3)Should depict contribution clearly.

4)Should be user friendly and promote team work

5)Availability

6)Dynamic

7)Reduce workload.

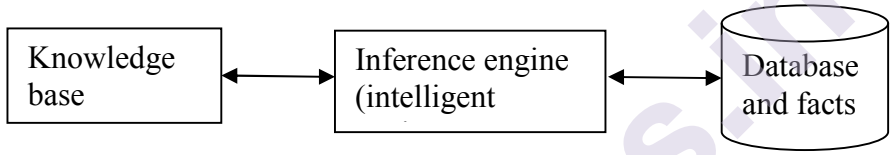
Characteristic of EIS:

- Serves top level executive.
- Future oriented
- Informal source
- Lack of structure
- Less detail
- High degree of uncertainty
- Can access both internal and external data.
- Provides extensive online analysis tools for taking correct decision
- Extract summary data

- Quickly provides needed information (timely)
- Provides such information in graphical form.
- Supports decision making.

2.8 KNOWLEDGE BASE INFORMATION SYSTEM

- A knowledge based system is a form of artificial intelligence that aims to capture the knwoledge of human experts to support decision making.
- A knwoledge based system is a computer base program that reasons and uses a knowledge base to solve complex problems.
- KBS is a system that draws from knowledge of human experts caputred in knowledge base to solve problems that normally require human expertise.
- KBS is more general than expert system.



- It has 3 components:

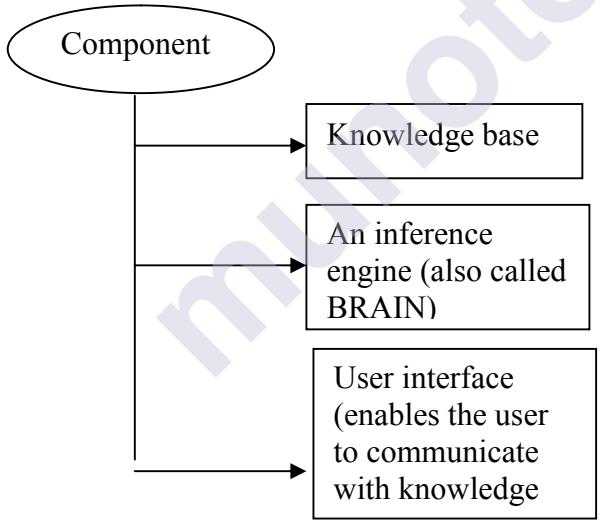


Figure (j)

Type's knowledge base system:

a) Procedural knowledge (describes how to solve problem):

- Its is also known as Impertaive knowledge.
- Provides direction on how to do something.
- Can be directly applied to a task.
- It includes: rules, strategies, procedures.

b) Declarative knowledge:

- Tells us the facts what things are
- It includes : concepts, facts, objects
- Also called descriptive knowledge.

c) Meta knowledge:

- Its describes knwoledge about another knwoledge
- Used to pick other knwoledge that is best suited for solving a problem.

d) Heuristic knwoledge:

- It is representing knwoledge of some experts in a field or subject.
- It desrcibes rules of thumb that guides reasoning process.

e) Structutral knwoledge:

- It is the basic knwoledge to problem soving.
- Its describes the relationships between various concepts includes as kind of, part of, group of
- It also describes an expert overall mental model of problems.

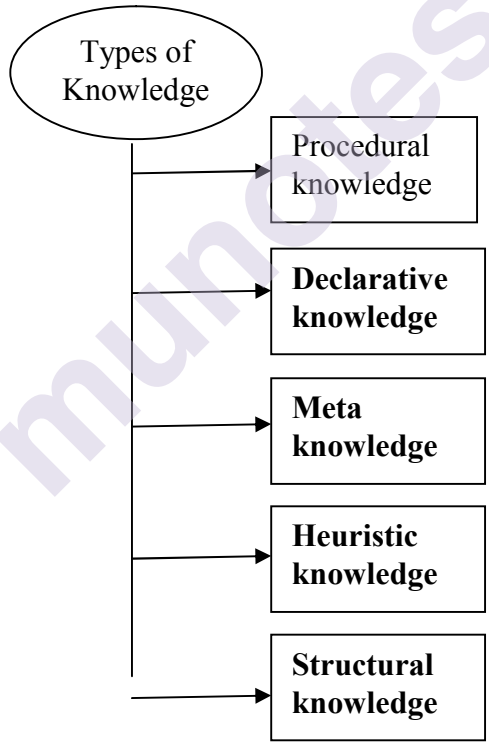


Figure (k)

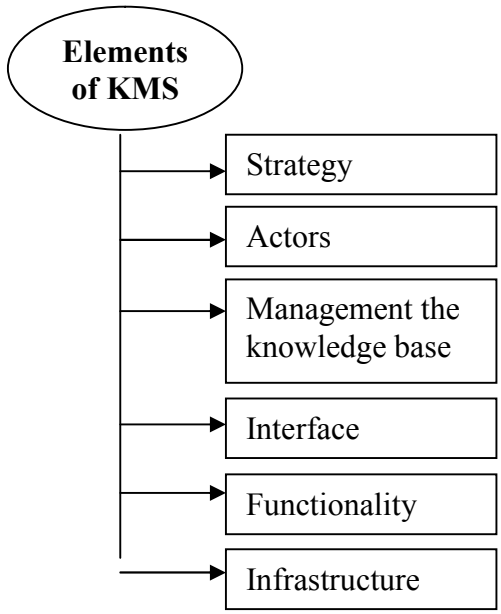


Figure (l)

2.9 ARTIFICIAL INTELLIGENT (EXPERT SYSTEM)

- A computer program that uses the concepts of artificial intelligence (AI) technologies to simulate the judgement and behaviour of a human or an organization that has expert knowledge and experience in particular field.
- Example Chabot, voice recognition.
- Example DENDRAL: expert system used for chemical analysis to predict molecular structure.
- PXDES: an example of expert system used to predict the degree and type of lung cancer.

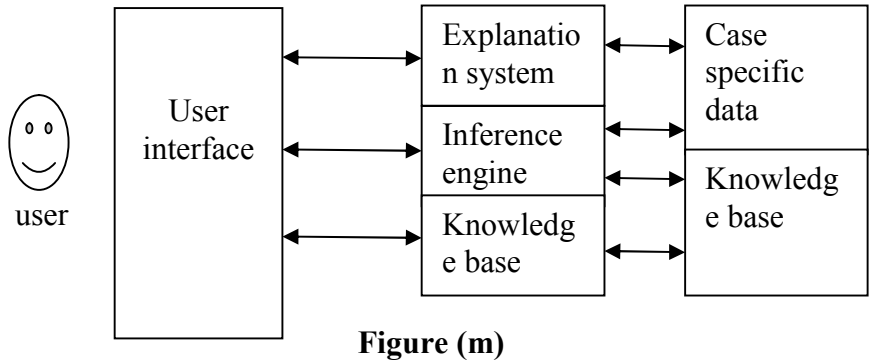


Figure (m)

Applications of expert system are:

1)Medical diagnosis.

2)Scientific analyses

3)Clinical systems

4)Automobile manufacturing

5)Flight tracking system

6)Robotics

7)Mathematics concepts applications

8)Nuclear power.

Characteristics of Expert system are:

1)Efficient and reliable.

2)Highly responsive

3)High performance

4)Reasoning process

5)Increased accessibility.

2.10 SUMMARY

This course will helps the students to understand that everyone who works in business will learn how to put technology to work and companies and organziations across industries.

2.11 REFERENCES FOR FURTHER READING

Google.com

Youtube video

2.12 MCQ QUESTIONS FOR PRACTICE

Q1. A DSS stands for.

A. Decision Support System

B. Decisive Support System

C. Developed Support System

D. None of the above

Q2. An MIS information comes from the,

A. Internal source

B. External source

C. Both internal and external source

D. None of the above

Q3. A back-bone of any organization is its,

A. Information system

B. Sources system

C. Management system

D. None of these

Q4. Which is a characteristic as queries are Information?

A. Transaction Processing System (TPS)

B. Management Information System (MIS)

C. Decision Support System (DSS)

D. Executive Support System (ESS)

Q5. An important characteristic of effective and useful information is/are

A. Accuracy

B. Timeliness

C. Completeness

D. All of the above

3

DETERMINING INFORMATION NEED

Unit Structure

3.0 OBJECTIVES

In this unit you will be able to understand the concept of

- Need for information
- Role of information
- Overview and Use of Data
- The Importance of Information
- Steps of Decision Making Process
- Decision Making Models
- When to use decision Making Models

3.1 NEEDS FOR AN ORGANIZATION/INDIVIDUAL MANAGER

Information is very much needed to make right decisions. Management is faced with an accelerating rate of change and an ever more complex environment. A multitude of factors may need to be considered for a given decision.

Examples include; planning regulations, local and central government legislation, the attitudes of employers, customers, trades unions, consumer groups and so on, the financial consequences of the decision, environmental factors, technological and capacity considerations, marketing and advertising implications, resource and supply problems etc.

For each and every one of the above examples—and others—the manager needs relevant information which is information that increases his knowledge and reduces his uncertainty and thus is usable by the manager for the intended purpose.

Without relevant information no manager can function effectively. A worthwhile extension to the well-known adage that management get things done through people, would be that, 'management get things done through people, by using relevant information.

One of the most important processes in managing the activities of an organisation is making decisions about alternatives. When the information available is not sufficient to make a decision, the manager needs to gather more information about the alternatives, compare them, and then choose an alternative. Decisions made without sufficient information are at best only estimates and typically lead to poor management performance.

As shown in Fig. 39.3, quality information in the hands of those who can make good use of it supports appropriate management decision making. The resulting management performance should then lead to the successful achievement of the organisational objectives.

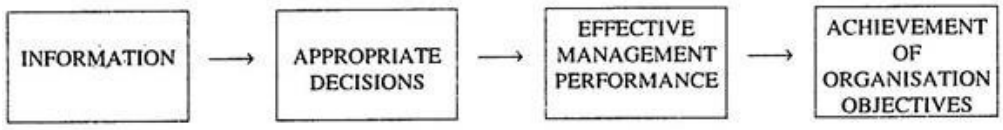
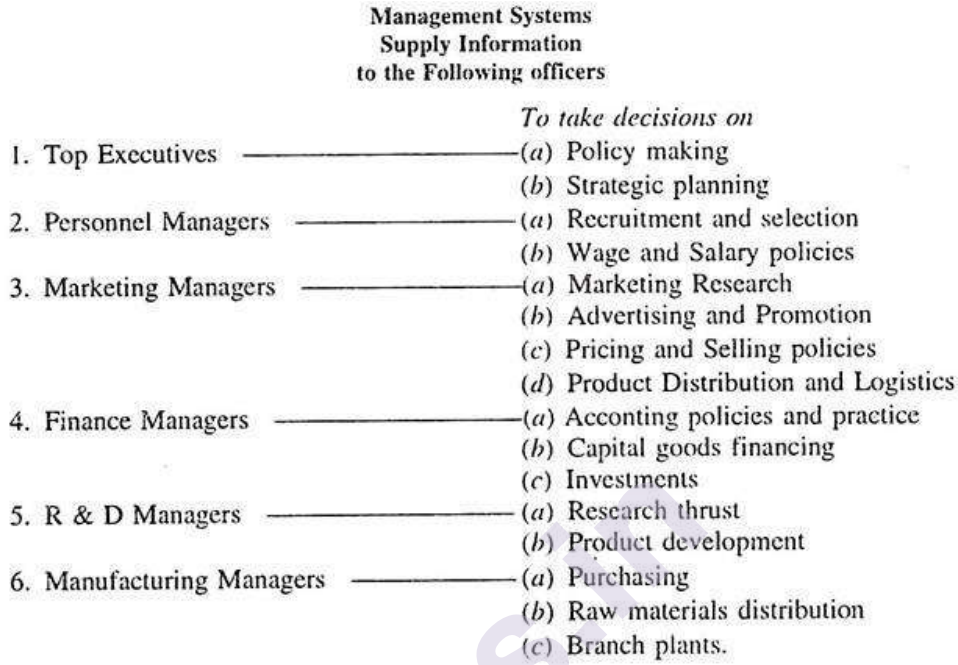


Fig. 39.3. The role of information

Thus, information is the common element that holds an organisation together.

The relationship of the information systems of an organisation to the decision making within that organisation is given below:



Every organisation is dependent upon information for its survival. In order for managers to take action that will yield effective results, they need information that is accurate, timely, complete, concise, and relevant. There is no assurance that the manager will use this type of information effectively; however, it must be available to be used. In most cases, the availability of information to a manager will have a strong influence on the rationale applied in decision making. Managers are often required to make decisions with information that lacks one or more of the properties above.

This can have an undesirable impact on the effectiveness and efficiency of their decisions:

(1) The accuracy of information is the ratio of correct information to total amount of information produced over a period of time. For example, if the monthly sales forecasts provided to a plant manager are not consistently accurate, it is difficult for the manager to make effective decisions concerning production schedules.

(2) Timeliness of information is a reflection of whether or not the information arrives in time to be used by a manager in making a decision. The plant manager must receive the monthly sales forecast in time to make a decision about the monthly production schedule.

(3) Completeness of information requires that a manager be provided with all of the information needed to make a decision. If sales forecasts cover only two-week periods, it is difficult to make decisions about monthly production schedules.

(4) Conciseness of information is obtained through the summarization of relevant data. Such data may point out exceptions to normal or planned activities. A manager who receives concise information is saved a great deal of time otherwise spent in analysis of information for decision making.

(5) For information to be relevant, it must provide to each involved manager what he or she needs to know. Information should not be given to a manager who does not have the authority to make the decision(s) which should be based on the information.

(6) Information should be produced and provided at a frequency which is related to the type of decision/activity involved. The frequency may be an hour, a day, a week, a month etc.

(7) Information should be presented in a style and format readily understandable by the person concerned. The producer of the information must be aware of the recipient's knowledge, literacy level, experience etc.

A frequent problem in many organisations is that a great deal of information is generated for no real purpose and should be eliminated. Apparently there seems to be a tendency to generate large quantities of information on the assumption that a direct relationship exists between the amount of information and the quality of decisions. This can only be true if the information is relevant and provided to the right decision maker-that is, is provided to the right person at the right time.

One useful approach to the effective design and utilisation of an MIS is to think of information as a basic resource of the organisation as we do money, materials, personnel, and plant and equipment.

Thus as a basic resource, information:

1. Is vital to the survival of the organization.

2. Can only be used at a cost.

3. Must be at the right place at the right time.

4. Must be used efficiently for an optimal return on its cost to the organisation. Each user of information should consider the cost of the information relative to its utility for decision making. For example, the cost of complete information for a decision must be weighed against the expected value of a decision with incomplete information.

3.2 OVERVIEW AND USE OF DATA

Data **allows organizations to more effectively determine the cause of problems**. Data allows organizations to visualize relationships between what is happening in different locations, departments, and systems.

The Importance of Data

Data is essentially the plain facts and statistics collected during the operations of a business. They can be used to measure/record a wide range of business activities - both internal and external. While the data itself may not be very informative, it is the basis for all reporting and as such is crucial in business.

Customer data are the metrics that relate to customer interaction. It can be the number of jobs, the number of enquiries, the income received, the expenses incurred, etc. In order to know about our interactions with the customer, we need data.

The importance of data cannot be under-stated as it provides the basis for reporting the information required in business operations.

Data Vs Information

An important distinction to make is the difference between Data and Information.

Data is the raw facts and statistics, whereas Information is Data that is accurate and timely; specific and organised for a purpose; presented within a context that gives it meaning and relevance; and can lead to an increase in understanding and decrease in uncertainty.

Another way to look at information is as data that has been interpreted and then presented in a more meaningful context. that allows a business to make decisions from how to identify what data is relevant for your business and how you can collect it.

analysis of information, etc

3.3 THE IMPORTANCE OF INFORMATION

key importance of information - it allows a business to make informed decisions by presenting data in a way that can be interpreted by management. In this context, customer information would be useful in providing metrics surrounding client/customer engagement to determine better ways to engage or work with your clients.

However, it must be stated that the value of information lies not only in the information itself, but the actions that arise from the information. For example, if the information alerts you to poor customer satisfaction, it is only useful if this creates a change in the way the business deals with customers. Hence the information process should form part of a wider review process within the business to gain the best outcomes. Information plays a vital role in just about everything we do in modern society. Information is facts, data, numbers, images, documents, sound or act of a person to be delivered to the recipient in order to explain, inform and verify that the recipient may use such information for any particular purpose. In other words, information is knowledge that derived from data, which have been transformed, interpreted, stored and used for some purposes. With that

information we can find out what we do not know before and it will affect what we already know. Besides, we can make a right decision. Decisions are impossible without information and users are constantly seeking more and better information to support decision making. It also can reduce the sense of doubt and a sense of uncertainty about the information. For example, accounting information is very important for a company to be able to determine the profit or loss of the business.

Information is an elusive concept and there is a continuing debate about its meaning and about its relationship to its correlates such as knowledge, expertise, the learning process and cognitive psychology. For our practical purposes, we will use the term in its widest sense to cover all kinds of facts and understanding having a bearing on organizational management. Thus, we are concerned with numerical data, factual knowledge, narrative accounts, opinions and evaluations. We also need to be clear that information has meaning only when perceived and interpreted by the human recipient. Information is raw material for the mind, which uses it to develop skills, knowledge and, ultimately perhaps, wisdom. Practically speaking, any organization needs information both about its own internal processes, in order to ensure effectiveness and efficiency, and about its environment, in order to respond and adapt to the actions, attitudes and decisions of external agencies such as governments, competitors and social groups. Both types of information must be put together in a co-ordinated manner so that the actions and decisions of the organization can be matched closely to its external circumstances. In the remainder of this article, information processing is considered primarily in the context of business organizations, and the examples are taken from this sector. However, it is to be understood that the principles and problems addressed here are largely common to all types of organization, with only minor differences of detail and emphasis. The following are examples of the kinds of information which might be sought by a business:

- What are the rates of output of our various assembly lines?
- How has the unit cost of manufacturing product X varied over the last 12 months and what has caused the variations?
- What were the profit margins of our different divisions in the last financial year?
- Should we buy or lease a replacement for machine X and what information is needed to make this decision?
- What are the views of staff on the proposed reorganization?
- What are the training needs of the employees who will be working on the new project?
- What European regulations and standards would apply to our proposed new product? • Is our new manufacturing process patentable?
- What share of the market is held by our main competitor? How does this compare with our own share? • What are the likely effects on our business of the reunification of Germany? • Who are the alternative suppliers of raw material Y?
- What are the properties of the new material Z which has just come on to the market, and could it be used to replace our present raw material?

- What are the long-term trends in the age distribution of the population, and what are the implications for our business?

3.4 HOW MANAGERS USE INFORMATION

It is self-evident that the nature of managerial jobs must determine the kinds of information the managers use, how and where they find it, and what they do with it. The traditional view sees the manager's job in terms of functions such as planning, organizing, decision making, staffing, control and budgeting. These are indeed important outcomes of managerial activity, but they tell us little about what managers actually do, or how they think about and reflect on their work. There have been several studies of managers' work, some of them very influential. Perhaps the best known is that of Mintzberg, who concluded that all managers' jobs are similar and can be described in terms of ten roles in three groups as follows:

(1) Interpersonal: • Figurehead. • Leader. • Liaison.
(2) Informational: • Monitor. • Disseminator. • Spokesperson.
(3) Decisional: • Entrepreneur. • Disturbance handler. • Resource allocator. • Negotiator.

All three groups, not just the informational, depend on the use of information for their success. Other studies have stressed the importance of management functions such as communications, human resource management, agenda setting (determining goals, priorities, etc.) and network building. In their concern to establish general characteristics of managers, they overlook, or at least de-emphasize, two key points:

(1) There is considerable variation between managers according to their seniority. Clearly, there is a world of difference between the roles and activities of a chief executive officer and those of a plant foreman, even though both may be described as managers, using the term in its widest sense.

(2) There are real differences between managers performing different functions. Thus, the production manager and the research manager may well perform the same ten roles defined by Mintzberg, but may have quite different approaches to them. Take the case of leadership, for example. A production manager, faced with the need for close control of output and careful work scheduling, may tend towards authoritarianism and direction; whereas a research manager, coping with open-ended tasks and indeterminate timescales, may see him/herself as the first among equals, stimulating debate and encouraging creativity. This is partly because in some influential quarters decision making is seen as synonymous with management, or at any rate as the activity which defines it most fully. Moreover, decision making perhaps makes more demand for information than most other managerial activities. Management decisions are about making choices between alternatives.

- strategic – operational;
- unstructured – structured;
- dependent – independent.

Strategic decisions are those which are concerned with the relationship of the organization to its environment, and affect or involve all or a large part of the organization. They are often unique, having no precedents, and are usually taken in the higher reaches of the organization. Operational decisions largely are confined to one part of the organization and are internal matters concerned with the transformation of inputs into outputs. They are often routine and so procedures for making them may have been established, that is to say they are programmable. They are usually taken in the lower ranks of the hierarchy. An unstructured decision is "ill-defined, fuzzy and difficult to tackle". There are no known rules or procedures for making it. It may not be clear who should make the decision, or even whether there is a decision to make. The outcomes are unpredictable. A structured decision is "clear, well defined, distinct and unambiguous". There are established and agreed procedures for making it. It is quite clear who the decision maker should be, and the possible outcomes are predictable. A dependent decision is one which cannot be taken independently of decisions made in other, perhaps all, parts of the organization. It may also be dependent on decisions taken in the past, which have pre-empted some of the options, and it may in turn predetermine future decisions. An independent decision can be taken without taking into account decisions made elsewhere in the organization. It has no timebased consequences or preconditions of the kind mentioned above. Often, these dimensions can be used in combination. Thus, strategic decisions normally are unstructured and dependent; whereas operational decisions usually are structured and independent. Consider the following examples of decisions. A decision on whether to enter a new market This decision is strategic, because its outcome may change the organization's relationship with its environment. It affects the position of the whole organization, and will be taken at the highest level. It is unstructured, because it is not clear how it should be made. Even if the firm has entered new markets before, the different circumstances may mean that these earlier experiences offer no safe guidelines for the new decision. The outcome is quite uncertain. Finally, the decision is dependent, because it may call for decisions to be made by all parts of the organization, concerning a variety of matters, such as new production methods, new product design, changes in marketing and sales methods, new organization structure, newly trained labour, and changes in finance. It also commits the organization to future actions and decisions, perhaps for several years.

3.5 VALUE OF INFORMATION

The *Value of Information (VoI)* is a concept from decision analysis: how much answering a question allows a decision-maker to improve its decision. Like opportunity cost, it's easy to define but often hard to internalize. The VoI is sometimes distinguished as *Value of Perfect Information,* also called *Value of Clairvoyance (VoC)*, and *Value of Imperfect Information*. They are closely related to the widely known expected value of perfect information and expected value of sample information. Kindly Note — VoI is not necessarily equal to *"value of*

decision situation with perfect information" — "value of current decision situation" as commonly understood.

For example, consider two army commanders in a war at two different battle fronts. One of the commanders has an adequate supply of ammunition, food ration, and drinking water (more than he could desire) for his battalion and another has exhausted his supplies. If one were to approach these two individuals with information about a *"drinking water well"* in the surrounding, such information will obviously have greater value for the one who has exhausted his water supply. For the one who is thirsty, this information is the most valuable piece of information for him at that point of time as it will determine if his troops will survive. If by chance the information reaches this thirsty battalion late and his troops start dying out of thirst, then the value of the same information becomes zero. So we can see that the same information can have a different value for different people at different points in time. Hence, it will be quiet fair to conclude that value of information is relative. There is no absolute value of information.

Data is all about the collection of facts in a capsulated form. Multiple-Data capsules form Information stack which in turn creates knowledge. In a layman's term — the knowledge can be described as a mix of information, understanding, capability, experience, skills, and values. The real question is what we derive out of that knowledge? And, the answer is Wisdom, which can be described as the ability to think and act using the knowledge which has been built up on the information stack and data capsules.

When applying the *Rowley's DIKW (Data-Information-Knowledge-Wisdom) pyramid* [2] in a business context, the process of moving up from data to wisdom could be described as business intelligence, mainly because business data has the potential to result in business knowledge and wisdom.

3.6 CRITERIA WHICH DEFINES THE VALUE OF INFORMATION

1. Accuracy/precision/correctness — Information should be precise and close to reality. Also, information should be free of distortion, bias, or errors.

2. Consistency — The information should be free of contradictions or convention breaks.

3. Applicability — Information should be able to be applied directly.

4. Clarity/format — Information should be well, understandable and clearly presented to the user.

5. Comprehensiveness/completeness — The scope of information should be adequate. There should be not too much nor too little information

6. Conciseness — The information should be to the point and should void of unnecessary elements.

7. Convenience — The information should correspond to the user's needs and habits

8. Currency — The information should up-to-date and not obsolete

9. Traceability — The background of the information should be traceable, such as the used data, author(s)

10. Accessibility — The information should be continuously accessible without not too many obstructions

11. Flexibility — The information should be able to adapt to (the changing demands of) the user?

12. Integration — The system should allow data to be integrated from various sources

13. Reliability — The system operation should be reliable

14. Timeliness/Speed — The information should be processed and delivered rapidly without delays. The information should also match the user's working pace

When evaluating information-based products, the efficiency, effectiveness, context coverage can be measured by using quantitative data. The other criteria are mainly qualitative and subjective. Do note, the subjective value approach varies widely with individuals. In the subjective valuation of information, no probabilities are calculated. The subjective value of information is the person's (receiver's) comprehensive impression about the information content. To measure all criteria quantitatively surveys with Likert scales are required for instance.

But, when assessing the value of future information products, it can be challenging because the information cannot be used yet. When creating information products it is recommended to keep the usability criteria in mind. For some criteria, it is possible to measure their value by making estimations. Thus, we can say that the issue of the value of future information is a complicated one.

However, the normal mathematical and economical explanation of the VoI suggests that if an event occurs whose expectation was low and information of its occurrence is known then such information is valuable. For example, let us say that the reader of this text, a soldier manning the Doka La pass gets the information that China is going to escalate its troop movement across the pass and epicenter of the conflict will be the very spot on which he is located, then that information is more valuable to him than the information (say) that he has to report at officer's mess for a dinner event with his colleagues. In the former case the information is more valuable to him as he is not expecting it but in the latter case he already knows the information with certainty and expects it fully and hence the value of such information is less. All decision mechanisms work on this model of information. This suggests the value of information of an event is the negative logarithm of the probability of occurrence of the event. Therefore, the more unlikely the event the more its information tends to have higher value, if communicated correctly. This is also exhibited in our behavior as eons of evolutions have shaped us in a manner that we tend to attach more value to unlikely events.

3.7 DECISION MAKING AND DECISION MAKING PROCESSES

A decision-making process is a series of steps taken by an individual to determine the best option or course of action to meet their needs. In a business context, it is a set of steps taken by managers in an enterprise to determine the planned path for business initiatives and to set specific actions in motion. Ideally, business decisions are based on an analysis of objective facts, aided by the use of business intelligence (BI) and analytics tools.

In any business situation there are multiple directions in which to take a strategy or an initiative. The variety of alternatives to weigh -- and the volume of decisions that must be made on an ongoing basis, especially in large organizations -- makes the implementation of an effective decision-making process a crucial element of managing successful business operations.

Decision making is a daily activity for any human being. There is no exception about that. When it comes to business organizations, decision making is a habit and a process as well.

Effective and successful decisions make profit to the company and unsuccessful ones make losses. Therefore, corporate decision making process is the most critical process in any organization.

In the decision making process, we choose one course of action from a few possible alternatives. In the process of decision making, we may use many tools, techniques and perceptions.

In addition, we may make our own private decisions or may prefer a collective decision.

Usually, decision making is hard. Majority of corporate decisions involve some level of dissatisfaction or conflict with another party.

3.8 WHAT IS A DECISION-MAKING MODEL?

A decision-making model is a system or process which individuals can follow or imitate to ensure they make the best choice among various options. A model makes the decision-making process easier by providing guidelines to help businesses reach a beneficial conclusion.

Decision models also make the decision-making process visible and easily communicable for everyone involved, including all managers, stakeholders and employees. They can be used for a wide variety of purposes across departments, businesses and industries, but they are especially useful when selecting software vendors or new tools, choosing new courses of action or when implementing changes that effect large amounts of people.

3.9 TYPES OF DECISION-MAKING MODELS

Common types of decision-making models include:

Rational models. Rational decision-making is the most popular type of model. It is logical and sequential and focuses on listing as many alternative courses of action as possible. Once all options have been laid out, they can be evaluated to determine which is best. These models often include pros and cons for each choice, with the options listed in the order of their importance.

A rational decision-making model typically includes the following steps:

1. Identify the problem or opportunity.
2. Establish and weigh decision criteria.
3. Collect and organize all related information.
4. Analyze the situation.
5. Develop a variety of options.
6. Assess all options and assign a value to each one.
7. Decide which option is best.
8. Implement the decision.
9. Evaluate the decision.

Intuitive models. These decision-making models focus on there being no real logic or reason to the decision-making process. Instead, the process is dictated by an inner knowledge -- or intuition -- about what the right option is. However, intuitive models are not solely based on gut feelings. They also look at pattern recognition, similarity recognition and the importance or prominence of the option.

Recognition primed models. These models are a combination of rational and intuitive decision-making. Its defining element is that the decision maker only considers one option instead of weighing all of them.

The recognition primed decision-making process involves:

1. Identifying the problem, including all its characteristics, problem cues, expectations and business goals.
2. Thinking through the plan and performing a mental simulation to see if it works and what modifications might be needed.
3. If the plan seems satisfactory, then the final decision is made, and the plan is implemented.

In recognition primed models, alternative courses of action are only considered if the original plan does not produce the intended results. The success rate of this model correlates to an individual's experience and expertise.

Creative models. In this decision-making model, users collect information and insights about the problem and create some initial ideas for solutions. Then, the decision maker enters an incubation period where they do not actively think about the options. Instead, they allow their unconscious to take over the process and eventually lead them to a realization and answer which they can then test and finalize.

Data-driven decision making

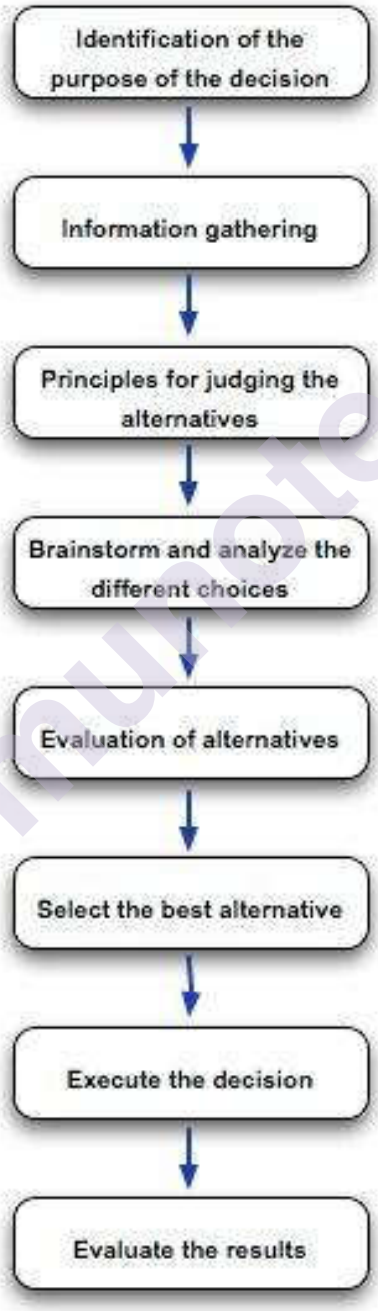
Traditionally, decisions were made by business managers or corporate executives using their intuitive understanding of the situation at hand. However, intuitive decision-making has several drawbacks. For example, a gut-feel approach makes it hard to justify decisions after the fact and bases enterprise decision-making on the experience and accumulated knowledge of individuals, who can be vulnerable to cognitive biases that lead them to make bad decisions. That's why businesses today typically take more systematic and data-driven approaches to the decision-making process. This allows managers and executives to use techniques such as cost-benefit analysis and predictive modeling to justify their decisions. It also enables lines of business to build process automation protocols that can be applied to new situations as they arise, removing the need for each one to be handled as a unique decision-making event.

If designed properly, a systematic decision-making process reduces the possibility that the biases and blind spots of individuals will result in sub-optimal decisions. On the other hand, data isn't infallible, which

makes observing the business impact of decisions a crucial step in case things go in the wrong direction. The potential for humans to choose the wrong data also highlights the need for monitoring the analytics and decision-making stages, as opposed to blindly going where the data is pointing.

3.10 STEPS OF DECISION MAKING PROCESS

Following are the important steps of the decision making process. Each step may be supported by different tools and techniques.



Step 1: Identification of the purpose of the decision

In this step, the problem is thoroughly analysed. There are a couple of questions one should ask when it comes to identifying the purpose of the decision.

- What exactly is the problem?
- Why the problem should be solved?
- Who are the affected parties of the problem?
- Does the problem have a deadline or a specific time-line?

Step 2: Information gathering

A problem of an organization will have many stakeholders. In addition, there can be dozens of factors involved and affected by the problem.

In the process of solving the problem, you will have to gather as much as information related to the factors and stakeholders involved in the problem. For the process of information gathering, tools such as 'Check Sheets' can be effectively used.

Step 3: Principles for judging the alternatives

In this step, the baseline criteria for judging the alternatives should be set up. When it comes to defining the criteria, organizational goals as well as the corporate culture should be taken into consideration.

As an example, profit is one of the main concerns in every decision making process. Companies usually do not make decisions that reduce profits, unless it is an exceptional case. Likewise, baseline principles should be identified related to the problem in hand.

Step 4: Brainstorm and analyse the different choices

For this step, brainstorming to list down all the ideas is the best option. Before the idea generation step, it is vital to understand the causes of the problem and prioritization of causes.

For this, you can make use of Cause-and-Effect diagrams and Pareto Chart tool. Cause-and-Effect diagram helps you to identify all possible causes of the problem and Pareto chart helps you to prioritize and identify the causes with highest effect.

Then, you can move on generating all possible solutions (alternative) for the problem in hand.

Step 5: Evaluation of alternatives

Use your judgement principles and decision-making criteria to evaluate each alternative. In this step, experience and effectiveness of the judgement principles come into play. You need to compare each alternative for their positives and negatives.

Step 6: Select the best alternative

Once you go through from Step 1 to Step 5, this step is easy. In addition, the selection of the best alternative is an informed decision since you have already followed a methodology to derive and select the best alternative.

Step 7: Execute the decision

Convert your decision into a plan or a sequence of activities. Execute your plan by yourself or with the help of subordinates.

Step 8: Evaluate the results

Evaluate the outcome of your decision. See whether there is anything you should learn and then correct in future decision making. This is one of the best practices that will improve your decision-making skills.

Challenges in the decision-making process

Balancing data-driven and intuitive approaches to decision-making is a difficult proposition. Managers and executives may be skeptical about relying on data that goes against their intuition in making decisions or feel that their experience and knowledge is being discounted or ignored completely. As a result, they may push back against the findings of BI and analytics tools during the decision-making process.

Getting everyone on board with business decisions can also be a challenge, particularly if the decision-making process isn't transparent and decisions aren't explained well to affected parties in an organization. That calls for the development of a plan for communicating about decisions internally, plus a change management strategy to deal with the effects of decisions on business operations.

Decision-making models can also be used to avoid these various challenges by creating a structured, transparent process.

3.11 WHEN TO USE DECISION-MAKING MODELS

Even when rules and procedures are set up to make business decision-making more systematic, there can still be room for intuition on the part of decision-makers. For example, after gathering data about different alternatives, more than one might seem similarly advantageous, or management might find itself lacking certain information needed to make a decision with full confidence. This is a good use case for incorporating an intuitive decision-making model into the process.

On the other hand, decisions that happen frequently and have clear optimal outcomes benefit from a structured, rational decision-making models. This approach to business problem-solving uses clearly prescribed steps and, usually, data analytics software to evaluate the available options and arrive at a decision.

Sometimes involving more people in the decision-making process can pay off. This is known as participatory decision-making; in the business world, it involves managers seeking input and feedback on decisions from the workers they oversee. The participatory approach has the potential advantage of generating many ideas for solving a business problem; it also helps to engage employees.

Decision management

Decision management -- also known as enterprise decision management (EDM) or business decision management (BDM) -- is a process or set of processes that aims to improve the decision-making process by using all available information to increase the precision, consistency and agility of decisions. The processes also focuses on making good choices by taking known risks and time constraints into consideration.

Decision models and Decision support systems (DSS) are key elements of decision management. Decision management processes also use business rules, business intelligence (BI), continuous improvement, artificial intelligence (AI) and predictive analytics to access the capabilities of big data and meet the needs of modern day user expectations and operational requirements.

Decision management systems treat decisions as reusable assets and introduce technology at decision points to automate the decision-making process. Decisions may be fully automated, or they may be presented as possible choices for a human to select.

Increasingly, organizations who deal with financial services, banking and insurance are integrating decision-making software into their business process systems as well as their customer-facing applications. This approach is especially useful for high-volume decision-making because automating such decisions can enable more efficient, information-based and consistent responses to events.

3.12 KEY POINTS

- When it comes to making decisions, one should always weigh the positive and negative business consequences and should favour the positive outcomes.
- This avoids the possible losses to the organization and keeps the company running with a sustained growth. Sometimes, avoiding decision making seems easier; especially, when you get into a lot of confrontation after making the tough decision.
- But, making the decisions and accepting its consequences is the only way to stay in control of your corporate life and time.

- Value of Information (VoI) is a concept from decision analysis: how much answering a question allows a decision-maker to improve its decision
- When applying the *Rowley's DIKW (Data-Information-Knowledge-Wisdom) pyramid* [2] in a business context, the process of moving up from data to wisdom could be described as business intelligence, mainly because business data has the potential to result in business knowledge and wisdom.

3.13 QUESTIONS

(1) Explain importance of information in Decision Making?

(2) Explain steps of decision Making process?

(3) What is decision Making Model?

(4) Explain different types of decision Making Models?

❖❖❖❖

4

MIS ACROSS THE FUNCTIONS OF THE MANAGEMENT AND SECTORS

Unit Structure

4.0 OBJECTIVES

The main objective of learning MIS is to helps various business sectors to make better decision based on the data information available. It helps to understand the complex computing problems and to apply the various logic and other relevant information to identify the solutions.

4.1 INTRODUCTION

The main goal of MIS is used to help the students to understand the types and components of MIS and its various sectors specific business solutions.

This course will make aware about the various possible option that can be applied while decision making.

4.2 INTRODUCTION TO MIS

Management Information System is a process that provides necessary information which helps in taking appropriate decision in the organizations.

It has a cleared defined protocol where it helps in deciding the guideline policies and best practices to deal with various decisions making in the organizations.

4.3 MIS ACROSS THE FUNCTIONS OF THE MANAGEMENT AND SECTORS

- There are various sectors in business world where the information system plays a vital role in decision making.
- MS is used or utilised by every level of a management.
- It focuses on the strategic goals and objectives for the management.
- It's also provides an effective system to analyse costs and revenue and further reviews effectively and efficiently to bring a balance in finance and costs.
- MIS is sustaining either through manual systems or automated system or a combination of both.
- It also plays an accretive role in identifying, locating, measuring, tackling, and limiting risks.
- It set down a framework which includes set of rules and regulation for the management to bring a clear and concise communication between employees.
- It provides an impartial system for collecting, assessing, and aggregating information for a business.

4.4 MARKETING INFORMATION SYSTEMS

- Marketing is usually that area of a company which requires lots of attention.
- Company sales depend on marketing so company must use adequate solutions for the more effective promotion of their products.
- For this purpose companies rely on marketing information system.
- Marketing information system allows a company to use all relevant information for developing its marketing strategies more effectively.
- It refers to the systematic collection, analysis, interpretation, storage and dissemination of market information, from both the internal and external sources, to the marketers on a regular and continuous basis.
- It distributes the relevant information to the marketers who can make the efficient decision related to the marketing operations like pricing, packaging, new product development, distribution, promotion, etc.

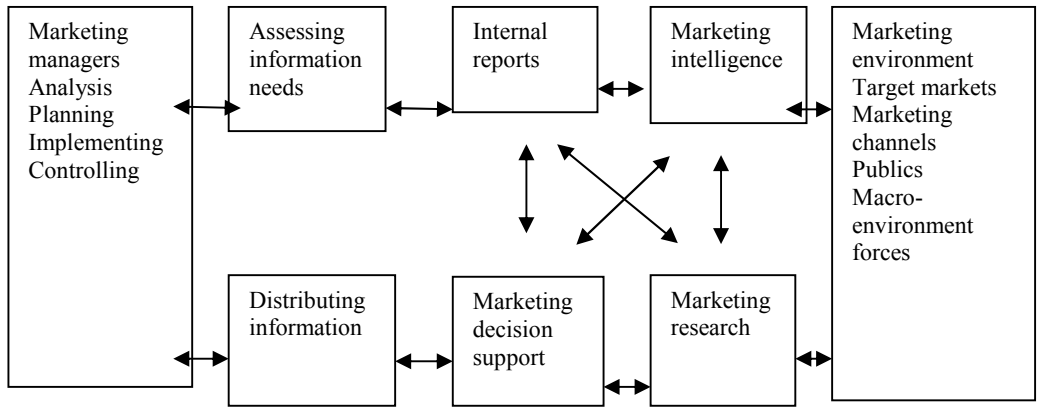


Figure (a)

Components of MIS are:

1) Internal reports:

- The most basic information systems used by marketing managers is the internal records system.
- Included in the internal system are reports on orders, sales, prices, inventory levels, receivables, payable, and so on.
- By analyzing this information marketing managers can spot important opportunities and problems.

2) Marketing Intelligence:

- A marketing intelligence system is a set of procedures and sources used by managers to obtain their everyday information about relevant developments in the marketing environment.
- Marketing managers often carry on marketing intelligence by reading books, newspaper and trade publications, talking to customers, suppliers, distributors and talking with other managers and personnel within the company.

3) Marketing Research:

- Marketing research is the systematic design, collection, analysis, and reporting of data and findings relevant to a specific marketing situation facing the company.

4) Marketing Decision Support System:

- A growing number of organizations are using a marketing decision support system to help their marketing managers make better decisions.
- A marketing decision support system (MDSS) is a coordinated collection of data, systems, tools and techniques with supporting software and hardware by which an organization gathers and interprets

relevant information from business and environment and turns into a basis for marketing action.

- Example please refer the diagram given below:

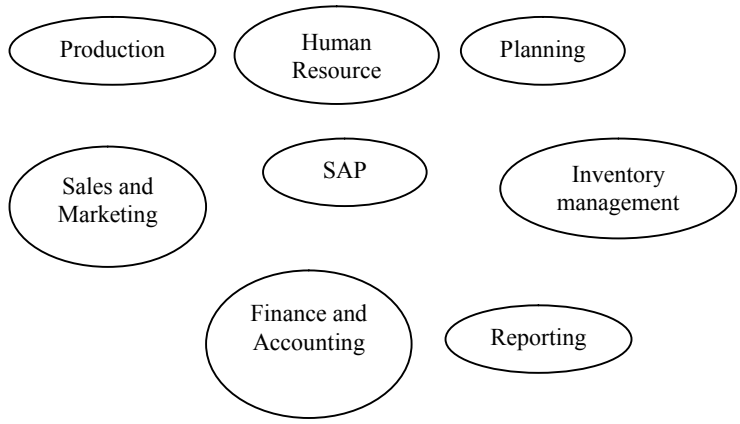


Figure (b)

4.5 MANUFACTURING INFORMATION SYSTEMS

- Manufacturing or production information system provides information on production or operating activities of an organization and thus facilitates the decision making process of production managers of an organization.
- Production is an act of transformation in which inputs are processed and transformed into outputs.
- Manufacturing is an important functional area of an organization which is engaged in producing goods from raw material.

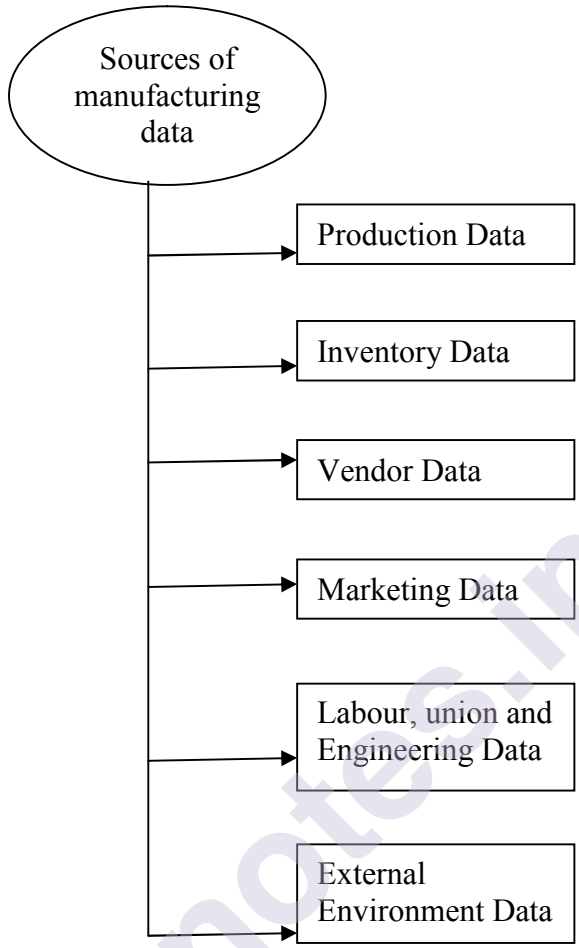


Figure (c)

1) Production Data:

- Data gathered and processed on production is used in every aspect of production control and also for billing and other rated areas.

2) **Inventory Data:**

- It includes inventories of raw materials, work in process and finished goods.
- It is important as running out of stock at certain critical times may shut down production lines leading to losses.

3) **Vendor Data:**

- It shows sources of raw materials.
- Though this data is normally maintained by purchase department, the manufacturing personnel should also be aware of the origins of the raw material and should know what new items are offered by the vendors.

4) Marketing Data:

- Marketing output is the feedback information for the manufacturing department.
- When marketing specifies what is required, only then it is manufactured.
- Therefore, it is important to integrate the two.

5) Labour, union and Engineering Data:

- Labour is the core of manufacturing awareness about labour market, labour union and personnel performance is a must for proper production scheduling and plant utilization.

6) External Environment Data:

- Knowledge of raw material prices and availability of labour is most important for manufacturing department.
- If the production manager anticipates rise in prices of raw materials, it would be wise to stock up the materials.

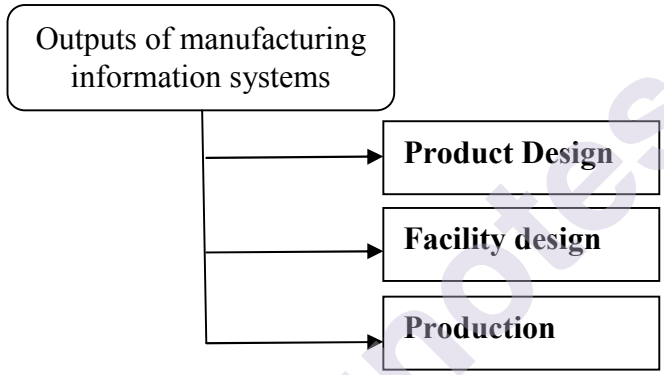


Figure (d)

Outputs of manufacturing information systems:

1) Product Design:

- It is also known as product engineering, includes the entire development of product through initial stages until actual manufacturing starts.

2) Facility design:

- It includes plant location and layout.
- Plant location determines the establishment of an organization at a particular place.
- It is an important decision because:
  - Location of plant partially determines operating and capital costs.
  - Each prospective location implies a new allocation of capacity to respective market area.

3) Production:

- It includes planning, directing and controlling of the material supply and other production processing activities.

- Production planning includes:
  - Preparing procurement plans for material and personnel.
  - Establishing inventory control procedures.
  - Preparing work authorization.
  - The task of production planning is accomplished through:-

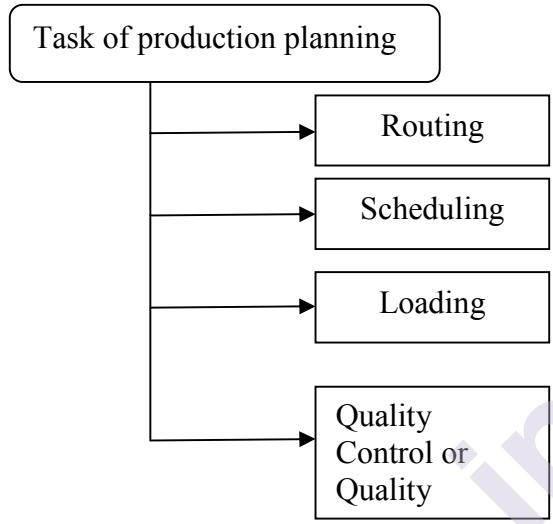


Figure (e)

1) **Routing:**

- It is the determination of path or route over which each price is to travel in the process of transformation of raw materials into the finished product.

2) Scheduling:

- It is about deciding when each operation in a production process is to be carried out.

3) Loading:

- It is to know when a particular equipment or machine will be available for work on each order or item.
- Loading provides information about whether the work load is greater or less than the capacity of equipment.

4) There are two types of production methods:

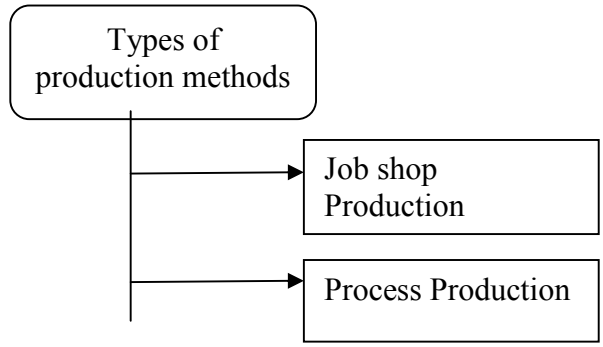


Figure (f)

a) Job shop Production:

- In which each other taken by the firm is considered to be a job and accordingly a cost is tagged.

b) Process Production:

- In which goods are produced data mass scale for general consumption.
- As new order arrives, they are filed on the basis of priority.
- For such system, a reorder level is to be identified for the goods stock.

5) Quality Control or Quality Assurance:

- Quality control ensures that the final product is of satisfactory quality.
- It is concerned with detecting existing quality deficiencies and rectifying them.
- Quality assurance is concerned with the prevention of future quality problems.
- This requires a discrete definition of each step of a process and ensuring that we stick to them.
- Various techniques which are used in controlling the quality of a product include inspection, statistical quality control, and control charts, etc.

4.6 HUMAN RESOURCE INFORMATION SYSTEMS

- It is a systematic way of storing data and information for each individual employee to aid planning, decision making and submitting of returns and reports to the top management.
- A method, by which an organization collects, analyses and reports the information about people and job.

Objectives of HRIS:

- To offer sufficient comprehensive and ongoing information about people and jobs.
- To supply up to date information at a reasonable cost.
- To offer data security and personal privacy.

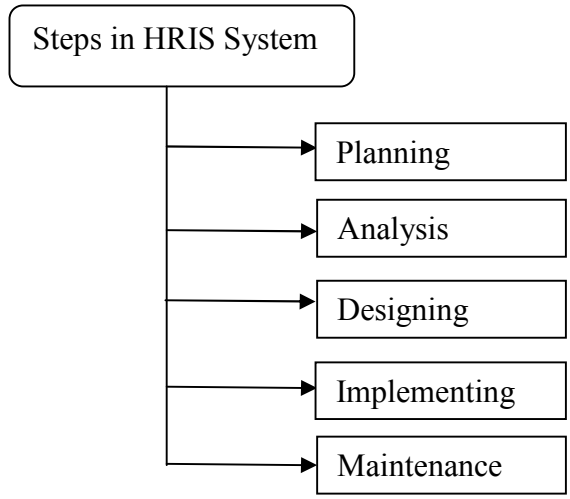


Figure (i)

1) Planning:
- Setting up the process.
- Feasibility study.
- Selecting a team for implementing HRIS.

2) Analysis:
- Defining the requirement.
- Vendor selection.
- Negotiation.

3) Designing:
- Examine the flow of information.
- Assembling the sub systems.
- Identifying the gaps.

4) Implementing:
- Training the people.
- Collecting the data.
- Implementing the system.

5) Maintenance :
- Time to time checkups.
- Auditing to ensure.

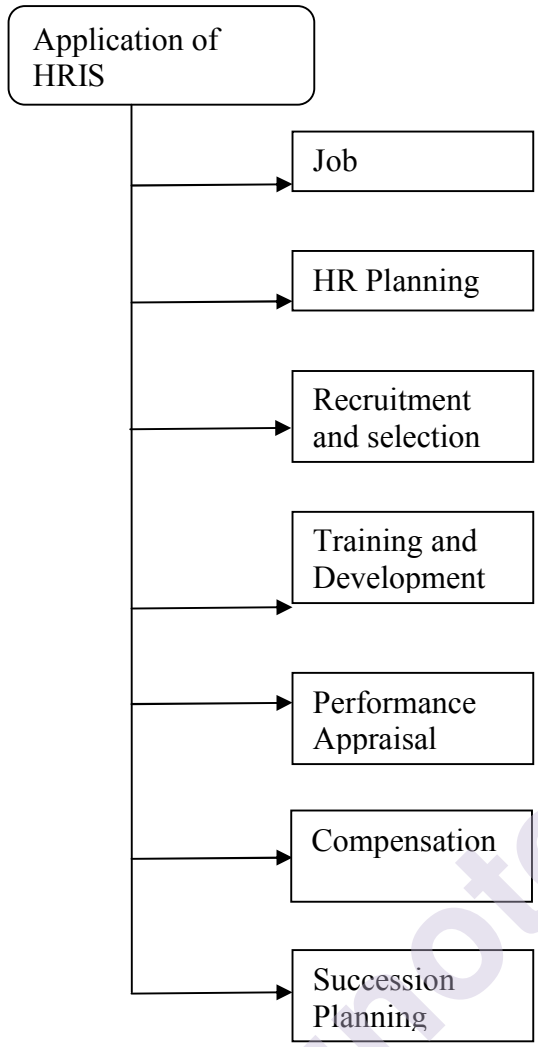


Figure (j)

1) Job description:

- Produce printout that describes the jobs according to the specification and input by the user.

2) HR Planning:

- Forecasting the actual demand calculating the surplus and shortage based on department and projects.

3) Recruitment and Selection:

- Applicant tracking
- Job person matching.

4) Training and Development:

- Identify training needs, setting skills levels.

5) Performance Appraisal:

- Performance assessment.
- Goal accomplishment
- Reward management.

6) Compensation:

- Tracks analyse and report of salaries.
- Automated bonus and pay grade structure reports.

7) Succession Planning:

- Report candidate who are eligible and necessary experience for the position.

Benefits of HRIS:

- Higher speed of retrieval and processing of data.
- Reduction in duplication of efforts leading to reduced the cost.
- Ease in classifying and reclassifying data.
- Better analysis leading to more effective decision making.

Limitations of HRIS:

- It may be expensive in terms of finance and manpower.
- It may be inconvenient for organization where people don't have the understanding using the system.
- It may not suitable for organization people lack data management skills.

Top of mind for HR leaders:

- Create an aligned and personalised talent experience.
- Find and hire the right people for the job and company culture.
- Accelerate time-to-impact with new hire on boarding.
- Drive talent success with professional development.
- Optimize HR programs with insightful people analytics.

4.7 FINANCIAL INFORMATION SYSTEMS

- Financial information means any information which can be
  - Measured in terms of money.
  - Bring change in the financial position of the entity.
- The finance function of a business is responsible for obtaining money needed by the business and planning the use of that money.
- Financial information system support financial managers in decision concerning:
  - The financing of business.
  - The allocation and control of financial resources within a business.

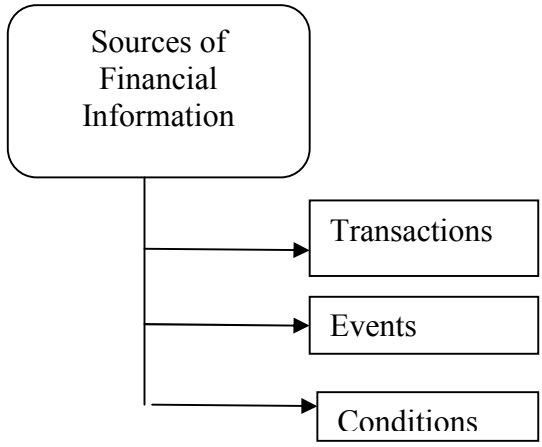


Figure (k)

1) Transaction:

- It means dealing between two persons / parties having a monetary impact on the financial statement / position of an entity.

➢ Dealing between two persons and parties.
➢ Measurable in terms of money.
➢ Bring change in the financial position of an entity.

2) Events:

- Loss of inventory by fire.
- Fluctuation gain / loss.

3) Conditions:

- Are some adjustments to already recorded transaction?
- Provision for debtors' creditors.
- Provision for discount on debtors / creditors.

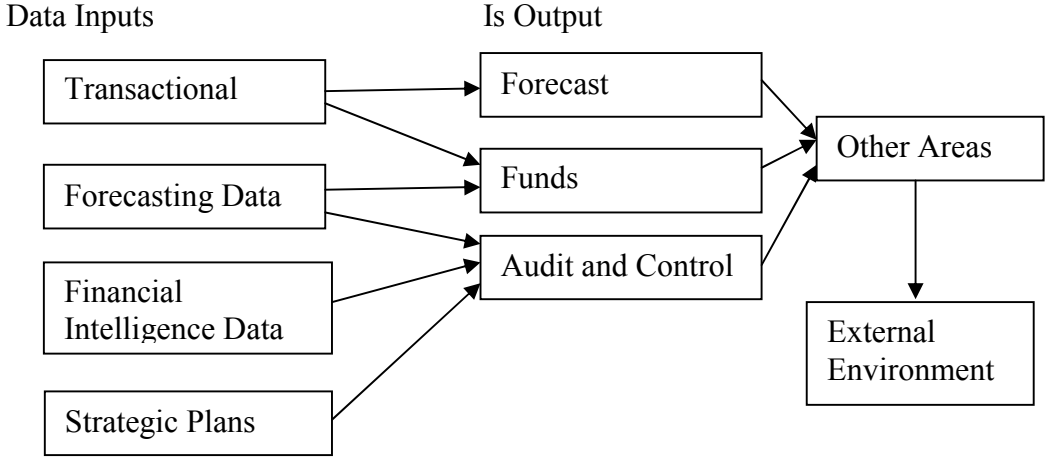


Figure (l)

1) Transactional Data:

- This data includes the transactions of revenue and expense incurred from each functional area.
- This data is captured through TPS.

2) Forecasting Data:

- For structured planning, an organization needs forecasting data from each functional area, which can be used to compare the actual transaction with the anticipated as per the forecast.
- This is also made available through TPS and MIS.

3) Financial Intelligence Data:

- An organization needs to gather the data from the financial communities like banks, government, stock market, etc.
- This data helps to monitor the pulse of the nation's economy and helps in analysing the trend that may affect the organizations economy.

4) Strategic Plans:

- It is an important indicator and measurement scale for any kind of financial transaction as it charts the future of the organization.

5) Forecasting:

- It involves business and economic trends and financial developments.
- Financial forecasting shows the estimated source and amounts of cash flowing into or out the organization.

6) Funds Management:

- It combines the financial forecast with income and disbursement
- related to external sources is often called the financial plan.

7) Auditing and Control:

- Auditing is an inspection that determines whether things are working according to the guidelines.
- A financial audit verifies the accuracy of an organizations financial accounting records.

Financial Information System (Financial Decisions)

1) Estimation of requirement of funds:

- A business must make a financial forecast.
- It is a careful estimation of funds and the time at which these funds would be required.

2) Capital Structuring decision:

- Funds can be procured from different sources for different periods.
- Each sources has its own cost and risk.
- A business must select an optimum mix of different sources of capital.

3) Capital budgeting decision:

- The capital budgeting process involves evaluating the profitability and financial impact of proposed capital expenditure.
- In this decision funds are allocated to long term assets which would yield returns in future

4) Dividend decisions:

- This decision relates to the dividend policy of the organization.
- A decision whether the organization should distribute all profits or retain them or distribute a portion and retain the balance has to be taken by the financial manager.
- He has to ensure there are adequate surplus in future for growth after distribution of dividends.

5) Tax management:

- Tax planning involves taking full advantage of rebates, concessions, exemptions. Deductions, allowances and other reliefs.

6) Current asset management:

- In order to safeguard the organization against liquidity or insolvency current assets of the organization should be effectively managed.

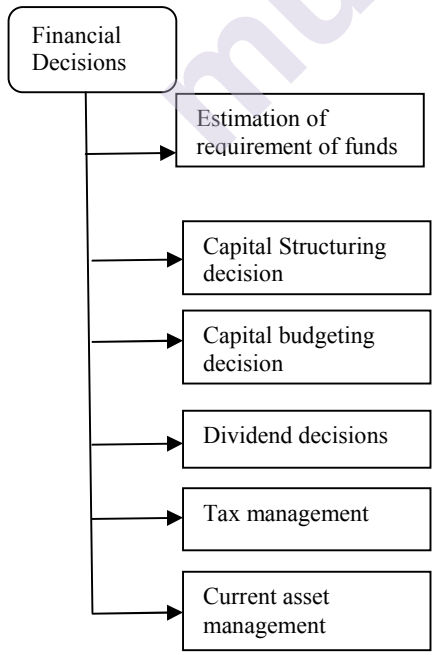


Figure (m)

4.8 INFORMATION SYSTEM REQUIRED ACROSS SECTORS

- Data are basic values or facts and are organised in a database.
- Information actually consists of data that has been organized to help answers and to solve problems.
- An information system is defined as the software / hardware that help organise and analyse data.
- The purpose of an information system is to 9erpturn raw data into useful information that can be used for decision making in an organization.
- There are some general types of information systems.
- For example, a database management system (DBMS) is a combination of software and data that makes it possible to organizes and analyse data.
- DBMS software is typically not designed to work with a specific organization or a specific type of analysis.
- There are a number of specified information systems that have been specifically designed to support a particular process with an organization or to carry out very specific analysis tasks.
- For example, enterprise resource planning (ERP) is an information system used to integrate the management of all internal and external information across an entire organization.

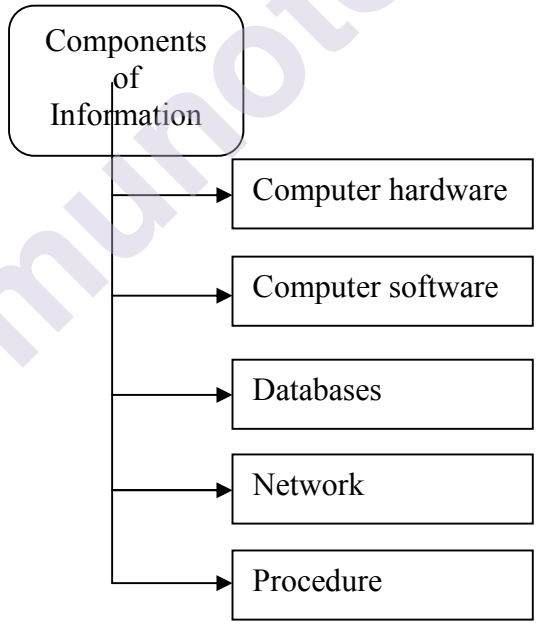


Figure (n)

4.9 SUMMARY

This course will helps the students to understand that how MIS plays a vital role in decision making in any organizations. With the help of MIS a business manager can take appropriate planning and control of various departments and its management.

4.10 REFERENCE FOR FURTHER READING

Goggle.com

You tube

MCQ FOR PRACTICE

Q1. Which of the following is true for CBT

a. It stands for Computer Based Training
b. It is a form of E-learning
c. All of the above
d. None of the above

Q2. A talent management plan aims at developing which of the following quality (ies) in employees:

a. Knowledge
b. Skills
c. Abilities
d. All the above

Q3. Which of the following is not a focus of Wage and Salary programme?

a. Conducting easy performance appraisals
b. Improvising performance of workers
c. Controlling pay costs
d. establishing individual training requirements

Q4. Which of the following deals further with data security, safety and data validation?

a. Data transferring
b. Data processing
c. Data managing
d. Data storage

Q5. As per which of the following methods, the human resource is valued on the basis of the contribution they are likely to make to the organisation till retirement.

a. Asset Multiplier Method
b. Replacement Cost Method
c. Economic Value Method
d. None of the above

5

STRATEGIC ROLES OF IS USE OF INFORMATION FOR CUSTOMER BONDING AND BUSINESS ALLIANCE BREAKING

Unit Structure

5.0 OBJECTIVES

- Know and be able to understand Strategic Role of IS
- Conditions/actions to ensure the successful deployment of strategic information systems
- Ways to Strengthen the bond between your business and your customers
- Ways to ensure successful strategic alliances
- Reasons for alliance failure
- Case Study: The Strategic Alliance Between Renault and Nissan

5.1 INTRODUCTION TO IS

Strategic information system **provides a connection between demands of organization and latest information technology**. This tactic helps an organization to get hold of the market by utilizing Information tech to

meet its challenging requirements to the continuous variation in the corporate environment

Strategic Information Systems are systems that help organizations alter their business strategies, plans or structure. They are also used to hasten the reaction time of the environmental changes and aid the organization to achieve a competitive advantage over its competitors. Strategic information systems are the traditional or conventional information systems used in innovative ways. The essential purpose of the strategic information systems is to help organizations to do things better. They also aim to develop and maintain the IS/IT systems that support the business operations in an effective way.

In the light of today's global economy, the organizations face several challenges such as globalization, privatization, stiff competition and more demanding customer expectations, coupled with daily advancement in information and communication technologies. In this environment, the top managers should understand and realize that the IS/IT is not merely a resource to support day-to-day operations. They should also realize that the clever use of IS/IT can significantly change an organization's long term strategic position in national and global markets. Therefore, it becomes increasingly imperative that the managers create new and different strategies including the change of top management for long-term planning and strategic decision-making versus the operational decision-making. Subsequently, if the organizations wish to remain successful and to be competitive, the managers need to consider Information Systems (ISs) as a tool utilized to gain competitive advantages, in order to overcome the other competitive organizations. So, the information systems that help seize opportunities of gain competitive advantages are often called Strategic Information Systems (SIS). The strategic information system can be defined as an information system that creates or enhances the company's competitive advantage or changes the industry structure by fundamentally changing how business is conducted. It is conventional information systems used in innovative ways. It can be any kind of information systems (such as TPS, MIS, DSS, EIS, OAS, ERP, etc.) that helps an organization:

1. Gain a competitive advantage
2. Reduce a competitive disadvantage
3. Meet other strategic organization objectives.

Hence, any IS having the ability to change the goals, processes, products, or environmental relationships to help an organization gain a competitive advantage or reduce a competitive disadvantage is a strategic IS In addition, the SIS involves using information technology to develop products, services, and capabilities that give a company strategic advantage over the competitive forces it faces in the global marketplace. The advances in information provision have led organizations to attempt to develop IS or IT strategies align with their business strategies to achieve many benefits Such as helping the organization to reduce overall costs, get fewer errors and greater accuracy when performing operations,

produce high quality products and services, accelerate communication and data sharing, improve performance and productivity, and make management more efficient and effective. Moreover, it gives the managers the ability to adjust, control and monitor all business processes which accordingly will accelerate the processes of the decision-making.

Laudon confirms that the top management must understand that not all strategic information systems are profitable, they can be expensive to build and easily copied by other firms so that strategic advantage is not always sustainable. Strategic information systems have to be built on the strengths of the company that cannot be easily imitated. It has been determined that lasting, sustainable competitive advantage can be gained from strategic information systems only if an organization possesses other resources as well. Such resources include :

1. A well-developed and flexible information technology platform or a database to obtain the advantages
2. Continual investment to maintain those advantages, Therefore, some of the recommended conditions/actions should be followed before the development and implementation of strategic information systems in the Organization. These proposed conditions/actions ensure the successful deployment of strategic information systems, which are as follows:

- Active support of senior organization management —not just MIS management — in the discovery of strategic opportunities and in the implementation process.
- Integration of planning for the strategic use of information systems into the overall organization strategic planning process.
- Direct reporting by those responsible for strategic use of information systems to the business managers of the area to be affected by the new system.
- Placement of control mechanisms in the hands of these business managers.
- Readiness for strategic use of information systems, implying the successful use of the MIS and technological platform already in place and experience with technological innovation.

Importance of Strategic information system

Strategic information system provides a connection between demands of organization and latest information technology. This tactic helps an organization to get hold of the market by utilizing Information tech to meet its challenging requirements to the continuous variation in the corporate environment.

5.2 TYPES OF INFORMATION SYSTEM STRATEGIC:

1. Operation support system

The primary purpose of this system is to keep a check on transactions, operations, control, chain supply, and management. It also helps to

facilitate internal and external talks, and it updates the central main database of the organization.

1. Management Support System

These systems facilitate and provide precise information and data to the manager for easy routines, decision-making processes. Decision support system which helps to solve particular issues related problems.

5.3 USES OF STRATEGIC INFORMATION SYSTEM:

1. Cost Leadership Strategy

Information systems are said to support this strategy if the company able to reach a position lowest costs in the industry, by way of business process engineering, lowering costs from suppliers, and reduce costs to customers. For the example most of retail company who create promotion of the retail product to attract customers to buy the product cheaper than the other companies.

2. Differentiation Strategy

Information systems are said to support this strategy if they can provide products or services unique and able to provide more value to customers compared to other competitors, namely by way of: utilizing information technology to create products or services that are different, and reduce the advantages of differentiation from competitors.

3. Focus Strategy

Information systems are said to support this strategy if they can help the company focusing on specific products or services within the organization.

4. Innovation Strategy

Information systems are said to support this strategy if they can find specific ways in doing business is by providing products or services with the latest innovations. For the example Apple Product that offers a lot of features and high qualities software in their smartphone, smartwatch, or laptop. Even the price is more expensive than similar products, but the people are willing to buy because of the high quality and the innovation.

5. Alliance Strategy

Information systems are said to support this strategy if they can create cooperative relationships which benefits both suppliers and other companies even with competitors.

6. Growth Strategy

Information systems are said to support this strategy if they able to develop and diversify market.

7. Quality Strategy

Information systems are said to support this strategy if they able to help improve the quality of the product or service.

5.4 WHAT IS CUSTOMER BONDING?

Customer bonding is, just as the term implies, the process through which a company or organization makes connections with its customers. The goal of customer bonding is to develop a relationship and sense of community, including the customers so that they:

- Feel welcomed
- Are more likely to continue patronizing the company (and its products or services)
- Are more likely to recommend the company to friends and family

This relationship is the product of positive one-on-one contact, mutually beneficial engagement, the sincere interest and participation of the company in the life and lifestyle of the consumer, a blend of customer loyalty and corporate support, and a common sense of mission. By engaging in consumer bonding, businesses can create a sense of loyalty and raise sales. However, along the way, they have an inclination to search out that there are varieties of other benefits that come from bonding with customers. As an example, getting regular customer feedback can help an organization improve its products or services, thereby making them more appealing to consumers.

Bonding is the response of the client to the manner in which the vendor addresses adversity. When someone on the vendor side takes their problem or issue seriously and works effectively to produce a successful result, customers love it. Customer retention is crucial for any business because a loss of customers is tantamount to a decrease in revenue; losing too many customers may mean a company's demise. In most markets today, customers expect that they're buying an entire product defined because of the thing itself plus the warranties, service, support, goodwill, and pleasant disposition of the staff. They also buy into what they hope would be a group of other consumers that will be able to offer support and guidance, a kind word, or real insight.

The retention of customers is a huge part of every business's success. The firm becomes more competitive when customer retention increases. The concept is pretty simple:

Loss of Customers = Loss of Revenue

The main aim, of course, is to attract clients and to raise profits in doing so. Indeed, a more sophisticated definition of the partnership is that it is not at all between the consumer and the seller or, at best, it is just part of it. Often the connection is between like-minded clients using the goods and services of the same provider.

The "share-of-mind" art of receiving consumers includes creating an idea of personal connection with the goods and/or services of the business. Consciousness reflects the weakest component of a relationship since it is non-interactive and relies solely on the understanding of the client. A company doesn't know the premise for a customer's positive or negative reaction to communication or advertising message at this stage of the link. Customers are also drawn off from a corporation for several reasons. These reasons include:

- Attracting companies with identical products or services; market players use different strategies to attract consumers, such as cheaper rates or additional services
- Being disappointed with customer service
- Being disappointed with the goods or services
- No longer wanting or needing the goods and/or services a company offers

Marketing has a special role in what looks like service to an untrained eye, because marketing is the leading user of social media in many businesses and the community that, at the moment, can do the most to make other departments understand the social benefits. A customer defines a service product as fulfilling one or more essential personal needs, such as self-satisfaction, reputation, or belonging. A customer will perceive the business as having values and preferences similar to his own and start developing a relationship with the business

One of the determinant factors of a company's success is the company's ability to cohere customers . The ability of employees to cohere customers can influence marketing performance improvement (Hajli & Lin, 2016). Increasing the ability to cohere customers is of substance and should not be delayed anymore. Therefore, all parties on customer networks must collaborate to achieve maximum results. Customers will feel attached to the company if the company can meet the needs and desires of customers (Dubihlela & Khosa, 2014). As customers are satisfied with the company's services, they will find it difficult to move to compete for products. Customers tend to make repeated purchases. This repurchase has a positive impact on marketing performance.

Marketing performance is an indicator of success for a profit-oriented organization.

Marketing performance can increase organizational performance (Chari et al., 2014). Therefore, marketing performance must be improved. The form of marketing performance can increase company profits. Providing quality products can meet customers' needs and desires as a way to increase company profits. Besides, increasing market segmentation can improve marketing performance. In a broad sense, market segmentation can increase the number of customers. If this is the case, customers naturally increase marketing performance.

Improving marketing performance is an absolute requirement to keep a company growing unless it cannot exist (Yao et al., 2013). Small and medium business actors need to pay attention to the tastes of customers so that the company can be developed considerably. To realize this requirement, the company seeks to do many things, for example, by tracing customers who are disappointed with the use of company products. Entrepreneurs can find out parts of products that do not connect to the customers' interests. Employers can evaluate and make improvements. Companies or small and medium businesses can function as ghost shopping by sending some of their marketing staff to act and disguise themselves as buyers. To support maximum marketing performance, it is important to strengthen relational capital. Good collaboration is also required for small and medium business actors in collaboration with company internal employees or employees, suppliers, customers and industry associations. This collaboration is mainly concerned with marketing performance. However, previous studies indicate that there is a controversy between relational capital and marketing performance. Some researchers claim that relational capital has a positive effect on marketing performance (Tayles et al., 2007; Wang et al., 2016). On the other hand, some researchers state that relational capital does not have a significant positive impact on marketing performance (Rasa, 2012; Smirnova et al., 2011).

5.5 WAYS TO STRENGTHEN YOUR BOND WITH CUSTOMERS

It takes more than just providing quality products and services to have a successful business—your reputation can be made or shattered by your customer service.

In the age of the Internet, it is easier than ever to say the wrong thing, and the results can be much more damaging than in days past. Fifteen years ago, if a manager or CEO said the wrong thing in a magazine or newspaper, it had a negative impact on their profile, but now news of a major faux pas can spread across the internet in a matter of hours.

Likewise, treating customers poorly can attract negative attention and can chase potential customers away—perhaps into the arms of your competitors. While money can buy you slick presentations, the best webinars, and celebrity endorsements, no amount of funding can buy you the respect and loyalty of a strong customer base.

How can you strengthen the bond between your business and your customers?

1: Treat your Customers as People, not just Money Dispensers

Businesses can easily make the mistake of taking customers for granted; large corporations and small firms alike can begin to view their customers as money-dispensers rather than people.

This is a huge problem in the long term. Focus on treating people as you would like to be treated: pay attention to their comments across social media (see below), conduct surveys (with incentives), and provide plenty of contact options—live chat, phone numbers, email addresses, and submission forms should all be readily accessible.

Research conducted by Aspect Software revealed that 77 percent of U.S. consumers view businesses with multiple communication channels as being easier to deal with, and 74 percent say these companies offer better service. Aim to be one of these companies.

2: Embrace the Speed, Simplicity, and Effectiveness of Social Media

Social media has changed the way most of us communicate. Whereas texting replaced the phone call (a problem for some, a welcome change for most), social media has replaced the text. Sending a message through Facebook or Twitter is quick, simple, and allows you to attach additional media with less fuss than when sending texts.

You should already be using social media to communicate with customers, but avoid spreading yourself too thin across them all: find the networks with the greatest concentration of customers and focus on them. While you may want to maintain profiles on a wide variety of networks, don't just share the same posts across them all; tailor your posts to the biggest active demographic.

Encourage your customer service operators to aim for fast responses: the longer customers (existing or potential) have to wait for answers to questions or complaints, the less likely they are to trust you. You should also make sure you're responding to feedback: listen on social media as much as you talk, if not more so.

3: Make Communications as Simple as Possible

You need to talk to your customers where they are – and today they spend much of their time using social and mobile applications and perusing websites. It’s kind of odd to expect these customers to pick up a separate phone and start all over again when they want to talk to you.

Today’s real-time communications technologies, including new WebRTC capabilities built-in to browsers like Chrome and Firefox, make it easy for you to include voice and video right in the context of your own applications and websites.

And the numbers show that your customers are spending more and more of their Internet time on mobile devices – so you need a strong mobile application strategy. Luckily there are toolkits available that allow you to embed voice and video right into your mobile applications too. And companies like Agora.io can also provide services in the cloud to help you seamlessly connect with mobile users worldwide while maintaining high-quality calls.

Allowing customers to enjoy audio or video calls with real customer service representatives from within your applications will help them put a face and personality on your business.

4: Make Honesty Your Policy

The internet has given consumers more of a voice and also made they much more business savvy. If a company is lying or trying to con them, they will make sure others find out about it across social media, blogs, and other outlets.

Building a stronger bond with your customers comes down to trust: if your target demographic feels they have little or no reason to take you at your word, why should they continue to give their money to you instead of to your competitor?

When communicating with customers (via social media, email, phone, or Web RTC), show compassion towards their specific needs and circumstances. Maintain your integrity by delivering products, services, or responses when you say you will and focus on leaving a good impression on customers rather than chasing the next dollar.

If you need to give something for free to maintain loyalty and boost your reputation, do it.

5: Focus on Inbound Marketing Rather than Outbound

Outbound marketing is, essentially, based around interrupting (or even intruding upon) your customers' days: whether this is through TV ads, non-requested marketing emails, unauthorized text messages, or pop-ups on unrelated websites, such tactics seem to annoy more than entice.

If a member of the public receives so many intrusive ads from a company, they will be left with a bad taste in their mouth, and as a result, they will be highly unlikely to seek out your business anytime soon.

Inbound marketing (also known as “pull marketing”, rather than the standard “push”-based practices employed by some companies) can be much more rewarding and build trust with your customers.

How can you try this for your business? Create valuable content to solve clients' problems: blog posts, downloadable e-books, videos, podcasts, and more can all offer helpful information (such as providing insights into production processes, assistance with a particular piece of software, or anything else relevant to your business).

If this material is good enough, customers may also share it with others, leading more traffic your way and potentially boosting conversion rates. According to research, inbound marketing costs an impressive 62 percent less than outbound marketing on a lead-by-lead basis.

Building stronger bonds with your customers is vital to ensure longevity and loyalty, so invest time, effort, and resources into discovering what

they want. The more you can tailor your services and/or products to your target demographic, the more of a return you are likely to receive.

5.6 WAYS TO ENSURE SUCCESSFUL STRATEGIC ALLIANCES

Businesses often work together on projects, Business Exponential, advises entrepreneurs about the ways they can get off the hamster wheel and run like a well-oiled machine. Her advice can often mean forming alliances with other firms.

"Alliances can be tricky," Kaufman sighs. Alliances must foster mutual benefits and can exist only as long as they are advantageous to both parties. The concept of gaining a marketplace advantage by teaming up with another company whose products or services fit well with your own is not only seductive, but it's also critical for an increasing number of businesses.

Here are some rules of the road.

1) Identify the Need: "First, determine why you would work together," Kaufman points out. Do your companies have complementary skills or are you adding extra capacity to each other? Understand the strengths and weaknesses of each firm. Determine how the alliance fits into your business plan. Be clear with yourself about why you're entering into the partnership and what you expect to gain.

2) Evaluate Partners: Even when you know someone or get a referral from a trusted advisor, researching a prospective partner is crucial. It's not just the capabilities the other company brings to the table. You must feel comfortable with the work style of the potential alliance. Once you've determined the other firm has complementary skills, it's critical that you look objectively at management styles, work ethics and values, and identify where potential clashes could occur. Key questions to ask:

- How are decisions made? Who owns the relationship with the client?
- Who is paying whom? If you're not in charge of payment, how fast will they pay you and other vendors?
- What is the company's work ethic? At what pace is work done? Is it similar to yours?
- How competitive or aggressive is the company? How does that compare to you?

Answering these questions honestly leads to a better match. Some companies, for instance, are known for their tight rein on employees or the long hours they keep. If your work style isn't similar to theirs, you could be headed for problems. While it's smart to get references from people who have worked with your potential strategic partner, references often fear legal retribution so they may not provide a full picture of the company, commented Kaufman. "Do a Google search to see if there are any negative reports online or lawsuit filings."

3) Establish Joint Objectives and Goals: Developing key objectives and goals that reflect what both parties expect to gain is critical. Be sure that expectations are realistic in light of the resources both parties are willing to put forth, and make adjustments as needed. Nothing sours an alliance faster than the notion that one party is giving everything while the other is getting a free ride. Strategic partnerships have to foster an environment in which both parties gain something; otherwise, they're not partnerships.

4) Define Roles and Responsibilities: "Many problems can be avoided by setting expectations upfront," Kaufman advises. Assess each company's strengths, and define responsibilities accordingly – especially in the area of management. Many alliances fail because of poor management relationships, so document clearly what's expected. Be specific: Decide how many people from each company will be involved in the alliance and what their particular roles will be. Each party has to dedicate resources to the relationship, and both parties need someone within their organization who will champion the cause.

5) Develop a Good Communications Process: Clear communication is key to creating an enduring partnership. "This is one of the key pieces that often gets overlooked," said Kauffman. Disappointments and misunderstandings can be avoided by establishing an effective process for working with your partner. The relationship must be developed to the point where both parties can be honest when evaluating progress and offering recommendations for improvement — both of which should be done on a regular basis. For example, you might want to exchange weekly sales reports.

6) Develop Conflict-Resolution Systems: An alliance is rarely a match made in heaven. Misunderstandings, compromises, and disagreements are natural. "Determine how you will voice them when you feel your partner isn't responsive," said Kaufman. When misalignments arise, resolve them as quickly as possible. It's best to meet in neutral territory where both parties can speak openly and honestly. Then, focus on creating solutions rather than placing blame. Be prepared for the possible break-up of the relationship. "Have an exit process worked out in advance."

7) Build on Trust: Strategic alliances are built on trust, dedication, and mutual interests. They require the respect and interaction of people in each organization. And, like good personal relationships, they require effort to build. Once they're in place, however, you can count on them.

Each party has to feel that he or she is giving something and getting something in return. If you haven't taken the time to think through how both sides will benefit, don't pursue an alliance at this time.

8) Demonstrate Commitment: The alliance needs to assume a position of status and importance. Both partners must be willing to nurture and care for it. This means that the top people in both organizations must be supportive. The point of any strategic alliance should be to make an impact, and you can't do that without active engagement at the top. It also means giving extra effort to making the venture work, even if that means a

willingness to go beyond contractual obligations. Committed partners dedicate resources and energy, and face risks to make the venture work.

9) Be Patient: Strategic alliances take time to develop and maintain. When you're starting, don't make judgments about potential partners if they seem reluctant. Figure out how to stand out from the crowd.

10) Formalize with an Agreement: A written document formalizes what you have agreed to. It is an outline of expectations and protects you and your alliance if those expectations aren't met. If a disagreement arises, there is a document you can refer back to in order to get the relationship back on track.

5.7 BUSINESS ALLIANCE BREAKING

Partnerships are great, but the needs of your organizations might not match up forever Sometimes the strongest of alliances simply don't last—even when there's a clear industry benefit to keeping a united front.

According to a recent global survey on post-merging integration carried out by A.T. Kearney almost 70 per cent of the mergers world-wide have failed to achieve the expected benefits and create value for the companies and their shareholders. In South-east Asia, the proportion of success of mergers is only 24 per cent.

The study covering all 1,000 significant mergers of $50 million and above in the past ten years looked at key parameters like market capitalization and profitability prior to the deal and two years after the deal was closed. The survey noted that if a merger was unable to deliver the expected benefits within 18-24 months, the likelihood of its ever delivering them went down.

According to the study, mergers failed to yield the expected benefits because of execution rather than strategic resources. As much as 58 per cent of the respondents identified under communication as the main problem.

But other problems identified by the respondents in the survey included too many compromises in the new organisational structure, inadequate strategic thinking, absence of master plans, lack of momentum, lack of top management commitment and lack of speed in implementation.

Many more reasons may be ascribed to failure of alliances. However, the true causes of alliance failure can often be hidden behind their partnership. This is possible particularly when the skills and competencies of one of the partners are tacit and deeply embedded in complex organizational process making it difficult to learn or emulate while those of the other partner are explicit and embodied in specific individual machines or drawings making it easy to emulate.

Absence of mutual respect and trust has been another crucial reason for the failure of partnering relationship. Without these two critical elements

the partners forget about any positive relationship evolving. For all outward appearances, both Apple and IBM made every effort to convey that both ingredients were present in their blossoming strategic alliance.

Cultural assumptions can sometimes make it very difficult to recognize or acknowledge who has formal decision rights. For example, when Honda invested heavily in an extensive relationship with British automaker Rover, workers and managers of the two companies developed very positive working relationships for more than a decade. Another strategic aspect of alliance planning is to identify and choose the most potent partner. While doing so, due consideration needs to be accorded to the partner's expectations, business processes, financial, technological, managerial and marketing strengths, and its behaviour so as to ensure that the partner's aspirations are in sync with those of the firm and his business strengths complement and supplement the firm's existing competencies leading to synergistic benefits to the alliance venture.

Such an analysis will result in evolution of commonly agreed vision, mission, corporate objectives and strategies for the realization of which alliance partners would be striving relentlessly. Alliance among BPL, Birla, AT&T and Tata, for example, has had shared vision of creating mobile giant.

This project provides opportunity to the partners to work together and learn from each other and furnishes basis for measuring performance. There should be an agreement between the partners regarding the resources-financial and physical-to be deployed by each partner in the venture. Issues like ownership and management should be settled so as to avoid any possibility of break out of the alliance in future.

Specific agreement has also to be made about the continuing independence for the alliance partners. This will maintain and deepen the relations. These details along-with others should be gingerly discussed and finalized otherwise alliance may soon be found in deep trouble.

So as to ensure that the alliance works successfully, the management should evolve suitable structure, develop effective communication system, design appropriate incentive system and secure commitment of the organizational people. So as to effectuate alliance strategies and realize the vision, stunningly alacer and agile structure, that meets the needs of the alliance and not the needs of individual partners needs to be developed.

5.8 REASONS FOR ALLIANCE FAILURE

Earlier research indicates that alliances fail for a variety of reasons:

- Differences in culture
- Incompatible objectives
- Lack of executive commitment
- Ineffective governance structure

- Poor alliance leadership
- Overestimated market potential

Proper preparation, alliance management & communication can prevent most of these reasons. The ASAP report hints to the fact that ASAP members have a better success rate than non-members do. These companies have made investments in building up the skills and competencies before approaching alliances. Subsequently, they create and manage alliances in a structured way, often based on an alliance life cycle based methodology.

Also, the report shows that companies new to alliances, and hence less experienced, potentially have a higher failure rate than organizations with an established, experienced alliance management capability.

5.9 CASE STUDY: THE STRATEGIC ALLIANCE BETWEEN RENAULT AND NISSAN

Renault and Nissan are two major automobile brands working independently as well as are in a 19-year old alliance where Renault holds 43.4 percent stake in Nissan and Nissan owns 15 per cent in Renault. The Renault-Nissan Alliance is the first of its kind involving Japanese and a French company. Renault was identified for modern design and Nissan for the excellence of its engineering. The two companies had just decided to a most important strategic alliance in which Renault would take for granted $5.4 billion of Nissan's Debt in return for a 36.6% equity share in the Japanese company. Before the alliance it was concluded that the combined company would be the world's largest car-maker.

In the case of Renault-Nissan, it is preferable to have an alliance than merger for many reasons. Alliances would facilitate more than mergers the entrance for companies to new geographical phases where there are some restrictions on foreign investments. The two companies had their own capabilities in their own market. Renault for instance, already existed in Europe and North America, and was well-known for its design and marketing. At the same time Nissan was the powerhouse engineering in Japan, Europe and North America. Therefore, there was a good chance for Renault to enter the Japanese market where there are many barriers from the Japanese government.

synergy however, is vital for alliance. Alliance would be more rational when the two firms look for further synergy in their financial, technological aims. This synergy between two companies was the key element for choosing Nissan-Renault alliance. According to Carlos Ghosn, the manager of the Renault-Nissan alliance: "we said from the beginning that we were not looking for a merger, but rather to get greater value from synergy between the two companies". According to Ghosn, the reason for choosing alliance rather then merger was that both companies were looking for "turnaround". Although alliance was more risky than merger,

yet they chose it because they thought it would give them more opportunities to develop.

However, despite the advantages Nissan-Renault gained from the alliance, they faced challenges. One of the challenges is whether the alliance would lead to an increase or decrease in the price share. This was a real challenge for Nissan, whose share price fell when it entered the alliance. Furthermore, the two companies had a challenge of cross-culture problems. However, with their ability to focus on the work objective they were able to succeed.

5.9.1 Renault: Before and After the Alliance

The alliance between Renault and Nissan was an outstanding paradigm of a successful alliance around the world. However, before 1999, the prospective of forming an alliance between these two firms was not such rosy.

From Renault's point of view, various factors were strengthening the former opinion. Firstly, Renault was recovering during 1996 and 1998-9 turning losses of US$680 million into combined profits of US$1.65 billion. Moreover, the failure to merge with Volvo in 1995 had left its mark on the company and any further attempts to a new alliance were confronted distrustfully. In addition, the fact that both firms were playing a dominant role in the auto industry of their countries was indicating that a potential alliance was going to collapse in a decision-making stalemate.

Nevertheless, the supporters of the latter argument were gainsaid. The mutual benefits that they were going to absorb from the alliance laid aside the potential problems and both parties focused on the success of the alliance. This was a crucial challenge, which they managed to handle by learning to trust each other, be truthful and honest during the negotiations. Additionally, by forming joint study teams, in order to test their companies' ability to work cooperatively, they minimized the cultural stereotypes and set the base for exploiting joint synergies. The two companies were so complementary in terms of geography, product ranges and personality that inevitably the future was foreboding promising. Besides, this process gave Renault an advantage over competitive suitors such as Ford and Daimler-Chrysler, which focused only on finding synergies on past and current advantages rather than on a prospective productive future.

On this basis, Renault, through the alliance with Nissan, achieved to gain international structure which enabled it to deal successfully with the changes which were taking place on the world automobile stage. Thereby, Global synergies and the expansion of its production to foreign , until then, markets like Japan, North America and Asia enhanced its potential and made it a countable member in the auto industry.

5.9.2 Nissan: Before and After the Alliance

Nissan's history starts from the early of 1933. Nissan is a Japanese automobile manufacturer which achieves, through the years to have strong market presence in Asia and US. Except for the fact that Nissan was a highly emblematic symbol of Japan's industrial strength, had also a number of strong points such as technological and engineering competence, and also was good at making large cars.

In late March 1999 Nissan and Renault sign an agreement for a Global Alliance. Aim for this agreement was to provide an advantage and achieve profitable growth in both companies. However, Nissan was nearly bankrupt and faced significant debt problem when the alliance formed. One of the major reasons for this debt and financial difficulty was the fact that Nissan invested a lot of money in different companies and this has a result, Nissan not be in position to invest money in the company and its products. Therefore the company for a long time did not have any profit and this made the debt for Nissan in 1999 to reach the US $22 billion. Furthermore, during the same year (1999), the domestic market share had fallen from 17.4% to 13%.

Have in mind this and after that Daimler Chrysler and Ford refused the idea of a partnership and broken of the alliance talk with Nissan, the company resorted to the strategic alliance with Renault, where both companies had clear idea of what they wanted. The alliance was vital for the two companies as Nissan needed Renault's cash in order to reduce its debt problem and Renault wanted to learn from Nissan's success in US and Asia which was essential for the expansion in its market. During the period of social initiation process, of six months, many advantages arose over competitors as they carried out static analytical evaluations and they focused on finding collaborations based on their past and current strengths rather than on jointly future.

In order to accomplish this, Nissan had change significantly to redeem its profitability and competitiveness. First Nissan quit the investments in other companies, in other words the keiretsu which is "a Japanese traditional rule" that requires all the companies in Japan to have long-term purchasing relationship, intense collaboration and frequent exchange of personnel and technology between companies and selected suppliers. The personal management also had changed and whereas Nissan in the past appraised their employees based on the period that they were working for the company, now they changed the criteria of evaluation by looking on the performance of each employee. Further they set up a common language i.e. English and they have created nine Cross-functional teams. By the implementation of the above changes, Nissan manage to cut down in purchasing cost, to reduce suppliers, to close overlapping outlets and plants and finally to reduce the work force.

Through the alliance of Nissan and Renault, the benefits that arose were obvious and determinant. Transparent bench-marking allows two culturally diverse companies to share best practices and also the common

platform and shared purchasing strategy had delivered huge cost of savings. Noticeable is the fact that in order to preserver corporate identities they decide to remain as separate managements, separate brands and separate companies while every decision was affecting both brands.

The operation recommendation which arise from this alliance case provide valuable elements on how two companies, that are in the same situation like Renault and Nissan which show strength in different competence and regions of the world (Nissan had strong presence in Asia and US while Renault had presence in Europe), can approach the growing and competitive auto manufacturing global market.

Therefore, the success of this alliance is also interrelated with the synergy among the two companies and the framework of equality help the transfer of knowledge between foreign engineering teams.

5.10 POINTS TO REMEMBER

- Strategic information system **provides a connection between demands of organization and latest information technology**. This tactic helps an organization to get hold of the market by utilizing Information tech to meet its challenging requirements to the continuous variation in the corporate environment
- Strategy = Formulation of basic organizational missions, purposes and objectives; Policies and program strategies to achieve them; and the methods needed to ensure that Strategies are implemented to achieve organizational ends.
- Customer bonding is the process through which a company gets closer to its customers; the goal is to make customers feel welcome, valued, and heard at all times.
- Customer retention is vital to any company because a loss of customers equals a decline in revenue; losing too many customers could mean the demise of a company.
- **Setting up a customer feedback page on a website or a telephone system with a customer service agent enables customers to express concerns or ask questions and to feel heard and valued.**
- Alliances must foster mutual benefits and can exist only as long as they are advantageous to both parties.
- Strategic Alliances help both the entities in agreement to gain/leverage from the expertise possessed by another one. Since it does not necessitate the creation of a new entity, both the entities can continue to undertake their core activity independent of SA. Entering the right kind of SA reduces the costs and, in a way, enhances the shareholders' value.

5.11 QUESTIONS

- Study and discuss the Alliance between any two companies.
- What is strategic Alliance?
- How customer Bonding is important for Business Growth?
- What Factor's for Breaking business Alliance?

5.12 REFERENCES

- Strategic Management and Business Policy: Globalization, Innovation and Sustainability | Fifteenth Edition | By Pearson
- Strategic management author: **pearce**
- Management Information Systems: Managing the Digital Firm by Kenneth Laudon (Author), Jane Laudon (Author)
- https://www.wiley.com
- https://www.academia.edu/9464635/Strategic_Roles_of_information_Systems_Introduction

6

BUSINESS PROCESS REENGINEERING PROCESS

Unit Structure

6.0 OBJECTIVES

- To understand the Concept of Business Process Reengineering Process
- Explanation of How Business Process Reengineering works?
- Challenges that impact the implementation of business Process Reengineering
- What Is a Virtual Business?
- How does internet technology improve productivity?

6.0 INTRODUCTION TO BUSINESS PROCESS REENGINEERING

Business Process Reengineering involves **the radical redesign of core business processes to achieve dramatic improvements in productivity, cycle times and quality**. In Business Process Reengineering, companies start with a blank sheet of paper and rethink existing processes to deliver more value to the customer.

Business process re-engineering (BPR) is the act of changing an organization's major functions with the goal of increasing efficiency, improving product quality, and/or decreasing costs. This starts with an in-depth analysis of the business' workflows and identifying key areas that need improvement. People who do this kind of work, often referred to as BPR specialists, are hired by companies to facilitate transitions to more standardized processes.

Business process re-engineering definition is fundamental rethinking and redesigning of business processes so as to attain vivid improvements in all the critical aspects like service quality, process outcome, cost, and process speed.

Business process reengineering (BPR) intents to cut down the enterprise costs and reduce the redundancies and repetitions within the process on a large scale. Business process reengineering gained popularity in the world of business in the 1990s. The concept was introduced inspired by an article called 'Reengineering Work: Don't Automate, obliterate', published in the Harvard Business review by Michael Hammer.

He developed this concept because he observed that most business houses were integrating new technologies with the pre-existing fundamentally inefficient processes. Nobody even bothered to think of creating something new and different, based on the advanced new technologies.

They used technology just as a means to automate their existing systems and processes, rather than modifying anything in the process. This can be thought of as using technology in order to "upgrade" a horse with lighter horseshoes to make them run faster, instead of building a car.

The process of Business Process Reengineering (BPR) start just with a blank sheet of paper, where you rethink and observe everything about the existing processes to make it more value-aided and beneficial for customers.

This new system is primarily focused on increasing emphasis on the customer needs and values. organizations work to minimize the layers within an organization and cut down the unproductive activities in two major areas:

1. Redesign and redraft functional organizations into cross-functional teams.

2. Effectively use technology for the improvement in data distribution and decision-making.

And more and more technological advancements every day, BPR is gaining a lot more popularity and relevancy with each passing day.

5.2 BUSINESS PROCESS RE-ENGINEERING STEPS

business process re-engineering is not an easy task to perform. BPR works to changing the complete course of the said processes at the core. This makes it extremely risky, laborious, costly and time-consuming process.

You need to be capable enough to manage and carry out each and every step carefully and successfully. You may face many failures in your attempts to make a reasonable and beneficial change in the processes.

Here are certain steps to follow for efficient Business Process Re-engineering:

- **Step #1: Identify the Need for Change and Communicate**

For small startups, this step is probably very easy. You can go for BPR when you realize that your product is receiving a huge user drop-off rate. Then, the next thing to do is informing the co-founder, suggest a direction to spindle and you are good to go for the further steps.

For a large business, the first step is the biggest hurdle itself. You will always find individuals who are satisfied and happy with the existing ways of working. These individuals can be both, from management side and the employees. The management will most probably be afraid of getting their investments sunk, and the employees might see it as a job security threat.

Before anything else, you will have to make up their minds and convince them why the change is required for the firm. This shouldn't be difficult if your company isn't doing well.

Perform a thorough research and try answering these questions in case of dilemma: Which of the processes might not be efficient? Where are you lagging behind of your competition? Are you even part of the competition or is the condition worse?

- **Step #2: Build a Great Team of Experts**

Business process re-engineering demands a team of highly motivated, and skilled team of individuals who has the potential to carry out all the needed steps involved.

The team of experts majorly consists of:

Senior Manager: For supervision and calling out the shots for taking major decisions. If your BPR team doesn't have anybody onboard from the senior management, then they will have to get their approval for every little change.

Operational Manager: He is the one who is aware of the ins-and-outs of the process. Their process knowledge can prove to be a great asset to build a new, effective and more efficient process.

Reengineering Experts: They are the ones who expertise in the field from IT to manufacturing. They will discover where and how the right changes should be implemented to yield the best outcomes. The changes might be anything – software, workflows, hardware, etc.

- **Step #3: Define Key Performance Indicators (KPI) for the Inefficient Processes**

After the team is ready and you are all set to launch the initiative, there will be the need to define the correct Key Performance Indicators (KPIs). BPR is introduced to optimize your process. Formulate BPR strategies that can bend as per your business requirements and, not the other way around.

KPIs usually differ a lot depending on the type of process you're optimizing. And the following are the most typical ones:

Manufacturing

Cycle Time – The total time taken from initiating to concluding a process.

Changeover Time – Time in between required to shift the line from making one product to the next.

Rate of Defect – The total percentage of defective products manufactured.

Inventory Turnover – The time taken in the manufacturing process to convert inventory into products.

Planned VS Emergency Maintenance – The proportion of the times when planned maintenance and emergency maintenance happened.

IT

Mean Time to Repair – The average time spent to repair the app, software, or system after any emergency.

Support Ticket Closure rate – The ratio of number of support tickets closed by the support team to the number opened.

Application Development – The time spent on completely developing a new application from the scratch.

Cycle Time – The time required to get the network back up after a security fissure.

Perform business process mapping to know exactly where the KPIs need to be defined in the individual processes. Use the step-by-step strategy to perform BPR effectively.

You can map out the processes using 2 ways:

1. Process Flowcharts – It is the most basic technique. Just grab a pen and a blank paper and jot down the processes stepwise.

2. Business Process Management (BPM) Software – Technology makes anything easy! Using a BPM software for process analysis makes everything clearer and easier to work with.

For example, you can use BPM software, process digitization, setting deadlines, etc. Such software will most probably lead you to optimize the said processes since it allows easier collaboration among the employees.

- **Step #4: Reengineer and Compare KPIs of the Processes**

After the all the above steps, it is important to perform A/B testing to check the working and efficiency of the new process. Start by implementing the modifications and solutions on a significantly small scale.

Now all you are left to do is – put up your theories into practice and see how the KPIs are holding up. Once you realize that the new solution works better, and start scaling the solution gradually. Eventually put it into action within other company processes as well.

If the new solution doesn't prove to be that fruitful, then you need to start the process all over again. The cycle of finding loopholes and solutions to them repeats until you form a desirable, effective process.

5.3 WHAT ARE THE ADVANTAGES OF IMPLEMENTING BPR IN YOUR BUSINESS? |BENEFITS

There are many benefits of business process re-engineering to your business. Some of them are as follows:

1. Cost-cutting and reducing cycle times

Business Process Reengineering eliminates all the unproductive and futile activities within an organization. This drastically reduces the costs and cycle times for the employees performing them. With team reorganization the need for management layers is eradicated.

This also enhances the flow of information eliminating the errors and rework efforts required due to multiple handoffs.

2. Improve work, product and service quality

Business Process Reengineering minimizes work fragmentation and establish clear responsibility and ownership of the processes. This impacts the overall process effectively. Performance measurement can be evaluated easily with a prompt feedback and this allows workers to gain insight on the output responsibility.

Let's look at some of the tangible benefits of business process re-engineering:

- Integration within the organization.
- Empowered employees.
- Reduction in the process steps.
- Natural order of process steps followed.
- Process transparency increases.
- Drastic reduction in the manufacturing costs.

5.4 BUSINESS PROCESS REENGINEERING: BENEFITS AND CHALLENGES

Business Process Reengineering can be defined as the process of recreating a core business process with the aim of improving the product/service output, quality and reducing wastage and cost incurred.

What exactly it involves is the analysis of company workflows, finding processes that are not meeting the requirements or inefficient which you are attempting out ways to get rid of them or change them.

With pandemic hitting every business hard, organizations of all sizes and types are faced with intense competition. To stay afloat in this competitive environment, these organizations look for the way out to increase efficiency and improve their bottom line by turning to process improvement through Business Process Reengineering.

Business Process Reengineering can be as simple as shaping unclear processes and continually looking for areas of improvement and making critical changes which can be as complicated as reengineering ventures.

Let us dig into some of the benefits of Business Process Reengineering implementation:

- **Flexibility**

The only thing that is permanent is change and even organizations fall in this criteria and are regularly faced with the need for change. Changes may become essential because of many reasons like new regulations, technological innovations, market demands or the advent of new ways of working.

One of the key features of Business Process Reengineering is that it promotes the design of processes with minimum costs. Most of the related processes can be easily customized to suit the requirements of your organization.

- **Enhancement of Productivity**

Business Process reengineering focuses on the automation of a lot of repetitive elements within regular business workflow. The business process improvements basically include removal of process bottlenecks, initiation of parallel processing, and complete elimination of redundant steps. All these improvements can be easily achieved with Business Process Reengineering, which will thereby allow employees to spend more time on important activities. Since the support functions have been handled, it can result in increased productivity and reduced waste.

- **Reduced Risks**

The visibility of business processes in the business process reengineering allows for concentration on inefficiencies. It gives organizations the opportunity to work more efficiently whereby they can save their resources. Business Process Reengineering is also responsible for the creation of better- designed, executed and monitored processes which tends to reduce the operational risks like fraud.

- **Transparency**

There are certain industry regulations which the organizations need to comply with. Business process reengineering ensures that the organizations remain transparent and implement the regulatory requirements at ease through which delays in compliance and any associated fines and penalties can be prevented. When you integrate compliance into the process life cycle, you automatically make the organizational processes transparent and visible to all your employees.

- **Employee Contentment**

Business process reengineering removes a lot of red tape in the organizations, thereby allowing employees to focus 100% on their work. This process automation eliminates a lot of repetitive work which again makes access to information easier and results in increased productivity and a happier workforce.

- **Improved Customer's Attention**

With simplified processes and increased productivity, employees get enough time to focus better on the customer. The employees will be in a better position to respond to customer's proposals instantly, build solutions faster and customize their requirements. Business process reengineering is responsible for bringing people and technology together that again in a way, increases customer satisfaction. Also, employees are able to deliver the right results for customers and related stakeholders.

- **Consistency**

With Business Process Reengineering, every task can be executed exactly the way it was planned and designed. There will be no requirement to reinvent the wheel as similar problems can be addressed in the same way even if the roles get changed. Also, exceptional situations and responses are noted down to ensure that they are handled appropriately.

- **Durability**

With the change in the organizational conditions, the business processes require to adapt to those changes and deliver the expected results. Business Process Reengineering helps in smooth adaptation while maintaining control and managerial oversight as well.

- **Evaluation**

Processes, when measured and evaluated end-to-end and compared to the expected results, can help in managing people well. Business Process Reengineering provides reporting and analytical tools which can help in making executive decisions. It also helps in streamlining and quantifying processes that can help the organization to optimize its workflows.

- **Integration of Technology**

Business Process Reengineering bridges the gap between users and IT by using various standards of business process management. The focus should always be on processes and not on applications that support them.

5.5 CHALLENGES THAT IMPACT THE IMPLEMENTATION OF BUSINESS PROCESS REENGINEERING INCLUDE:

- **Lack of knowledge**

The team you are working with must be clear on where to implement the reengineering processes and apparently why. Proper prioritization of different business process for reengineering must be considered.

The employees must be trained appropriately or retouched with substantial business process reengineering programs to gain the required knowledge in the field. In case the implementation is done on wrong processes, it could result in wastage of resources. The business can see the correct process implementation only through proper training, guidance and knowledge transfer.

- **Irregularity throughout the implementation and opting wrong direction**

Business Process Reengineering cannot be carried out with an instant competitive advantage. The entire process must be followed bit by bit for the visible growth. But this does not adhere that reengineering has to be done for every process in the organization, there might be some exception where it is not suitable.

Also, once the company achieves the desired benchmark, the business process reengineering practice should not be discontinued because an irregular reengineering process can hinder a lot of opportunities and growth that comes along. There should be predefined objectives and expectations in place.

- **Inappropriate Team Formulation**

A constant look must be put on for latest updates, if any, by the well-defined team on various process reengineering practices. Not just the correct knowledge but the inclusion of the right set of the team is vital both for the operation and management.

The team must be properly structured in which at least a senior or operation manager be allocated who is expert in business process knowledge. You can complete the team with experienced engineers for every single field such as from manufacturing or IT. This will enable constant supervision in the right set direction.

- **Wrong placement of resources**

Lack of essential resources can completely disrupt the bridge between the organization and the reengineering process, so getting this right is the first step. You must see to it that proper resources are readily available when there is a requirement.

The list of things you must check beforehand is skilled human resources, sufficient funds, correct set of Business process reengineering tools, vast knowledge of the processes, experienced players in the system, timely approval and you are good to go.

- **Faulty analysis and lack of support from team members**

The process milestones should always be analyzed and established in advance. You must ensure that the data and essential information for the procedure is accessible to the entire team. Make the team abreast of the priorities so that the work is well-coordinated without wasting any time.

The work carried out must be relevant, and the team members should be more transparent on why a specific process is required instead of focussing on how the process can be undertaken. Often businesses face challenges in channelling the Business Process Reengineering steps.

The responsibility lies on the organization as a whole and not just the Business Process Reengineering team for a particular decision made.

Hence, it can be precisely said that failure may be the result of lack of organizational readiness for change, lack of purpose to move past the traditional methods and age-old comfort zone, lack of commitment, leadership and efficient planning.

When employees in the company are not skeptical about the Business Process Reengineering success only then, they can develop understanding toward working on a particular goal.

5.6 EXAMPLES OF BUSINESS PROCESS REENGINEERING

The past decade witnessed significant changes in the technological front, and with the pandemic, the development of new technologies became more evident. Many companies started carrying out business process reengineering activities. While there are a few catastrophic business reengineering examples, there are successful examples too in history. Ford, an automobile manufacturing company, is one of the famous among all.

The American automobile industry was undergoing a phase of depression in the year 1980. As a cost-cutting measure, Ford decided to scrutinize some of its departments in search of inefficient processes. In the process, they found out that their accounts payable department was overly crowded, consisting of around 500 people which was not at all required.

Ford management then outlined their goal and decided on to reduce clerical staff in the account payable department. Launching of Business Process Reengineering enabled them to figure out the reason why that particular department was overstaffed.

They analysed the workflow and completely recreated the process digitally and warded off the old manual payable process.

Similarly, you will find that large banks like HDFC vamped off the clerical staff by introducing Chatbot named EVA, which was India's first and largest artificial intelligence-powered banking chatbot to serve customers in a better way.

Eliminating the unwanted processes and introducing new initiatives is what Business Process Reengineering is all about.

5.7 WHAT IS A VIRTUAL BUSINESS?

A virtual business is any business that conducts all or most of its business via the internet. It may or may not have some kind of physical presence—such as an office or warehouse—but there isn't a physical location that customers can visit.

Here are the basics of virtual business, some examples of industries that are particularly well-suited to go virtual, and the pros and cons of making the switch.

A virtual business is one that focuses on its digital capabilities to scale back its physical presence. While virtual businesses are united in their efforts to move work online, they all retain different levels of physical operations.

In the most extreme example, all employees work virtually, and the "headquarters" is wherever the CEO lives. In less extreme examples, virtual businesses may still have a headquarters where employees work, or they may have a warehouse where employees prepare packages to ship to customers.

At a bare minimum, virtual businesses are defined by the lack of a physical location where customers can interact with the company face-to-face.

As anyone who has worked in an office can attest to, the vast majority of work can be completed with a computer. Virtual businesses take advantage of that by trimming unnecessary costs. This could include outsourcing nearly all of its business functions such as product development, marketing, sales, and shipping.

One of the easiest costs for many companies to cut is the overhead that comes with retail space. Businesses can sell their products online for a fraction of the cost that would come with opening a physical retail store.

Therefore, it's not surprising that virtual retailing is the most common form of virtual business. The earliest examples of consumer-facing e-commerce might be traced back to CompuServe's Electronic Mall, which was unveiled in 1984.[1] In 1994, the introduction of SSL security protocols made it much easier for the average consumer to stay safe while using their credit card to buy things online.[2]

The flurry of commercial activity swelled into what became known as the Dot-Com Bubble, but even after that bubble burst, companies like Amazon, eBay, and Priceline persevered.[3]

While the shift to virtual in the retail industry has been among the most noticeable trends of the digital era, many other industries are making the same leap. In general, the more work that's done on a computer, the easier that business can shift to a virtual business, so the IT sector has embraced many aspects of virtual business.

Software development firms commonly hire developers who don't live near the company's headquarters. They complete their section of code from home, send it to colleagues, and communicate about projects via email, video chats, and phone calls.

Customer service centers have another business model that lends itself to virtual business. Customer service representatives can answer calls and emails from home.

5.8 HOW THE BUSINESS PROCESS REENGINEERING WORKS? | METHODOLOGY

Business Process Reengineering (BPR) is a sensational initiative for change. Its methodology is based on five core areas, which are laid as follows:

- Refocus: Align company values with the customer needs and demands.
- Redesign: Draft and design core processes to enable improvements using information technology (IT).
- Reorganize: Convert individual teams into cross-functional teams to hold up end-to-end responsibility of a process.
- Rethink: Think about the basic organizational needs and issues people facing with the current system.
- Improve: Keep in mind all the business processes across the organization and work to improve them.

5.9 PROS AND CONS OF VIRTUAL BUSINESSES

Pros

- Brick-and-mortar cost savings
- Flexibility
- Happier employees
- Larger employee base

Cons

- Lack of institutional cohesiveness
- Potential communication issues
- Increased likelihood of lost productivity

Pros Explained

- **Brick-and-mortar cost savings**: Reducing the need for employee workspace and retail space saves money on overhead costs associated with physical businesses—also known as brick-and-mortar businesses. These costs include commercial building leases, utility bills, insurance premiums, and more.

- **Flexibility**: A less rigid organization can react faster to changes in the marketplace.
- **Happier employees**: Working from home creates a better work/life balance for staff.
- **Larger employee base**: Since employees can work anywhere, organizations can provide employment in rural locations or areas of high unemployment.

Cons Explained

- **Lack of institutional cohesiveness**: Employees being located in diverse regions, with possible language and cultural differences, can cause a lack of cohesive company identity and culture.
- **Potential communication issues**: A lack of face-to-face interaction between employees and teams can cause communications-related issues.
- **Increased likelihood of lost productivity**: It's harder to ensure consistent productivity from employees who lack self-discipline when they're working from How can internet technology improve business processes?

It's no mystery that technology has brought impressive changes. Most businesses wouldn't be able to run profitably without keeping up with changing technologies. But with internet and information technologies changing and developing constantly, you need to know what technologies are available to help your business work more smoothly and generate higher income**.**

The internet hasn't only changed the ways that business's function, it has also changed the ways people think. Consumers interact with brands and products differently to how they used to. Marketing has had to adapt very quickly over the past few decades as new avenues have become available. And businesses have had to change the way they function, interact with clients, and network in order to keep up.

Internet technology, when used correctly, will allow businesses to implement faster and more efficient processes. From strategising to marketing and beyond, internet technology covers every aspect of business. This guide will help you understand what internet technologies are available, how they help businesses, and how you can use them to improve your business processes.

With a better understanding of what internet technology is, we can start to apply it to business processes to improve business functionality. But to apply it properly, we need to fully understand business processes.

A business process is a series of steps carried out in any business to achieve a goal. These can be written into policy, done out of habit, or completely subconscious, but every business will have processes in place.

In larger businesses, these processes are broken down into smaller parts with different employees working on individual steps. In a small business or start-up, processes may be completed from beginning to end by the same person.

Once you have broken your process down into steps, you can start to see how each step can be made more efficient. This is often a good starting place when self-auditing your business to improve productivity. It is also the best place to start when looking for ways to introduce new internet technologies. This is because different software, programs, apps, and developments will have been created to help specifically with different steps in the business process.

With so many capabilities, the internet has many uses – not all of these will be beneficial to your business. Some internet technology will also benefit some business while being redundant in others. It all comes down to your business and what your business truly needs.

Some of the more popular internet technologies for businesses include:

– Communication tools: Especially with people working from home, communication tools including chat functionality, shared timelines or project goal maps, and video conferencing have all become vital to a lot of businesses. Online communication allows a more natural flow of communication than phone calls or emails alone. A lot of software has also been created specifically for businesses and allows colleagues or team members to see when someone is busy, if they're on a call, or if they are available to chat.

– Shared files: sharing documents in cloud storage allows multiple people to access the same data in real time and see changes as they are being made. This can clear up a lot of confusion and save time when it comes to looking through multiple versions of the same document to find the most up-to-date one.

Social media: Once viewed as a sap on time in the office, the business world has changed its view on social media and now recognises the vital role it can play in market research, increasing customer interaction, boosting conversions, and improving brand recognition. Most social media platforms also offer business capabilities designed specifically to help businesses use their platforms to become more efficient and profitable.

– CRM software: Managing databases is much safer online because developers can put far more defences into their software and keep them updated. Online CRM also allows you to store more information, know that it is GDPR and data protection law compliant, and rest assured that there is backup in case you lose any information. Stored information is also easier to find which makes business run more smoothly and customer relations more manageable.

– Market research: with online quizzes, surveys, and interaction tools with monitoring capabilities, market research is much easier online. See

exactly who chooses to interact with your business, how long they stay on your page, or ask them for opinions on your product. Gathering the data and compiling it is easier and larger datasets can be gathered than is possible with in-person market research.

How does internet technology improve productivity?

In business processes, one unproductive or slow step can slow down the whole process, jeopardising projects and timelines.

Internet technologies allow supervisors to monitor how staff are spending time, what they are working on, and how work is progressing. There are multiple task management tools available to help you track daily, weekly, and monthly responsibilities and targets to keep your team on track.

You can also use various technologies to set up reminders and prompts for certain tasks. This helps you and your staff stay on top of emails and other daily tasks while still making space for unique projects.

How does internet technology improve flexibility?

Within your business process there is always flexibility. If your systems are too rigid they won't allow for unexpected changes and will break down when challenges arise. Every step in the process requires a certain level of flexibility and adaptability.

Internet technologies have brought in flexibility in numerous ways, the most obvious being in the way people work. A decade ago most workforces would have needed to work from the same building and at the same time for business to run smoothly. With new internet technologies, those same workforces can work from anywhere and at any time and still be as productive – if not more – than they were before. This kind of flexibility works in both the business' and the employees' favour, and that, in turn, gives better service to your customers.

With improved communication, there is also more scope for quick adjustments to any aspect of work. Queries can be dealt with more efficiently, problems can be solved collaboratively and effectively, and there can be more flexibility overall in the way your business runs.

5.10 HOW DOES INTERNET TECHNOLOGY IMPROVE CUSTOMER SERVICE

No business can run without customers or clients, and customers are often the focus of many steps in the business process. If customers are not at the forefront of your mind when developing services and products, your business is unlikely to be successful.

Internet technologies allow you to engage more meaningfully with customers at all points along your business process. Starting with market research and brand engagement and leading to after-sale and customer support, technology has made it easier for customers to contact and

interact with businesses. Using technology like artificial intelligence online chatbots, online customer support, and social media, you can help your customers stay connected and feel heard. The simple act of making your business available for interaction can often set you apart from aloof competition.

More frequently now, people are turning to brands they trust. A large part of that trust is built on a perceived relationship. Using internet technology to improve overall customer service and communication will enhance your business and lead to greater success.

How does internet technology improve marketing?

Marketing is key in any business and a lot of time will be spent on working out the best leads or most appropriate campaign. In bigger businesses, entire marketing teams will be devoted to the marketing process which includes properly understanding customer needs and keeping abreast of changing trends and advertising opportunities. If the marketing part of your business process breaks down, you are unlikely to make sales and your business will suffer.

Internet technology has the advantage of being highly intuitive as well as being able to gather and process mass data quickly and efficiently. With these tools fully accessible to businesses, you can not only understand your market, but very easily create marketing campaigns that target the exact area of the market you are interested in – be it existing customers or new market areas.

Software is available for building websites without existing coding knowledge, and eye-catching graphic design tools are available for creating promotional materials. In addition, most social media platforms allow you to advertise for free, or give you the option of targeted marketing for a fee. This means you can make the marketing work for you on whatever budget you are operating on.

How does internet technology improve safety?

Keeping physical data is risky. Businesses that only use physical data run the risk of losing information if it is not stored in at least two different places in case of fire or other damage. Physical data is also often difficult to handle and it can take a long time to pull up specific information, especially if a lot of people are involved in the filing and handling of data. With strict laws around data protection, it can also be difficult to properly protect physical data.

Internet technology makes handling data easy and secure, which protects your business and your customers. Advanced coding is used to restrict access to files that need to be protected, while allowing a select few to access the information that is needed. Software designed for business data is also designed with an understanding of business and legal needs so you can be assured that your information is stored legally and securely.

Most software also comes with encryption on passwords, files, and messages. Encryption makes it difficult for hackers to access the information that is stored and adds another layer of protection.

Because data is used in every step of any process, having the right technology to gather, store, handle, and delete data can save you a lot of time and a lot of money.

5.11 STRATEGICALLY BUILDING KNOWLEDGE AND CREATING COMPANY –

Managing your company's knowledge more effectively and exploiting it in the marketplace is the latest pursuit of those seeking competitive advantage. Knowledge and other forms of 'intellectual capital' are the 'hidden assets' in a company. They do not appear on the balance sheet in annual reports, yet they underpin value creation and future earnings potential. Knowledge intensive companies, like Microsoft and Glaxo Wellcome, have market values at least 10 times the value of their physical assets.

The Knowledge Advantage

How can companies use knowledge to secure a strategic advantage? In a nutshell, its about generating greater value through the knowledge in products, people and processes:

Knowledge in Products: 'Intelligent' or 'smart' products can command premium prices and be more beneficial to users. One example is the 'intelligent' oil drill that bends and weaves it way to extract more oil than ever from the pockets of oil in underground formations.

Knowledge in People: "Our most valuable asset", according to many company reports, although the actual way they are treated and managed often belies this. 'Learning Organisation' programmes, such as that at Anglian Water, is one way of nurturing and applying underutilised talent.

Knowledge in Processes: In many companies there are often differences in performance levels of 3:1 or more among different groups performing the same process. Closing such a gap saved Texas Instruments the cost of one new semiconductor fabrication plant (a $1billion investment).

These are not the only ways that companies are creating strategic advantage through knowledge but give a flavour of what is possible. Others include active management of your intellectual property portfolio of patents and licences, and creating new businesses that exploit your internally generated information and knowledge.

Two Thrusts of Strategy

What strategies are companies adopting to maximise the returns on their knowledge asset? In a year long study of international best practice two types of strategy were found. The first is to make better use of the

knowledge that already exists within the firm, for example by sharing best practices. Very often leading managers comment: "if only we knew what we knew". Too frequently people in one part of the organisation reinvent the wheel or fail to solve customer's problems because the knowledge they need is elsewhere in the company but not known or accessible to them. Hence, the first knowledge management initiative of many companies (between a third and a half according to surveys) is that of installing or improving an Intranet.

The second major thrust of knowledge focussed strategies is that of innovation, the creation of new knowledge and turning ideas into valuable products and services. This is sometimes referred to as knowledge innovation. Many managers mistakenly believe this is about R&D and creativity. Our

research found no shortage of creativity in organizations. The real challenge is not to lose these creative ideas and to allow them to flow where they can be used. This needs better innovation, knowledge conversion and commercialisation processes. This thrust of strategy is the most difficult, yet ultimately has the best potential for improved company performance. It is effective commercialisation of ideas that has taken companies like Netscape and Formula One to multi-million dollar corporations in just a few years.

The Knowledge Dimension

One of the practical problems of developing knowledge strategies or adding a knowledge dimension to other strategies is the complex nature of knowledge. As we now know from many disappointing artificial intelligence initiatives of the 1970s, you cannot easily package knowledge into a black box and have it perform miracles. A potentially worrying trend about today's knowledge management movement is that IT managers, information professionals and software suppliers are jumping on the bandwagon and merely substituting the word 'knowledge' for 'information'. That is not to say that information is unimportant, since a good IT infrastructure, good information management (in the library sense) and effective information solutions, such as data mining, decision support tools, document management and groupware, are essential foundations. However, they do not go far enough.

The difficulty comes, not through handling 'explicit' knowledge, but 'tacit' knowledge which is harder to express and codify. Very often the most valuable knowledge that an organisation has is in the heads of its people, and those of its stakeholders, especially customers. However, "people walk", so forward looking companies continually to seek ways of locking it in to their organisation. The two complementary approaches are:

Converting it to a more explicit form - in documents, processes, databases etc. This is often referred to as "decanting the human capital into the structural capital of an organization". I call this the "Western tendency"

since it's the main emphasis of many European and US knowledge programmes.

Enhancing tacit knowledge flow through better human interaction, such that the knowledge is diffused around the organisation and not held in the heads of a few. In Japan various 'socialisation' activities support this kind of knowledge flow, that by its very nature also sparks the generation of new ideas and knowledge. Add some basic elements of good human resource management, including a stimulating environment, personal development plans, motivation and suitable reward and recognition systems (such as knowledge sharing awards and stock options), then there is less chance of your best knowledge workers wanting to leave.

6.12 SEVEN KNOWLEDGE LEVERS

Lever	Key Activities	Example
Customer Knowledge	Developing deep knowledge sharing relationships. Understanding the needs of your customers' customers. Articulating unmet needs. Identifying new opportunities.	Steelcase - an office products manufacturer has totally redefined its market into knowledge worker productivity through opening a customer knowledge channel from its product end-users into its R&D.
Stakeholder Relationships	Improving knowledge flows between suppliers, employees, shareholders, community etc. using this knowledge to inform key strategies.	Toshiba collects comparative data on suppliers ranking 200 quantitative and qualitative factors. It has an active suppliers network and association where knowledge is shared and suppliers are integrated into future strategies.
Business Environment Insights	Systematic environmental scanning, including political, economic, technology, social and environmental trends. Competitor analysis. Market intelligence systems.	Smith Kline Beecham have evolved a virtual library that delivers market updates, patent information and a wealth of externally sourced material to the desk tops of its research scientists.
Organizational Memory	Knowledge sharing. Best practice databases. Directories of expertise.	Price Waterhouse is typical of several consultancies who have knowledge databases to allow

	Online documents, procedures and discussion forums. Intranets.	sharing of company knowledge. In addition to the Knowledge View SM they have knowledge centres that provide human analysts and navigators. It helps them solve customer problems faster.
Knowledge in Processes	Embedding knowledge into business processes and management decision making.	CIGNA made their best underwriting knowledge available as guidance screens in their computerised underwriting processes. This helped them turn a loss into a profit.
Knowledge in Products and Services	Knowledge embedded in products. Surround products with knowledge e.g. in user guides, and enhanced knowledge-intensive services.	Campbell Soup's "Intelligent Quisine" (IQ) delivers weekly packages of nutritionally designed, portion controlled meals to those suffering hypertension or high cholesterol.
Knowledge in People	Knowledge sharing fairs. Innovation workshops. Expert and learning networks. Communities of knowledge practice.	Tetra Pak Converting Technologies has learning networks, where people from across the organisation, pool, update and develop their expertise in key technologies such as laminating and printing.

6.13 CREATING SUCCESSFUL KNOWLEDGE STRATEGIES

The table shows domains of the business where the knowledge dimension can be used as a strategic lever, either to add value to products and services or to improve organisational performance. For example, several surveys show customer knowledge heading the list of an organisation's most important knowledge i.e. knowledge of their needs, their relationship with you, and mutually beneficial opportunities. Note that such a lever goes far beyond the normal practice of customer satisfaction surveys.

However, as a strategist you will know that it is people and processes, rather than the content of a strategy, that will determine its ultimate success. Our analysis of organisations that exhibit best practice in knowledge innovation shows a number of recurring characteristics:

Clear and explicit links to business strategy. Is the knowledge strategy something separate or is it simply another layer or view of existing business strategy? How does knowledge or know-how add value to your business strategy? Conversely, what exploitable knowledge products, processes or expertise emanate from your business strategy?

Knowledgeable about knowledge - real understanding of the knowledge advantage. How much is knowledge discussed in your organisation? How well is it understood? Is the knowledge dimension a key element of every product plan, marketing plan, strategic initiative, annual budget, and personal development plan?

A compelling vision and architecture. Is the knowledge facet of your business framework that guides management decisions? Would an investor give you millions for your intangible ideas?

Knowledge leadership and champions. Are there enthusiastic proponents of the knowledge agenda throughout your business? Does your CEO visibly reiterate the importance of your organisational knowledge to your business success?

Systematic knowledge processes. Do you have systematic processes for capturing knowledge (both external and internal), organising it, and sharing it throughout your organisation? Do you have processes that enhance knowledge creation and innovation? Do you have policies and procedures to protect your knowledge assets?

A well-developed knowledge infrastructure (both 'hard' and 'soft'). Are people and information readily accessible through your computer and communications networks? Do these networks extend outside the organisation - to customers, suppliers, and world-class experts? Can you find what or who you want quickly and efficiently? Does your culture promote innovation and learning? Are your organisation structures flexible and adaptive? Are your personnel systems geared to recognising and rewarding individual and team knowledge contributions.

Appropriate bottom line measures. Do you measure the contribution of knowledge? Do you value your intangible assets? Do you balance financial performance indicators, with non-financial measures that underpin value creation? Do you measure knowledge flows? Do you use some of the new metrics, like those in Skandia's Navigator or Karl Erik Sveiby's Intangible Assets Monitor?

6.14 STRATEGIC CHALLENGES

The term “strategic challenges” refers to those pressures that exert a decisive influence on an organization's likelihood of future success. These challenges frequently are driven by an organization's future competitive position relative to other providers of similar products.

The five most common challenges in executing a strategic plan are:

1. Poor goal setting.

Strategic goals are often large and complex objectives that almost always require many resources scattered across many departments and locations to accomplish them. Establishing clear goals across teams will result in more clarity on priorities and responsibilities.

Recommendation: Ensure that your entire organization has adopted a goal-setting methodology. The objectives and key results (aka “OKRs") method is emerging as the new standard, but using SMART (goals— specific, measurable, attainable, relevant and timely) is better than nothing. Ensure that there are established best practices for writing goals. Each manager should be responsible for his or her team’s goals. If no best practices are being followed, use OKRs.

2. Lack of alignment.

Even with proper goal-setting, teams and people can be challenged with a lack of alignment that typically causes prioritization issues and collaboration conflict that can derail the day-to-day work to achieve the strategic goal. The biggest cause of strategic misalignment is the nonstrategic work that people are so used to doing. Often nonstrategic objectives become the priority, as they are routine and often the most easily attained.

Recommendation: By establishing clear alignment on who is working on which strategic objective, as well as what each of those objectives are will empower those people to drive the priority over nonstrategic objectives. This is especially true if you can see the alignment straight through the hierarchical structure.

3. Inability to track progress.

Many organizations are still using spreadsheets to track objectives. This can work between a manager and employee, however, these systems do not make it easy to aggregate results or create transparency. Worse, their use limits the ability to real-time manage the attainment of strategic goals.

Recommendation: Consider using strategy execution platforms such as Tanics, Achieve It or Rhythm Systems to change the way this game is played. Managers and employees, especially millennials, expect clear direction in real time on why and what is important. By improving alignment, transparency, collaboration and manageability an organization can immediately realize higher efficiency as well as more results. Knowing the score lets an organization and every person connected with that strategic goal adjust their game to maximize the outcome.

4. People not connected to the strategy.

People in general like order and routine, so we are more likely to fall into an operational tactical focus where our efforts can result in immediate

results. Unfortunately, strategic goals are rarely this easy and small in scope, so how do we get people working differently? The best way is to connect people more closely to strategy by aligning professional goals with personal interests. For example, learning new skills, having more responsibility, working with different people and teams, working outside their department on what we refer to as "strategy teams."

Recommendation: Let people create their own strategic goals initially to capture their ambition and preference. Managers then work at trying to align that employees' goal with the larger strategic plan. Shift the focus from "an employee working inside a department" to "an employee working towards a company's strategic goal as part of a strategic team."

5. No measurements or leading indicators.

The old proverb, "You manage what you measure," is paramount to strategy execution. Without measurement, how do you manage the people and issues that can derail a strategic goal? You must set measurable goals, track them and manage them Having leading indicators like predictive analytics stimulates the management discussions at all levels.

Changing how your organization executes strategy may seem like a complicated and challenging change management project, but it can be done relatively quickly and incrementally with immediate results. Start at the top. Executives have the most to gain and can certainly lead by example. Implement these best practices to start the transformation.

Make the strategic goals clear. Use a methodology like OKRs to give the goals more structure.

Set executive goals and demonstrate the leadership team's focus on strategy.

Make all strategic goals transparent to everyone. Show how each executive's goals weave together.

Use technology, as transparency and real-time tracking cannot be accomplished otherwise.

6.15 E-BUSINESS APPLICATIONS FOR BUSINESS COMPETITIVE ADVANTAGES

Studying the evolution of business organizations has received much of attention in organization theory and MIS research Because organizations are not internally self-sufficient, they require resources from the environment, and thus become inter dependent with those elements of the environment with which they transact. Organizational and ecological theorists argued that organizations develop internal and external strategies which seek to minimize the uncertainty arising from dependence on the environment for resources.

As information technologies developed, novel ways of business process redesign emerged. Most organizations today use Internet technology to redesign their processes in ways that provide new competitive advantage. Through the infrastructure of existingB2B exchanges in the e-marketplaces, many organizations will eventually be able to integrate activities of their value chain encompassing suppliers, customers, and distribution channels within an industry or across industries. The potential of e-business is so great that many believe that e-business is the new economy that decides the success of future business organizations.

Major success factors for e-business include:

3. Internet technology fully integrated into the company's overall strategy.
4. Competitive advantage maintained in both operational efficiency and distinctive strategic positioning.
5. Basis of competition not shifted from traditional competitive advantage, such as cost, profit, quality, service, and features.
6. Company's strategic positioning well maintained.
7. Support from top management.
8. Buyer behavior and customer personalization.
9. Quick time to market.
10. Right systems infrastructure.
11. Good cost control.
12. Good e-business education and training to employees, management and customers.
13. Customers and partners expectations well-managed.
14. Good products and services offered by e-business.
15. Current e-business systems expanded to cover entire supply chain.
16. New competitors and market shares tracked.
17. Website of high quality that meets or exceed user expectations.
18. Company's virtual marketplace established.

6.16 POINTS TO REMEMBER

- A virtual business is one that moves a significant portion of its business online.

- Virtual businesses usually don't have any physical storefront that customers can visit, and they may also allow employees to work digitally from home.

- Retail and IT sectors are two industries that have embraced the shift to virtual business.

- BPR includes three phases; analysis phase, design phase, and implementation phase. It is also referred to as business process redesign, business process change management, and business transformation.

- E-commerce known as electronic commerce is the process of buying and selling of goods and services. It refers to the online purchase of goods with the use of the internet in around all over the globe. To execute the sale of electronic products or services you need to fill all the data online.

6.17 QUESTIONS

1. Explain Business Process Re-engineering Steps?
2. Explain how Business Process Re-engineering works?
3. Explain concept of Virtual Business?
4. What are various Pros and Cons of virtual Business?
5 Explain E-Business Applications for business competitive advantages

6.18 REFERENCES

- Strategic Management and Business Policy: Globalization, Innovation and Sustainability | Fifteenth Edition | By Pearson
- Strategic management author: **pearce**
- Management Information Systems: Managing the Digital Firm by Kenneth Laudon (Author), Jane Laudon (Author)
- https://www.wiley.com
- https://www.academia.edu/9464635/Strategic_Roles_of_information_Systems_Introduction

7

MANAGING INFORMATION SYSTEMS

Unit Structure

7.0 OBJECTIVES

- To understand the concept of MIS
- Understand concept of working of MIS
- IS Methodologies
- Critical Success factors effecting Business Systems
- Concept of computer Aided Planning

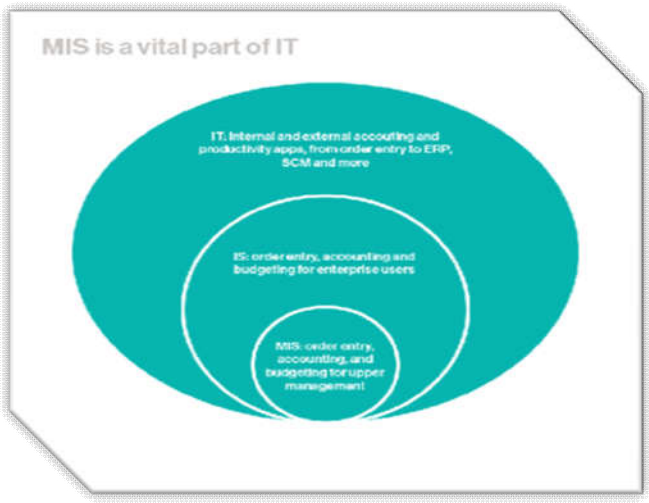
7.1 INTRODUCTION TO INFORMATION SYSTEMS

A management information system (MIS) is a set of systems and procedures that gather data from a range of sources, compile it and present it in a readable format. Managers use an MIS to create reports that provide them with a comprehensive overview of all the information they need to make decisions ranging from daily minutiae to top-level strategy. Today's management information systems rely largely on technology to compile and present data, but the concept is older than modern computing technologies.

MIS is an organized integration of hardware and software technologies, data, processes, and human elements. It is a software system that focuses on the management of information technology to provide efficient and effective strategic decision making. MIS is the acronym for **Management Information Systems.** MIS is a set of procedures which, when executed, provides information to support decision making.

MIS (management information systems) is the department controlling hardware and software systems used for business-critical decision-making within an enterprise.

The MIS department was originally the whole of information technology. From the 1960s to the early 1980s, practitioners and business schools referred to MIS, rather than IT. In the early days, enterprise computing's main role was to help the CEO and CFO with information systems management for a few key run-the-business tasks, such as order entry, accounting and budgeting. No enterprise applications existed; programmers painstakingly wrote code to carry out these functions, usually on a mainframe.



These systems were business-critical, meaning a business would fail if it had to go back to manual accounting. If MIS failed, the business was in danger. The CFO oversaw MIS, ensuring the developers and administrators delivered what accounting needed.

In the 1980s, with the advent of personal computers that ran spreadsheets, the scope of computing's responsibilities began to change. Personal spreadsheets took business-critical processes out of the domain of upper management; MIS needed to service a wider range of users -- deploying external, as well as internal, software programs. The name of the department changed to reflect this new set of internal customers, becoming information systems (IS). The MIS department became one, still-vital part of the overall IS department.

7.1.1 How a MIS works

In addition to serving as a department within a company, MIS refers to computer software that is used to store, organize and analyze information. Management information systems are used to track sales, inventory, equipment and related business information. In the past, management information systems ran on mainframe computers. As computing systems evolved, MIS moved to run on client/server systems. Today, it's common for MIS to run in the cloud or in a hybrid cloud.

7.1.2 Types of MIS

The four types of MIS are:

- **Transaction Processing System (TPS)**, which processes the routine transactions associated with a business. Example transactions include payroll processing, order processing, such as for an e-commerce business, and invoicing.

- **Management Support Systems (MSS),** which store and organize data, enabling end users to generate reports and analyze data to address business needs and inform planning. A data warehouse is an example of a Management Support System.

- **Decision Support Systems (DSS)**, which analyze business data to assist managers with decision making. For example, a DSS could project revenue figures based on new product sales assumptions.

- **Expert Systems**, which provide managers with insights and advice, using artificial intelligence (AI) to simulate the expert knowledge of a human in a particular field.

7.1.3 MIS vs. IT management

In the 1990s, the rise of the enterprise application brought about a new set of IS tasks. Companies succeeded by providing better services to the consumer than competitors, via a proper mix of enterprise applications and homegrown ones. The applications handled a wider range of functions than the original MIS department: order entry, accounting and budgeting, but also enterprise resource planning, supply chain management and sales force automation. Many of these tasks were not solely the property of the IS department -- outside vendors, outsourcers and line-of-business computing departments all claimed a share of enterprise computing.

Information systems became more of a strategic director of the software and underlying hardware technologies in the enterprise's architecture, and less of a controlling central entity. Again, the name changed to reflect the new role: information technology, or IT, rather than IS. Again, the original MIS department became a smaller part of the overall whole.

Today, the term *management information systems* is used broadly in various contexts. These include, but are not limited to:

- Decision support systems
- Resource and people management applications
- Project management
- Database retrieval applications.

Although the boundaries between MIS and IT management have become fuzzy over the years, typically, MIS still covers systems that are critical to the company's ability to survive, including accounting and order entry. Upper management should understand the importance of MIS in the context of enterprise revenue.

In many businesses, MIS handles legacy software and hardware, coded by programmers long since retired, who left no documentation for the systems. This is equally a role of IT management and business coordination. The enterprise upgrades or modernizes these systems only very carefully, and with high appreciation of the risks involved. Therefore, the importance of MIS, and the people who support it and know its quirks, remains high -- even if it is a little-discussed part of enterprise IT.

7.1.4 Importance of MIS

MIS, both the department and the software system, can help companies gain a competitive advantage. The data managed by an MIS system can help managers make better decisions related to sales, manufacturing, resource allocation and more. Both the MIS department and the software systems help organizations increase productivity by enabling workers to spend more time on productive tasks.

The MIS department plays an important role in providing these support services within an organization:

- **Governance**, which involves systems and controls over employees' use of computing systems. This MIS department defines, manager and enforces rules on how (and whether) employees can access the company's technologies and network infrastructure. MIS is responsible for IT security, as well as enforcing codes of conduct related to computer systems use.

- **Infrastructure**, which refers to the technology systems that support the day-to-day functioning of the business, such as phones, desktop/laptop computers, servers, application software and cloud computing. The MIS department provides internal help desk and support services, assisting employees and troubleshooting issues related to the infrastructure.

- **Data management**, which involves the provisioning and management of systems that enable employees to access and update critical business data. The MIS department is responsible for ensuring the availability and security of the data management systems.

7.2 WHAT IS ENTERPRISE MANAGEMENT?

Enterprise management is a term used for modern examples of ERP that allow businesses to manage vital day-to-day processes such as inventory management, accounting, human resources and customer relationship management (CRM). An Enterprise Management System (EMS) is a comprehensive software package that caters to the many needs of larger organizations. The term is sometimes used interchangeably with Enterprise Resource Planning (ERP) but the latter is more a type of EMS, rather than a synonym.

EMS solutions typically support the core business processes, the flow of information, a variety of reports, and data analytics.

Because of the high implementation costs of the system and the fact that small and medium-sized companies are less complex, Enterprise Management Systems were usually not suitable for smaller businesses.

Enterprise management supports how different business units work by sharing information through a shared database.

Primary types of enterprise management systems

There are three primary types of enterprise management systems:

- **Customer Relationship Management (CRM)** is software that manages a company's interactions with existing and potential customers. The ultimate goals of CRM are to keep businesses connected to customers, streamline their processes, and improve their profitability.

- **Enterprise Resource Planning (ERP)** facilitates processes across multiple business functions. It allows organizations to eliminate discrepancies and duplications while sharing and accessing data in real-time.

- **Supply Chain Management (SCM)** is software that manages the flow of goods, data, and finances related to a product. It begins with the purchase of raw materials and continues to the final delivery of the product.

7.2.1 Benefits of an Enterprise Management System:

- **Easier business planning**

Enterprise systems make it possible to create business plans with ease and track how well your company is doing in pursuing its goals.

You can check your production, keep an eye on expenses, or look at customer satisfaction statistics. It's usually just a matter of viewing a dashboard that compiles the information into charts and tables.

Most systems can alert you to potential issues, such as a sudden increase in defects or low inventory.

- **Better productivity and flexibility**

One of the primary benefits of EMS is that it automates specific processes, which makes your employees more productive. For instance, they can do payroll, send out sales emails, and replenish inventory automatically.

Another significant advantage is that the system organizes information in one place for instant access regardless of the location. Every employee can retrieve the data needed to do the job even if they work from home or do fieldwork.

- **Improved record-keeping and compliance**

Using EMS also assists with record-keeping and compliance. Because of its integrated security system, the risk of loss or theft of data is mitigated, and the information that's stored there is always available if you need proof of your business's performance for any regulatory body.

7.2.2 EMS vs. ERP systems

Although some people continue to use the terms Enterprise Management Systems and Enterprise Resource Planning interchangeably, there are some differences between the two.

Mainly, an EMS can include ERP as part of the package, but the ERP itself is a standalone application with individual modules that address various business functions.

EMS covers all the critical business functions in one package, transferring information from one section to another quickly and accurately.

An ERP system will check inventory and help with back-office features, as well as assist in planning, production, and management.

The EMS will go beyond that to monitor competitors, suggest new market areas and ways of attracting new customers, and keep an eye on the external relationships of the organization.

The basics of an ERP solution

As mentioned earlier, enterprise resource planning (ERP) is typically one application with a set of modules. The software focuses on three core resources:

- Human resources
- Inventory, facilities, and asset management
- Financial, including payroll, accounts payable and receivable, and general ledger

ERP software is designed to optimize the internal processes within a company. It provides employees with accurate real-time data and reports, and it assists managers by contributing timely information to aid them in their decision-making process.

ERP software begins its work when an order arrives. The system immediately checks the inventory for available materials. It then plans production and manages those materials. The system monitors all processes until the products are shipped and delivered.

EMS is more data-focused

Enterprise management systems are large-scale software packages that track and control the complex operations of a business. They are used as a central command center, automating the organization and making it convenient to prepare reports and make decisions.

Here's what an effective Enterprise Management System does:

- Stores business data in a usable format that can be retrieved quickly
- Automates the customer service process
- Secures customer data
- Reduces the cost of doing business
- Standardizes critical processes

- Streamlines supply chain management
- Ensures regulatory compliance
- Allows scalability of IT capabilities
- Gives real-time access to data

So it would make sense to take advantage of an EMS any way you can if you want to gain a competitive edge over your rivals. Not only does it make the workflow so much more effective, it will also allow you to scale your business in the smoothest way possible.

7.3 INFORMATION RESOURCES MANAGEMENT (IRM)

Information Resources Management (IRM) is the process of managing information resources to accomplish agency missions and to improve agency performance, including the reduction of information collection burdens on the public. When standardized and controlled, these resources can be shared and reused throughout an agency, not just by a single user or application.

Definition: Information Resource Management (IRM) is a technique of managing information as a shared organizational resource.

Information Resources Classes

There are three (3) classes of information resources:

1. Business Resources: Enterprises, Business Functions, Positions (Jobs), Human/Machine Resources, Skills, Business Objectives, Projects, and Information Requirements**.**
2. System Resources: Systems, Sub-Systems (business processes), Administrative Procedures (manual procedures and office automation-related), Computer Procedures, Programs, Operational Steps, Modules, and Subroutines.
3. Data Resources: Data Elements, Storage Records, Files (computer and manual), Views, Objects, Inputs, Outputs, Panels, Maps, Call Parameters, and Data Bases

7.3.1 Information Resources Management (IRM) Concept

The concept of RM is actually no different in intent than Materials Resource Planning (MRP) as used in manufacturing. Both are concerned with the efficient and cost-effective use of resources. The classification and control of resources are the main objectives. Resources are classified to prove their uniqueness so that redundancy is not introduced and to promote sharing. Control is required to collect, inventory, and retrieve resources as required by the business.

7.3.2 Benefits of Information Resources Management (IRM)

One of the important benefits of IRM is the cataloging and cross-referencing information resources is a model of the enterprise, including how it is organized and how it operates. Other benefits include:

- All information resources are controllable, permitting the ability to design integrated systems and perform an "impact analysis" of a proposed resource change.
- The simplified search of information resources for reuse. The redundancy of resource definition is eliminated.
- Complete and current documentation of all information resources, in an organized and meaningful way.
- Communications within the organization are improved since developers and users would use standard and common definitions for information resources, all of which would be in standard and common definitions for information resources, all of which would be in standard business terminology.

7.4 WHAT DO YOU MEAN BY MANAGEMENT TECHNOLOGY?

Management of Technology (MOT) as a field links "**engineering, science, and management disciplines to plan, develop, implement technological capabilities to shape and accomplish the strategic and operational objectives of an organisation** Technology management or management of technology (MOT) can be viewed from many different perspectives since the word technology itself is subject to various interpretations. However, the author of this editorial approaches the topics from different experiences that are associated with different environments and backgrounds. It is hoped that this editorial will present the many facets of technology management. The two words of management and technology not only carry the burden of many different meanings, but also present additional sophistication due the anthropological diversity. To many, MOT means managing engineering and technology. To others, MOT indicates managing knowledge and information, managing research and development, managing manufacture and operation, managing the activities of engineers and scientists or managing the functional activities without concern for the total of activities that encompass the business concepts to commercialization process. According to Gaynor (1996), these interrelated activities must be integrated into a technology system. MOT means not only managing the system, but also managing the pieces, which involves integrating the "pieces" into an acceptable "whole" by focusing attention on the interdependence of the pieces. However, these elaborations are only part of the process of MOT by this editorial.

According to the 1987 workshop report of National Research Council (NRC) of USA, "Management of Technology" is the hidden competitive

advantage bridging "the knowledge and practice gap" between science, engineering and business management (Khalil, 2001). Management of Technology (MOT) as a field links "engineering, science, and management disciplines to plan, develop, implement technological capabilities to shape and accomplish the strategic and operational objectives of an organisation." The NRC report summarises important contributions to industry that management of technology knowledge can make as follows:

- How to integrate technology into the overall strategic objectives of organization
- How to get into and out of technologies faster and more efficiently
- How to assess/evaluate technology more efficiently
- How best to accomplish technology transfer
- How to reduce new product development time and costs
- How to manage large, complex and interdisciplinary or inter-organisational projects/systems
- How to manage the organisation's internal use of technology
- How to leverage to effectiveness of technical professionals.

To put it in a simple way, technology management is about getting people and technologies working together to do what people are expecting, which is a collection of systematic methods for managing the process of applying knowledge to extend the human activities and produce defined products. Effective technology management synthesizes the best ideas from all sides: academic, practitioner, generalist or technologist.

7.4.1 Significance of technology management

It is argued that there are three major factors strategically in modern organisations that underpin the creation of competitive advantages. The first of these is strategic leadership. The effective leadership ensures that the enterprise will develop itself in the right direction and the production of product will meet the demand of the market. The second factor is having a staff with motivation and empowerment. They are the driving forces of the organisation. The third factor is the proper management of technology. It is important that the company's technology be appropriately and properly managed so as to achieve effective and competitive status (Harrison and Samson, 2003).

Leadership and motivation of employees have been widely recognised as success factors. There have been significant additions to theories and practice regarding improvement in the management of people. Therefore, strategically, the remaining battle-field being competitive depends on proper management of technology. To put it differently, the strategic issue will be how a company could develop, acquire, share and manage technology appropriately and effectively.

It is interesting that this argument has been in congruence with the American historical experience. The USA experienced an increasing global competition which resulted in loss of market share in several

industry sectors in the 1970s and 1980s. This became a concern not only to industries, but also to government and educational interests. To identify reasons of the decline in US industrial competitiveness and to formulate a response to the challenges within global competition, serious work and efforts had been contributed in the search for explanations and solutions. Discussions were initiated by major establishments such as The National Research Council (NRC), the National Science Foundation (NSF), the American Association of Engineering Societies, the Accreditation Board for Engineering and Technology, the American Assembly of Collegiate Schools of Business, Oak Ridge associated Universities and others. A series of workshops were organised and attended by experts for the discussion of changing paradigms in business and technology. A resulting consensus was that great attention and significant amount of efforts should be directed towards making improvement in the Management of Technology and in conducting research and developing educational programs in this emerging field of knowledge.

Khalil (2001) highlights that efforts to improve the US position in the global economy were being influenced by the understanding that more organisations, including government agencies, high educational institutions, enterprises and founding agencies, become aware of issues involved in the international arena. Today, rapid changes in the technology and business environment continue to occur. These changes require continuous updating of methods and techniques of business practice. For example, measuring the value of a business according to assessment of physical assets or based on traditional accounting or finance formulas are inadequate in the knowledge economy. Education and training institutions need to take into consideration the changing environment in technology and business and respond by changing their programs accordingly. Khalil (2001) argues that international business and engineering schools need to have consideration of incorporating into their curricula educational modules recognizing the importance of the knowledge era and the technology revolution. The intangible assets such as intellectual capital, intellectual properties, service innovation, information technology and many of today's rapidly growing arenas should be recognized. Furthermore, many of the existing models and the traditional programmes need to take into account the appropriateness and effectiveness of technology and innovation as well as the volatilities of the environment in which the technology is created and applied.

In addition, in the twenty-first century, technology assumes a great importance in advancing every aspect of human endeavours. MOT assumes even greater importance in the capacity building of countries, companies and individual to embrace technological changes in order to advance their competitive status in a global marketplace. It has been recognized that the interest in the field of management of technology has mushroomed since the inception of the movement to introduce MOT as a new field of study and research in the 1980s. The application of MOT principles has made a significant impact on the wealth creation ability of the USA and a large number of other countries.

New endeavours in management of technology

It has to be acknowledged that there are a number of endeavours to embrace the challenges that the world is facing in terms of management of technology. The International Association for Management of Technology (IAMOT), founded in the early eighties, has become the leading and largest international professional association solely devoted to the promotion of management of technology education, research and application. IAMOT is currently undertaking a major initiative to create guidelines for academic programs in MOT and certification/accreditation guidelines to recognize the quality of academic programs. This promises to be a strong step towards establishing formal management of technology education globally on a sound academic basis.

In addressing the Chinese experience in terms of management of technology, Li-Hua and Khalil (2006) argues that appropriate infrastructures, strategies and mechanism for management of technology needs to be established in order to support the diffusion of management of technology principles throughout China. The conceptual framework for the future direction and needs has been proposed based on the USA research and education experiences over the past two decades. It is debatable whether business and engineering schools need to introduce MOT curricula following the USA model or develop a new model shaped by the Chinese culture. It draws upon the experience of the USA in Management of Technology over the past two decades and projects what may be needed for China to continue its development and economic growth in the future.

It is however evident that current situation in China in terms of MOT presents both opportunities and challenges not only to Chinese business, but also to the Western business. Today, increased levels of competition discussed in this editorial in the wake of China's entry into the WTO have resulted in experimentation and risk-taking as ways of doing business in China. However, the uncertainties and ambiguities prevalent in the Chinese business environment, in particular, in the area of technology management, are neither well understood nor effectively negotiated by the international investment community. In addition, the complexities of technology and knowledge transfer have led to misunderstanding in the operation and the implementation of international joint venture projects in China. Therefore, as to the international investors, China's business environment continues to present many challenges, particularly in how to manage effective business networks and ensure smooth knowledge transfer, especially in international joint venture projects.

7.4.2 Management IS planning Methodologies

Strategic planning is an integral part of any business' success, and it will ensure your business is heading in the right direction. Furthermore, it helps outline your objectives as it's crucial to helping business owners make their everyday decisions.

With the best strategic planning methodology in place, your business will be proactive as opposed to being reactive. You will seamlessly increase your operational efficiency with proper strategic planning and projects. Your profitability and market share will increase significantly. Your business will be more relevant in its respective industry since you will serve your customer base better. However, as important as strategic planning is, many businesses have yet to emulate this opportunity. Also, a single strategic model isn't better than other models.

7.4.3 What Is A Strategic Planning Model?

It refers to how a business creates a plan and implements it to make its operations better and further meet its business goals. Your business can benefit a great deal by having a well-defined strategic planning model in place.

For instance, a good strategic planning model will ensure all departments of a business work harmoniously. Moreover, it allows businesses to achieve their targets in the long-run.

Every business leader should know the basics of strategic planning to enable them to come up with an appropriate strategic planning model. Such basics include developing your business' strategic goals, as well as their potential impacts. You have to define your goals while creating your plan. Factor in defining your key goals, long-term goals, operational goals, and company goals. The basics further include crafting strategies for the development of your strategic planning model.

Some suitable strategic methodologies you should emulate in your strategic planning process:

Basic Planning Methodology

The strategic planning methodology is also referred to as the simple strategic planning model. Businesses that utilize this structure include startups or businesses that have little knowledge in strategic planning. Moreover, the model is ideal for smaller companies that lack resources to execute complex strategic planning methodologies.

It also focuses on developing your business' mission, vision statement and core values. Business leaders can use the model to outline the steps they should take to achieve their business goals. Basic strategic planning methodology can further enable business leaders to monitor the progress of their businesses.

The main advantage of using this strategic planning model is that it helps you create a solid mission statement that perfectly describes why your business exists. Furthermore, you can use it as a resource to select your company's intermediate goals in regard to what you should accomplish first.

The basic strategic planning methodology helps you create actionable plans that outline the elaborate steps your business should take to

implement certain strategies. You can effectively monitor your progress while using this model.

Goal-based Strategic Planning Methodology

Businesses that start with using basic strategic planning methodology shift to goal-based strategic planning methodology over time. The model is suitable for established organizations or businesses seeking for more complex strategic planning methodologies. It is the most frequently used strategic planning model.

It starts with an analysis of a business' weaknesses, threats and opportunities. Goal-based strategic planning methodology also focuses on your business' internal and external factors and threats and competition. Next, you can use the strategic planning model to identify issues and goals which you can use to prioritize your business objectives.

Alignment Strategic Planning Methodology

The methodology helps you craft a strong relation between your business' mission and resources. The model can be a perfect tool for your business, especially if you are striving to fine tune your objectives and identify why you aren't achieving your goals.

This model helps you outline your business' resources. It further helps business owners establish the specific aspects of their businesses that are working appropriately, and which aspects need some adjustments. Finally, you can include these adjustments in your business plan. This step is the most important step in making an effective business plan.

Organic Strategic Planning Methodology

The strategic planning methodology doesn't use linear methodological approaches, unlike other strategic planning models. Organic strategic planning methodology uses an approach that strategic planning experts call story boarding. This approach allows business owners to develop unique business ideas. It can prompt you to be active on matters that affect your business.

The planning models start with clarifying your business' cultural values through dialogues and storyboarding techniques. Next, the strategic planning methodology focuses on articulating a business' vision. The accomplishments of this methodology translate into a business' goals.

Scenario Strategic Planning Methodology

This is another common strategic planning methodology to consider. It is more of a strategic planning technique rather than a strategic planning methodology. The methodology is highly effective in identifying issues, goals and external environments. It is useful for businesses that are preparing for a variety of scenarios that are the result of external forces of changes in the business environment.

The strategic planning model starts with establishing vulnerabilities that could possibly affect a business. After identifying possible vulnerabilities , you can look into strategies you can use for responding to the prevailing vulnerabilities.

2. Balanced Scorecard

The strategic planning methodology entails considering your business' objectives, initiatives and measures. You can develop this model by using programs such as Google Sheets, PowerPoint and Excel. The strategic planning methodology gives you comprehensive details into your business' initiatives and measures.

3. Strategy Mapping

The strategic planning methodology is a tool that is used for communicating a strategic plan. The tool is suitable for achieving high-level business goals. It helps communicate-high-level details across your business in an easy-to-understand model. The strategic planning model offers an array of benefits including:

- A simple and straightforward visual representation that is easy for organization and businesses to refer to during the development process
- It helps unify all company goals into one business strategy and comprehensive plan
- It can help you determine your key basic steps and goals
- It helps you establish how your business objectives affect others in real time

7.4.4 Critical Success factors Business Systems Planning

Information system planning has been one of the critical issues in an organization. Besides assisting the organization to achieve its objective, information system planning has been used by organization to identify its higher payback towards implementing it. In achieving this, organizations should clearly understand the factors that critically importance in the system development for their organizations

CRITICAL SUCCESS FACTORS

A. Skills

The success of an organization depends on many factors and one of it is the human factors. In order to make sure that the organization can increased their competitiveness in regards to competitive environment, skills worker or employee is needed. Papalexandris & Nikandrou (2000) in their study found out that there are four main categories of skills that is demand by the organizations which are technical skills, human skills and conceptual skills and one of the skills included in the technical area is project planning. Further, Teo (2003) concluded that a managerial IT skill is important to provide a sustainable advantage of the IT. Therefore, the authors suggest that the higher the human resource

skills, the more likely the information system planning will be success.

B. Cooperation from other departments
For some organization, the information sys

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What Are Critical Success Factors?

Essentially, critical success factors or CSFs are the elements of an organization or project that are vital to its success.

The concept of CSFs (also known as Key Results Areas or KRAs) was first developed by management consultant D. Ronald Daniel, in his article, "Management Information Crisis." [1]

John F. Rockart, of MIT's Sloan School of Management, built on and popularized the concept almost two decades later. He defined CSFs as: "The limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization. They are the few key areas where things must go right for the business to flourish. If results in these areas are not adequate, the organization's efforts for the period will be less than desired."

Rockart also concluded that CSFs are "areas of activity that should receive constant and careful attention from management." [2]

7.4.5 The Four Main Types of Critical Success Factors

four main types of CSFs that businesses need to consider:

- **Industry factors** result from the specific characteristics of your industry. These are the things that you must do to remain competitive within your market. For example, a tech start-up might identify innovation as a CSF.

- **Environmental factors** result from macro-environmental influences on your organization. For example, the business climate, the economy, your competitors, and technological advancements. A PEST Analysis can help you to understand your environmental factors better.

- **Strategic factors** result from your organization's specific competitive strategy. They might include the way your organization chooses to position and market itself. For example, whether it's a high-volume, low-cost producer; or a low-volume, high-cost one.

- **Temporal factors** result from your organization's internal changes and development, and are usually short-lived. Specific barriers, challenges and influences will determine these CSFs. For example, a rapidly expanding business might have a CSF of increasing its international sales.

Critical success factors are derived from your organization's mission and objectives. They set out what you need to do to be successful and tend to be universal across organizations. For example, they might include things like:

- Increasing profits.
- Improving employee engagement.
- Improving talent acquisition and retention.
- Becoming more environmentally-friendly.

Once you've identified your CSFs, you can use them to develop more specific Key Performance Indicators (KPIs). These are the specific criteria that managers and organizations use to measure performance, and they often differ from organization to organization.

KPIs provide the data that enable a business to decide whether CSFs have been met, and if goals have been achieved. KPIs can also be used at different levels of a business – they can be used to clarify strategic, business-wide targets, or even to drill down into team and personal objectives.

7.4.6 Five Steps to Identify and Develop Your CSFs

To identify and develop CSFs for your organization, follow these five steps:

1. Research Your Mission, Values and Strategy

First, take some time to look through your organization's **mission** , values and strategy. What are the challenges and key priorities that your organization needs to be focusing on right now?

If you're unsure, or want to gain some background, do a **PEST Analysis** to gain a better understanding of the external market factors that are influencing your organization right now. Follow this up with a **SWOT Analysis** to identify how well-equipped you are at dealing with these

market challenges, and to assess your organization's strengths and weaknesses. This all-round approach should help you to clarify what improvements need to be made and where.

2. Identify Your Strategic Objectives and Candidate CSFs

Identify your organization's key strategic goals – these are usually linked to your mission and **values** . Then, for each objective, ask yourself, "How will we get there?" There may be a number of things that need to happen for you to achieve each of your strategic objectives. These are your "candidate" CSFs.

For example, if one of your strategic goals is to "reduce waste over the next year," you will likely need a number of critical success factors to help you to achieve this, such as:

- Reducing carbon emissions.
- Investing more in renewable energy sources.
- Improving the efficiency of supply chains.
- Developing "green" offices and processes.

3. Evaluate and Prioritize Your CSFs

Now, work through your candidate CSF's and identify only those that are truly essential to your success.

As you work through each candidate CSF, you may see that some are linked or are interdependent. For example, if have two CSFs – "to increase your share of the market" and "to attract new customers," the latter would take priority, as it is only by attracting new customers that you will likely increase your market share.

Prioritizing your candidate CSFs in this way will enable you to really focus in on the areas that your business must succeed in. You may find that some candidate CSFs are not a priority at all, in which you case you can cross them off your list.

4. Communicate Your CSFs to Key Stakeholders

Once you've identified your key CSFs, you now need to think about who is best placed to help you to achieve them. What departments or people will need to be accountable for them? What activities or operations will be key in helping you to achieve your CSFs? Do any activities or roles need to be changed or developed to do this?

Once you've done this, communicate your key CSFs to the relevant people. Make sure that everyone is clear on what they are, why you need to achieve them and how you hope to succeed. Get **feedback** from these key stakeholders, too – they are often best placed to identify any roadblocks or issues that may need to be overcome to achieve success. They may also be able to offer some great ideas of their own about how to meet your CSFs.

5. Monitor and Measure Your Progress

Think about how you will monitor and measure each of your CSFs. This can be tricky as CSFs are often very broad and may require input from several different departments and stakeholders across the business.

One way to effectively monitor and measure your progress is by setting a number of different KPIs against each of your Critical Success Factors. For example, if one of your CSFs is to reduce your carbon emissions, you might create a KPI to fill in some detail, such as "Reduce carbon emissions by 30 percent by 2035."

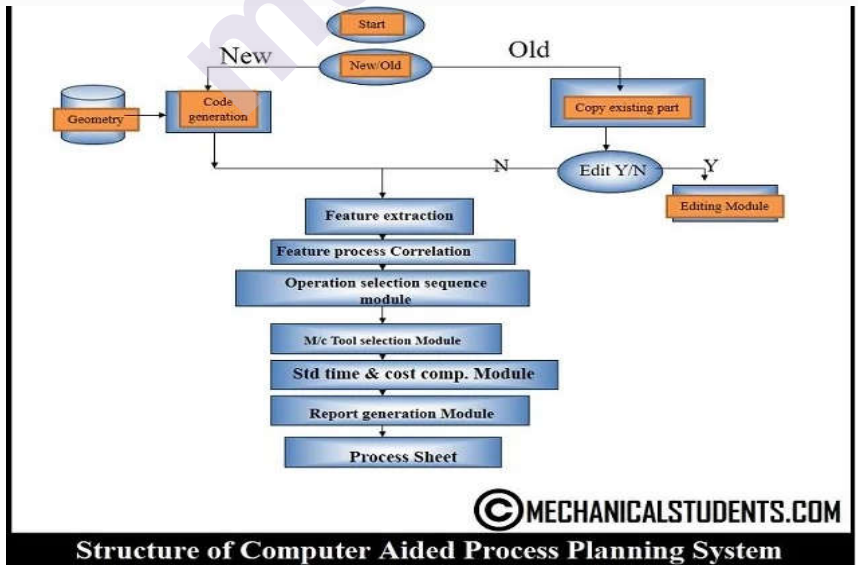
It's also a good idea to put in place monitoring systems to keep track of your progress. This might mean assigning accountability for this task to a specific person or department. This person will be responsible for gathering data and regularly monitoring the organization's progress toward specific CSFs and KPIs.

So, you would need to think about how this person would gather data on your organization's carbon emissions going forward, where they should store that data, and how regularly they would need to update it.

7.5 COMPUTER AIDED PLANNING TOOLS.

Process planning can be defined as an act of preparing, processing documentation for the manufacturing of a piece, part of an assembly is called Process Planning.

It can be defined as an act of preparing processing documentation for the manufacturing of a piece, part or an assembly, etc. is called as process planning. If process planning was done by using a computer it is called Computer-Aided Process Planning (CAPP).



Structure of Computer Aided Process Planning System

7.5.1 Why Computer Aided Process Planning(CAPP)?

- Understand the interactions between the part, manufacturing, quality, and cost.
- Systematically produce accurate and consistent process plans.
- Reduce the cost and lead time of process planning.
- Skill requirements of process planners are reduced.
- Increased productivity of process planner.
- Easily interface with other application programs for further analysis.

Parts of Computer-Aided Process

1. **Generative Computer Aided Process Planning (G CAPP)**.
2. **Variant Computer Aided Process Planning (Variant CAPP)**.
3. **Retrieval Computer Aided Process Planning (Retrieval CAPP)**.

Topics of Today

Process planning can be defined as an act of preparing, processing documentation for the manufacturing of a piece, part of an assembly is called Process Planning. In this article, I will be explaining about **Process planning, Computer-Aided Process Planning (CAPP), Generative CAPP, Variant CAPP, Retrieval CAPP,** and all its features in a detailed manner.

In order to know about Computer Aided Process Planning, you must know about **Process Planning** First which was mentioned below.

7.5.2 Steps of Process Planning in Manufacturing:

- Analysis of part requirements
- Selection of raw workpiece
- Determining manufacturing operations and their sequences
- Selection of machine tools
- Selection of tools, work holding devices, and inspection equipment
- Determining machine conditions (cutting speed, feed, and depth of cut)
- Manufacturing times (setup time, lead time, and processing time).

Two important areas in the life cycle of a product are design and manufacturing. Process planning serves as an integral link between design and manufacturing. i.e.

- Process Planning in Design
- Process Planning in Manufacturing

Process planning consists of preparing a set of instructions that describe how to fabricate a part or build an assembly which will satisfy engineering design specifications.

The resulting set of instructions may include any or all of the following:

- Operation sequence
- Machines
- Tools
- Materials
- Tolerances
- Cutting parameters
- Processes (such as how to heat-treat)
- Jigs
- Fixtures
- Time standards
- Setup details
- Inspection criteria
- Gauges
- Graphical representations of the part in various stages of completion.

7.5.3 Process Planning in Different Environments:

- In tool-room type manufacturing, "make a part as per drawing" is sufficient
- In a metal-forming type of operations, the process planning requirements are embedded directly into the die.
- Process planning is fairly trivial
- Job-shop type manufacturing requires most detailed process planning
- Design of tools, jigs, fixtures and manufacturing sequence is dictated directly by the process plan.

7.5.4 Requirements for Process Planner:

- Must be able to analyze and understand part requirements.
- Have extensive knowledge of machine tools, cutting tools, and their capabilities.

This is the detailed explanation of Process Planning. Now, let's discuss Computer-Aided Process Planning.

7.5.5 Computer-Aided Process Planning (CAPP):

It can be defined as an act of preparing processing documentation for the manufacturing of a piece, part or an assembly, etc. is called as process planning. If process planning was done by using a computer it is called Computer-Aided Process Planning(CAPP).

This post mainly focuses on, the structure of Computer-Aided Process Planning (CAPP) in a detailed manner.

COMPUTER-AIDED PROCESS PLANNING(CAPP) METHOD:

- It can systematically produce accurate and consistent process plans.
- It can reduce the cost and lead time of process planning.
- Less skilled process planners may be employed.
- It increases the productivity of process planners.
- Manufacturing cost, manufacturing lead time and work standards can easily be interfaced with the CAPP system.

7.5.6 Why Computer Aided Process Planning(CAPP)?

- Understand the interactions between the part, manufacturing, quality, and cost.
- Systematically produce accurate and consistent process plans.
- Reduce the cost and lead time of process planning.
- Skill requirements of process planners are reduced.
- Increased productivity of process planner.
- Easily interface with other application programs for further analysis.

This is the detailed explanation of Computer-Aided Process Planning. Now, let's discuss the parts of it. They are:

1. **Generative Computer Aided Process Planning (G CAPP)**.
2. **Variant Computer Aided Process Planning (Variant CAPP)**.

3. **Retrieval Computer Aided Process Planning (Retrieval CAPP).**

The detailed explanation of all these process planning is as follows:

7.5.7 Generative Computer Aided Process Planning(G CAPP):

A system which automatically synthesizes a process plan for a new component is called Generative Computer Aided Process Planning. It synthesizes the process information to create a process plan for a new part automatically without human intervention

Characteristics of Generative Computer Aided Process Planning(G CAPP):

- No existing standard plans.
- Able to generate process plans for both new and existing parts.
- Process plans are generated by means of:
  - Decision logic.
  - Formulas.
  - Technology algorithms.
  - Geometry based data.
  - Geometry-based coding scheme.
  - Process knowledge in the form of decision logic and data to perform uniquely the main decisions for converting apart from raw materials to a finished state.

7.5.8 Variant CAPP:

A process plan for a new part is created by recalling, identifying and retrieving the existing plan for a similar part and making necessary modifications for the new part. In this article, I am going to discuss Advantages and limitations of VARIANT CAPP (VCAPP) in a detailed manner.

Steps involved in VARIANT CAPP are as follows:

- Define the coding system.
- Group the parts into part families.
- Develop a standard process plan.
- Retrieve and modify the standard plan.

7.5.9 Retrieval CAPP:

- Based on the principles of GT.
- Also called a VARIANT Computer Aided Process Planning**(Variant CAPP)**.
- GT: Group Technology.
- The concept of grouping parts together depending upon their similarities in operation sequence or geometry is called Group technology.
- Experts' knowledge and standard process plans as per GT are needed as a database.
- Considerable work is required to collect and organize data.

Salient points of VARIANT CAPP:

- Easy to build, learn and use.
- Experienced process planners are still required to edit the process plan.
- Cannot be used in an entirely automated manufacturing system without additional process planning.

7.6 KEY POINTS

- MIS stands for Management Information System. It is a collection of people, procedures, data, and information technology that aids managers to make informed decisions.
- Computerized information systems are more efficient compared to manual information systems. Manual information systems are cheaper compared to computerized information systems.
- Transaction processing systems (TPS) are by operational staff to record day to day business transactions, and they are used to make structured decisions
- Management Information Systems (MIS) are used by middle-level managers to make semi-structured decisions
- Decision Support Systems are used by top level managers, and they help top level managers to make unstructured decisions.
- Computer-Aided Process Planning can be defined as an act of preparing processing documentation for the manufacturing of a piece, part or an assembly by using a computer.
- Critical Success Factors (also known as Key Results Areas or KRAs) are the areas of your business or project that are vital to its success.
- Identifying and communicating CSFs within your organization is essential to ensure that your business or project stays focused on what needs to be done to achieve success. It can also help you to avoid wasting effort and resources on less important areas of the business.

7.7 QUESTIONS

1. Explain significance of technology management ?

2. Explain types of MIS?

3. What Is A Strategic Planning Model?

4. Explain Four Main Types of Critical Success Factors?

5 Explain Five Steps to Identify and Develop Your CSFs?

6. Explain **COMPUTER-AIDED Process Planning(CAPP) Method?**

7.8 REFERENCES

- Strategic Management and Business Policy: Globalization, Innovation and Sustainability | Fifteenth Edition | By Pearson
- Strategic management author: **pearce**
- Management Information Systems: Managing the Digital Firm by Kenneth Laudon (Author), Jane Laudon (Author)
- https://www.wiley.com
- https://www.academia.edu/9464635/Strategic_Roles_of_information_Systems_Introduction

8

INFORMATION SYSTEM DEVELOPMENT AND SECURITY

Unit Structure

8.0 OBJECTIVES

- The main objective of learning this MIS is to provide information for decision making on planning and controlling the operations of the organizations.
- The meaning of management in MIS meant to cover the planning, control, and administration of the organizations.
- Information means the processed the data that helps the management in executing the planning, controlling and operations.

8.1 INTRODUCTION TO MIS

- The main goal of MIS is to help the organizations to design, implement and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program.

- It also helps in analysing a situation in which it provides all the relevant information about the situation and then executing the decision.

1.2 INFORMATION SYSTEM DEVELOPMENT AND SECURITY

Information System Development:

- In MIS, information is considered as a major resource such as time and capital.
- These resources need to be handled carefully and it is required by the management for decision making.
- So this information becomes vital resource for the system.
- The management information system needs good planning.
- The system should deals with the management information system and not with the data processing system in the organization.
- It supports the management in better planning and decision making and actions.
- It should support the management planning and its needs as per the changing take place in the organizations.

Major challenges in MIS Implementation are:

- The quantity, content, and context of information that how much data is required and what exact data should be described.
- Then change in the nature of analysis and presentation of information.
- The accuracy of information.
- The reliability of information.
- The authentication and security of the system.

Planning of MIS: MIS development and design process has to be undergo to addressed these issues:

- There is being an effective way of communication among the users and the developer's teams.
- There is a proper synchronization in knowing the process management and the IT teams as well the users and the developer's teams.
- There should be proper understanding of information needs and challenges amongst the managers from different functional areas and the combing these needs into single interrelated system as a whole.
- There should be a proper utilization of fast growing change in IT capabilities in the best possible ways.
- The time and cost required for installing the IT based systems is high, which says that there should be no need for frequent change and major modifications.

- It should take care of not only the systems, users but also the employees, stakeholders, customers and its suppliers.

Once the organization planning is over, the designing of the system should take place for the achievement of MIS goals and its objectives.

- **The Strategy for Development:** example an online and real time batch processing.
- **System Development Strategy:** the designers should select an appropriate approach for the system development process like operational verses functional and accounting verse analysis**.**
- **Resources required for the Development Process:** resources selection should be appropriate and should be done by the designer so that waste of resources should be taken place in the process of development.
- The manpower (staff) should good analysts and programmers**.**

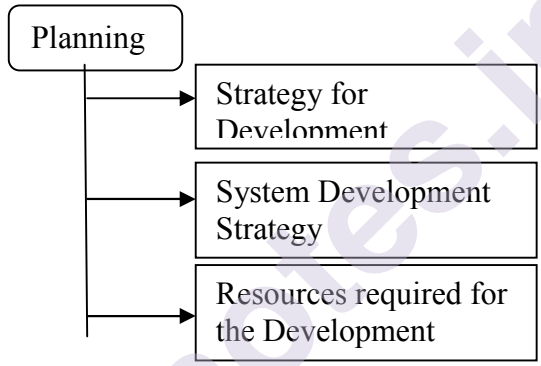


Figure (a)

Information system planning essentially involves

- Identification of the stage of information system in the organization.
- Identification of the application of organizational IS.
- Evolution of each of this application based on the established evolution criteria.
- Establishing a priority ranking for these applications.
- Determining the optimum architecture of IS for serving the top priority applications.

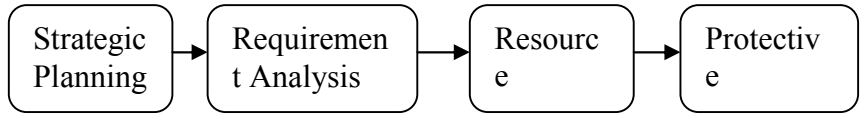


Figure (b)

Information System Requirements:

- There are three methods involve in determining the requirement in developing a management information system for any organization

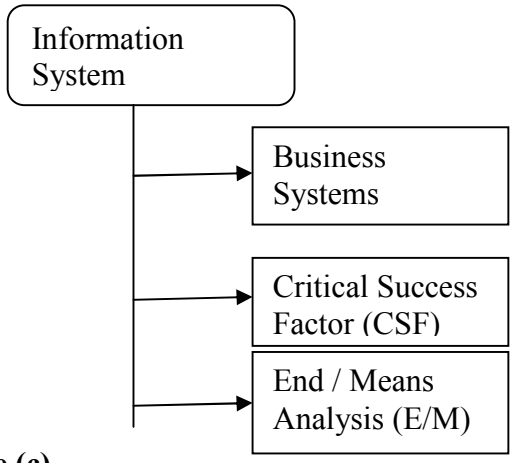


Figure (c)

1) Business Systems Planning (BSP):

- This method is developed by IBM.
- It determines the priorities of the organization and focuses the data which is maintained in the system.
- It uses data architecture which is supported by the different applications.
- It defines data classes and different matrices which are used to define relationships among the organization.

2) Critical Success Factor (CSF):

- It defines the key business goals and its strategies for each manager and its business.
- It also takes the critical success factors for achieving the business goals.

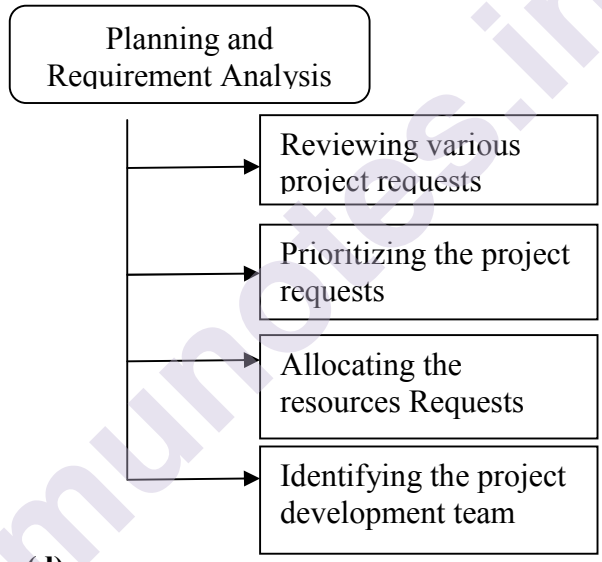
3) End / Means Analysis (E/M):

- It determines the outputs and services which is provided by the business processes.

8.3 INFORMATION SYSTEM DEVELOPMENT PROCESS AND MODELS

- In MIS, the information is recognized as a major resource like capital and time.
- To manage properly this resource the management has to plans for it and control it, so that the information becomes a vital resource for the system.
- It requires good planning.

- It deals with the management information and not with the data processing.
- It should provide the management with good support for the management planning, decision making and actions.
- It should provide the support to the changing needs and requirement of the business management.
- System development requires a careful analysis and design before the implementation of the system.
- The requirement analysis involves in understanding the organizational goals, processes and the constraints of the system for which the information system is being designed.
- The following are the phases of the system implementation:



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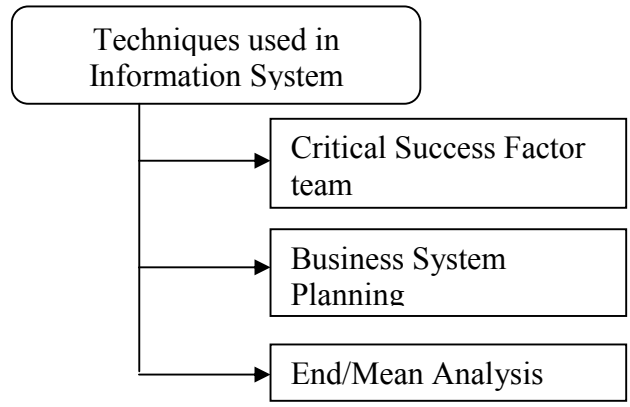


Figure (e)

- **The requirement analysis has the following sub-processes:**

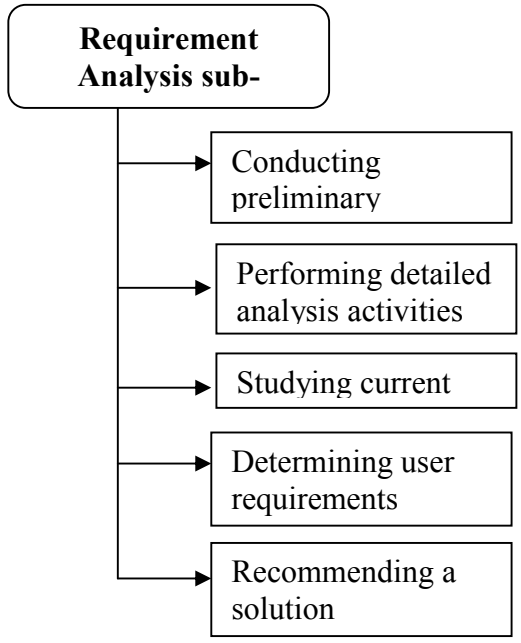


Figure (f)

Technology for Information Systems:

- The technology requirement for any organizations are

a) Devices.
b) Data center systems: it is an environment which provides processing of data, storage, networking, management and the distribution of data within an enterprise or system.
c) Enterprise software: the software like ERP, SCM, Human Resource Management, etc. which is used to fulfil the needs and objectives of the organizations goals.
d) IT services: it is related to the implementation and management of quality of IT services by IT service providers through people, process and information technology.
e) It includes various process improvement frameworks and methodologies like sigma, TQM.
f) Telecom services.

Information System Analysis and Design:

- System analysis and design follows the typical System/Software Design Life Cycle (SDLC). It generally passes through the following phases :

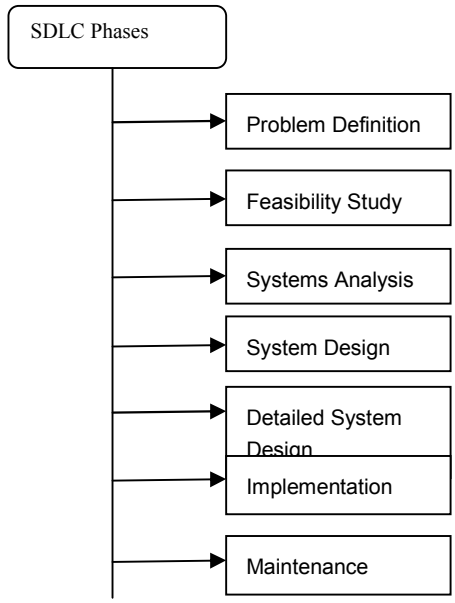
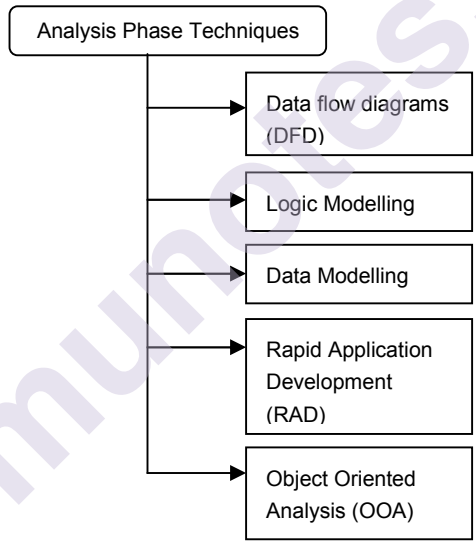


Figure (g)



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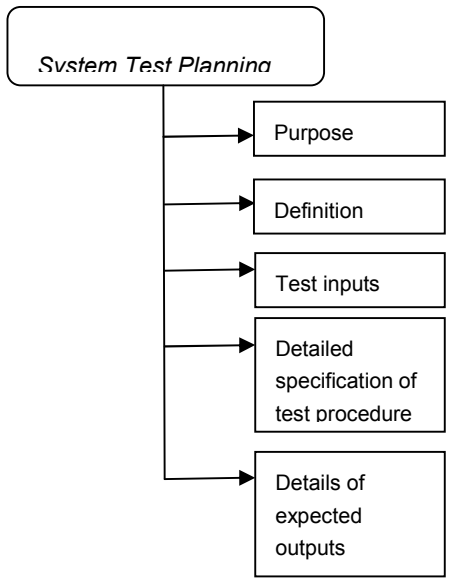

Figure (i)

8.4 SENSITIZE STUDENTS TO THE NEED FOR INFORMATION SECURITY

- Providing training and making aware about the knowledge to efficiently use the tools and become better defenders of the organization.
- This may helps them to assist them to better manage other tools which are not meant for security.
- To give protection to any information from a range of threats.
- Ensure business continuity.
- Minimizes financial loss.
- Optimizes return on investments.
- Increases business opportunities.

8.5 CONCEPT SUCH AS CONFIDENTIALITY, INTEGRITY, AVAILABILITY

Information Security:

- An information security is not about the securing the information from unauthorized access.
- It is a good practice of preventing the unauthorized access, use, disclosure, disruption, modification, inspection, recording, or destruction of information.
- The information can be a physical one or electronic one.
- The information can be any users' details like name, or profile on social media, the data ion mobile phone, your biometrics etc.
- The information security programs are build on three objectives that are known as CIA:

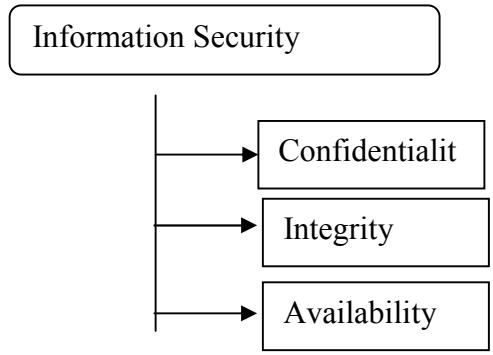

Figure (j)

1) Confidentiality:

- It is meant to hide the information of any users from unauthorized access.

2) Integrity:

- It is used to maintain accuracy and completeness of data.
- It is used to secure the data by unauthorized data editing.

3) Availability:

- It is used to make the data available whenever required by the users.
- For example any one needs to access the information of a particular employee to check whether the employee has outstand the number of leaves, in that case it requires collaboration from different organizational teams like network operations, development operations.

8.6 TYPES OF THREATS AND RISK

- Many areas of engineering and infrastructure have developed their own disciplines and terminology for risk analysis.
- Widely for all information assets of an enterprise.
- During the development of new products or system for example in the area of software security.
- Therefore calculate risk as a function thereof informally,

Risk = Assets*threats* vulnerabilities

1) Vulnerability :

- Vulnerabilities are weakness of a system that could be accidentally or internally exploited to damage assets.
- Vulnerability scanner provides a systematic and automatic way of identifying system vulnerabilities.
- It can be rated according to their impact.

2) Threats:

- Threats are actions by adversaries who try to exploit vulnerabilities to damage assets.
- It is possible danger to the system.

3) Risks:

- Having rated values of assets, the critically of vulnerabilities and the likelihood of threats, can give the result of calculating risks.

4) Counter Measures:

- The result of a risk analysis is prioritized list of threats, together with recommended countermeasures to mitigate risk.
- Risk analysis tools usually come with a knowledge base of countermeasure for the threats they can identify.

- Information security threats is something related like

1) Software attack.
2) Theft of intellectual property.
3) Identity theft.
4) Theft of equipment or information.
5) Information extortion.

Threat:

- In any events or certain circumstance where there is a potential to harm the information systems through unauthorized access, destruction, disclosure, modification of data of denial of service.

Software attack:

- Software is attack by virus, worms, Trojan horses etc. Many times it is believed that malware, worms, Trojan horse are the same but actually they all are different.
- Only one thing is similar in all theses virus is that they all are malicious software and they all behaves very differently.

Malware:

- It is a combination of two terminology that is malicious and software.
- It is implemented using the program code which is designed2zx4r to perform malicious operation on the system.
- It can be divided into two parts:

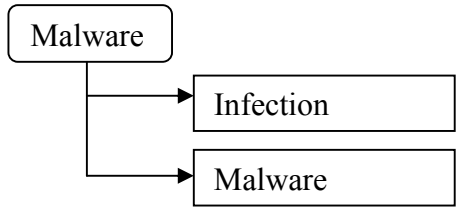

Figure (k)

Malware on the basis of the infection methods are as follows:

1) Virus:

- Virus has the ability to replicate themselves by getting into the program on the host computer like songs, video etc. and they it will travel on the way to internet.
- The creeper virus was first detected by ARPANET example like file virus, macro virus, boot sector virus , stealth virus, etc

2) Worms:

- It is reverse replicating in nature.
- They can easily travel from one network to another if they target machine available in the network.
- These are less harmful in nature for example consumes hard disk space.

3) Trojan:

- The concept of Trojan is completely different from other virus and worms.
- The main target is to conceal them into the software.
- For example FTP Trojans, proxy Trojans, Remote Access Trojans etc.

4) Bots:

- It is an advance form of worms.
- It is automated processes.
- It is designed to interact over the network.

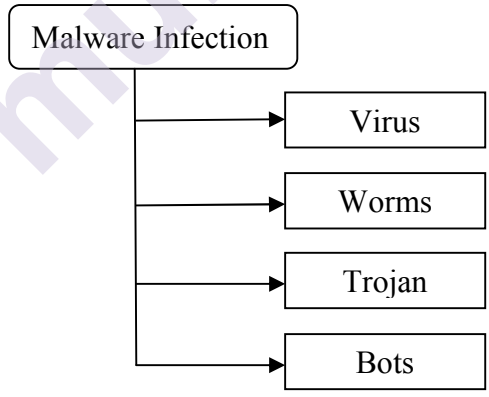

Figure (l)

Malware on the basis of Action are as follows:

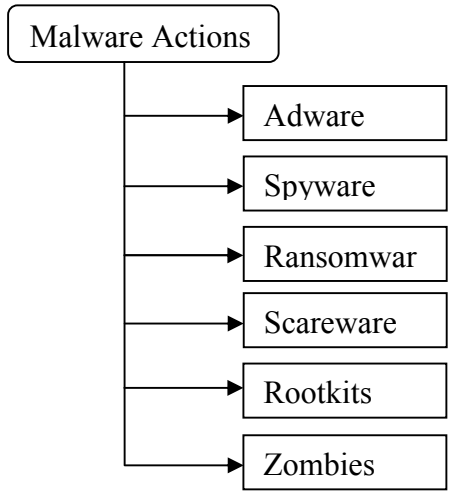

Figure (m)

1) Adware:

- It is not malicious in nature.
- It can violate the privacy of the users.
- They normally come with attached with free-to-use software or reside in the individual programs.
- They examine the interest of the users and display the relevant ads.
- It embeds the malicious code into the software and examines the activity of the users.

2) Spyware:

- It is a program that monitors the activity of the users on the machine and reveals the collected information to an interested party.
- Common example of spyware is KEYLOGGER.
- Keylogger is basically used to record the user keystrokes with timestamp.
- It collects the information like username, passwords, credit card details etc.

3) Ransomeware:

- It tries to encrypt the files or will try to lock the computer making it accessible either fully or partially.

4) Scareware:

- It acts like as it is helping the users to fix the problems and once the software is executed it will infect the system or it will completely destroy the system.
- Then the software will display messages stating that they are trying to solve the problems and tell you to pay them to fix the problems.

5) Rootkits:

- It is used to gain the access to the system root and try to administrate the privileges in the user system.
- Once it's get the access to the root the attacker can do anything from stealing to the private files to private data of the user.

6) Zombies:

- It is similar to spyware.
- The pattern of infection is similar to spyware but they don't spy and steal information.

8.7 OVERVIEW OF SOME MANUAL

- The processes refer to Work Practices or workflow.
- It is a repeated step to accomplish business objectives.
- IT infrastructure could include:

1) Helpdesk and service management.
2) Incident reporting and management.
3) Change requests process.
4) Request fulfilment.
5) Access management.
6) Identify management.
7) Service level and third party services management.
8) IT procurement process.

- **Network Infrastructure:**

1) Cabling, data and voice network and equipment.
2) Telecommunication services including VoIP services, ISDN, video conferencing.
3) Server computers and associated storage services.
4) Operating software for server computers.
5) VPNs and virtual environments.
6) Remote access services.
7) Wireless connectivity.

- **Application software:**

1) Finance and assets system, including accounting package, inventory management, HR systems, Assessment and reporting systems.
2) Software as a service (Saas) instead of software as a packaged or custom made product etc.

- **Physical security components:**

1) CCTV cameras.
2) Clock in system and biometrics.

3) Environmental Management System: Humanity Control, Ventilation, Air Conditioners, Fire Control Systems.
4) Electricity and power backup.

- **Access devices:**

1) Desktop computers.
2) Laptops, ultra-mobile laptops and PDAs.
3) Thin client computing.
4) Digital cameras, Printers, Scanners, Photocopier etc.

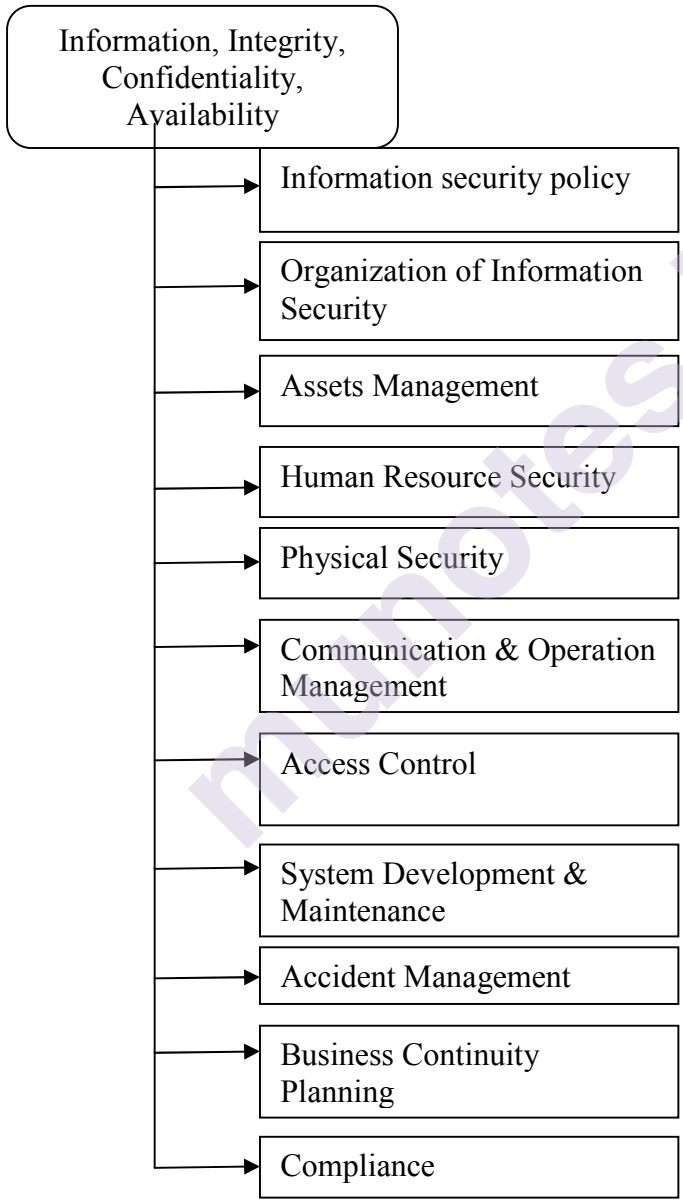

Figure (n)

8.8 PROCEDURAL AND AUTOMATED CONTROLS IN REAL LIFE IT ENVIRONMENT

- In any business environment where the processes, operations, accounting and decision making are carried out with the help of computer systems are called as Automated Environment.
- Nowadays in every organization computer system are almost being used to carry out their business processes.
- The main goal of automated environment is to carry out the task with less manual intervention and more system oriented.
- The level or range of complexity of any organizations is depends upon on the level of use of automated environment.

Charactertics of Automated Environment in IT environment are:

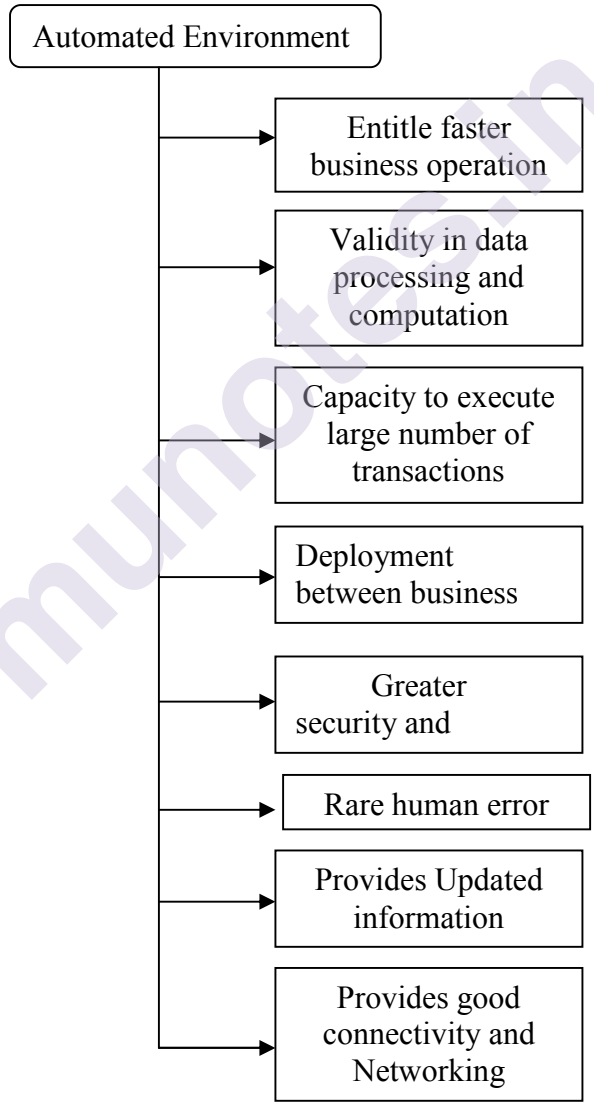

Figure (o)

8.9 COMPUTER CRIME- PRIVACY ISSUES

- Computer crime refers to committing illegal activities such as committing fraud, trafficking and intellectual property, stealing identifies and violating the privacy of an individual entity.
- It is a target of illegal activity.
- The attacker has main objective to deny the owners or legal users of the system.
- These are malicious code that tries to infect the system for processing illegal activity.
- It can be protected or we can say to eliminate the impact using Antivirus software.

Example of computer crime is:

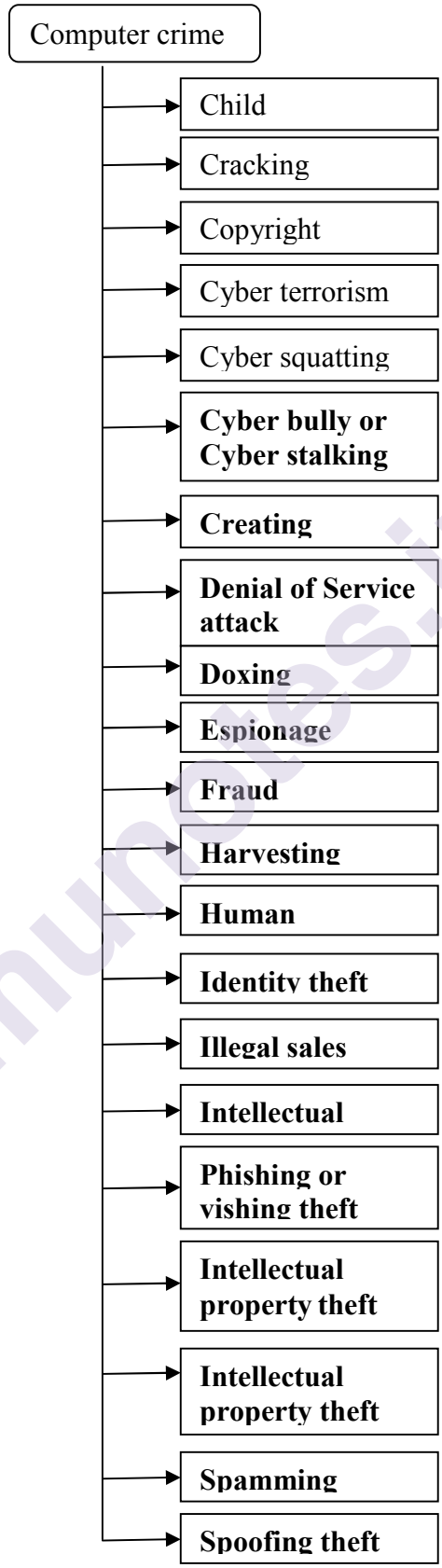

Figure (m)

8.10 SUMMARY

- MIS has created an impact on the organizations function performance, and productivity.
- Information system and information technology have become very important part of any successful business and is regarded as a major functional area.
- A well established management information system supports the organization at different levels.

8.11 REFERENCE FOR FURTHER READING

https://www.geeksforgeeks.org/what-is-information-security/?ref=lbp

https://www.tutorialspoint.com/management_information_system/mis_development_process.htm

https://www.slideshare.net/ahmedmoussaa/information-security-8332632

https://sgp1.digitaloceanspaces.com/cakart/5973/study_contents/Chapter_6__Audit_in_an_Automated_Environment.pdf

8.12 BIBLIOGRAPHY

https://www.geeksforgeeks.org/what-is-information-security/?ref=lbp

https://www.tutorialspoint.com/management_information_system/mis_development_process.htm

https://www.slideshare.net/ahmedmoussaa/information-security-8332632

https://sgp1.digitaloceanspaces.com/cakart/5973/study_contents/Chapter_6__Audit_in_an_Automated_Environment.pdf

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