UNIT IV

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STRATEGIC INFORMATION SYSTEM (SIS)

A strategy is defined as an organisation's activities and plans designed (i) to match the organisation's objectives with its mission and (ii) to match the organisation's mission to its environment in an efficient and effective manner. Strategic management is the process used to develop, refine and implement actions in order to achieve the desired outcomes determined by each organisation level, is in conformity with other policies of unit manager, with approval of supervisors, users and together with the management.

A growing number of business firms are developing strategic information systems plans for managing the information system resources of their organisations. This planning involves a study of how the information systems function can contribute to the achievement of the goals contained in the strategic plan for the entire organisation. This process is sometimes called Enterprise Analysis.

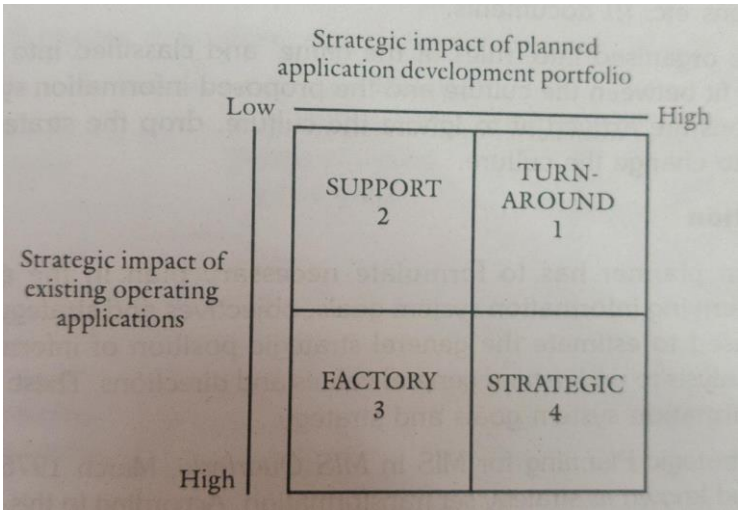
Following are the benefits of SIS: (i) It pinpoints ways to achieve competitive advantage of using information systems as a strategic weapon (ii) It stimulates the creative use of information systems technology and encourages innovation in applying it to needs of the organisation, (iii) It redeploys financial and human resources to the most important and Strategic Information systems projects for the business. (iv) It encourages the integration of existing and future in systems to eliminate information redundancies and inconsistencies and inefficient use of information systems. (v) It establishes priorities and time-frame for the development in the future.

Objectives and strategies organisational plan:

I. Derivation from the organisational plan: If the goal of the organisation is to achieve highest sales than its competitors provide information support for the sales department. (ii) If the plan of the organisation is to establish a good quality control department establish a good quality control database. (ii) If the objective of the organisation is to implement quality circles provide quality control reports suitable for quality circles and design access procedures to obtain, data for the quality circle from quality control database.

II. Strategic Grid: A contingency approach to decide on the information planning effort known as strategic grid. This grid defines four types of Information systems planning situations depending on the strategic impact of the existing Information systems applications portfolio and the strategic impact of the portfolio of applications planned for development. These are classified into four positions to define the position of the information in the activity related to the organisation.

The Strategic Grid



Strategic position - In this case, information system activities are critical not only to the current competitive strategy, but also to the future strategic directions of the enterprise. Information systems applications are part of new strategic decisions. Strategic position in the grid needs significant general management guidance. In addition integration of corporate planning and information systems planning is required. There is need for smooth functioning of information systems activity. This falls in quadrant 4.

Factory - Here, Information system applications are vital to the successful functioning of a well-defined, well accepted activities. But Information systems are not of future strategic operations and hence shown in quadrant 3. Factory position in the grid needs less involvement from top management. Guidance from corporate plan to maintain information systems alignment is required. Detailed operational and capacity planning by information system function .

Support: It is represented in quadrant 2 wherein it can be noticed that information system applications are useful in supporting the activities of the organisation. Information system activities are not essential to critical operations and hence not included as part of future strategic directions. Support involves little top management involvement and as well as little or no guidance from corporate plan This is represented in quadrant 2.

Turnaround: Turnaround is a transition stage from support to strategic grid. Earlier the organisation had support type application but now intends to plan for applications vital to strategic success of the organisation (represented in quadrant 1). For turnaround position, in the grid needs significant general management guidance.

The strategic information system (SIS) grid is a diagnostic tool to understand the information system. The position of the grid shows whether any involvement of the top management is needed and indicates the relationship of the information system plan and the organisational plan. The disadvantage of this grid is that it explains the present, not the future (what is happening, not what should happen). Further if an organisation desires to be more strategic in its use of information systems, the grid provides no basis for deciding the same.

III. Strategic fit with Organisation Culture

Each organisation has a culture which would reinforce: 1. Values 2. Norms and 3.Beliefs.

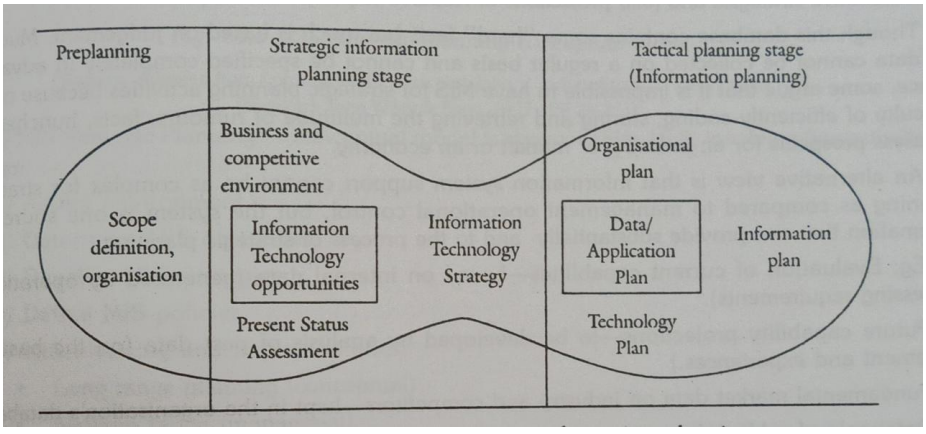
Goals, objectives and strategy for information system should align with the culture to avoid high resistance and high risk of failure. To achieve this, information system planners should be aware of the culture and get clues from sources like (a) stories or incidents repeated in the organisation, (b) meetings, (c) top management behaviour, (d) physical layout, (e) Ritual like banquets, parties, orientations etc. (f) documents.

COMPONENTS OF STRATEGIC INFORMATION PLANNING

The purpose of strategic planning is to develop strategies by which an organisation will be able achieve its objectives. The time horizon for strategic planning tends to be fairly long, so that fundamental shifts in the organisation may be made. eg: A company manufacturing industrial products may decide to diversify into consumer lines. Information systems planning is divided into three processes.

1.Strategic 2. Tactical 3. Operational

Components of Strategic Planning



There are nine major components of strategic information planning which can be grouped into preplanning, strategic planning and tactical planning stages.

The first component of strategic information planning is a preplanning stage called scope definition and organisation. The consultants meet with the top management of the organisation to define the scope of the planning effort and develop methods to organise, guide and schedule the planning process. The executive steering committee and study team of consultants and manager are included in this. The commitment of the top management to be involved in the planning effort, and securing the cooperation of managers throughout the organisation are demonstrated.

The next four components of strategic information planning are specially designed to accomplish strategic information systems planning. They are to assess an organisation's competitive environment to be used strategically for competitive advantage. The final product of this strategic planning is called Information Technology Strategy (ITS). This results in an information architecture that develops a general design for the organisation in the areas of strategic information systems, automation, centralisation, decentralisation, the integration and management of information resources.

The last four components of this are to accomplish tactical information systems planning (also known as information planning). It produces an organisation plan for information systems management and application development. A data application plan and a technology plan are developed which specify the data architecture and, major hardware/software and telecommunication network requirements of the organisations. The implementation plan defines priorities and schedules required for information systems development projects. Strategic planning activities do not have to occur on a periodic regular cycle as do management control activities. They can be somewhat irregular although some strategic planning can be scheduled into yearly planning and budgeting cycle. Data requirements for this are generally for processed summarised data from a variety of sources (includes more external data). These are economy in the company’s (i) current and prospective areas of activity, (ii) current and prospective political environment, (iii) current capabilities and performance of the organisation by market, country etc. (based on current policies), (iv) prospects for the industry in each country, (v) capabilities of competitors and their market shares, (vi) opportunities for new ventures (based on current or expected developments), (vii) alternative strategies and (viii) projections of resource requirements for point. Though this database contains some “hard” facts but much is based on judgement. Much of the data cannot be collected on a regular basis and cannot be specified completely in advance.

Hence, some argue that it is impossible to have MIS for strategic planning activities because of the difficulty of efficiently coding, storing and retrieving the multitude of rumours, facts, hunches etc. to assess prospects for an industry, a market or an economy.

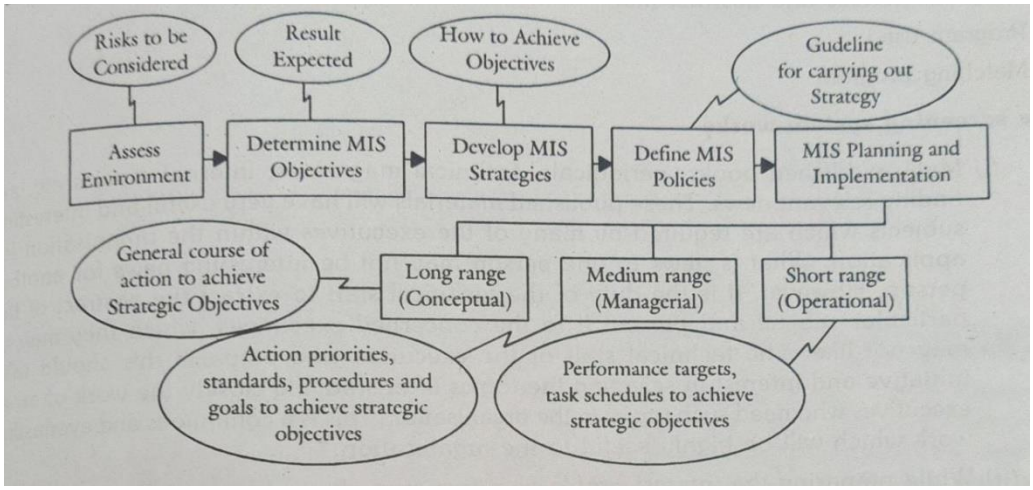
An alternative view is that information system support cannot be as complex for strategic planning as compared to management operational control, but the system is one source of information that can provide substantially and to the process of strategic planning. Eg: Evaluation of current capabilities—based on internal data (generated by operational processing requirements).

Future capability projections - to be developed by analysis of past data (on the basis of judgement and experiences.) Fundamental market data on industry and competitors—kept in the organisation's database.

Databanks of public information regarding the industry and competitors—purchased in machine readable form for use with planning and decision models.

Strategic information system - The threats and opportunities faced by business change, and keeping up with them is the continuous education program, no Manager can afford to miss. The internal threats may be outgrowth of the organisation, ineffective supervision, too large a workforce ,too little training and skills and may be creating costs, The opportunities and threats are detected by alertness to development in the markets, technologies, political environment, foreign markets, competitor's moves and strategies, government regulations etc.

MIS Strategic Planning Conceptual Model



The sources of information are six: personal observation and conversation, news service and internal reports, intelligence data, system data, long range planning systems, special reports based on retrieval of data from the database and computing systems designed to study strategic questions. Several types of teleprocessing system can serve to extend the individual manager's ability to communicate with others. In addition to telephone, there are videophones

and electronic message systems linking automated offices and the management control room linked to a computer centre.

MIS Strategic Planning involves five activities 1. Assess environment 2. Determine MIS objectives 3. Develop MIS strategies 4. Define MIS policies 5. MIS planning and Implementation – Long range planning (conceptual), Medium range planning (managerial) and Short range (operational).

EXECUTIVE INFORMATION SYSTEMS (EIS)

Executive information systems (EIS) are information systems that combine many of the features of management information systems and decision support systems. Initially their focus was on meeting the strategic information needs of the top management. Thus, the first goal of executive information systems was to provide top executives with immediate and easy access to information about a firm's critical success factors (CSF's), that is, key factors that are critical to accomplishing an organization's strategic objectives. For example, the executives of a department store chain would probably consider factors such as its sales promotion efforts and its product line mix to be critical to its survival and success.

Rationale for EIS – Top executives get the information they need from many sources. These include letters, memos, periodicals, and reports produced 'manually or by computer systems. Other major sources of executive information are meetings, telephone calls, and social activities. Thus, much of a top executive's information comes from non-computer sources. Computes-generated information has not played a major role in meeting many top executives' information needs.

Therefore, computer-based executive information systems were developed to meet the information needs of top management that were not being met by other forms of MIS. Executives and IS specialists have capitalized on advances in computer technology to develop attractive, easy-to-use ways to provide executives with the information they need. Software packages are now available that support EIS on mainframe, midsize, and networked microcomputer systems.

Executive information systems are still faced with resistance by some executives, due to high costs, and have had many publicized failures. However, the use of executive information systems is growing rapidly. They have spread into the ranks of middle management as more executives come to recognize their feasibility and benefits, and as less-expensive microcomputer-based systems for client/server networks become available.

For example, according to a study, 25 percent of the world's corporate executives are likely to be using an EIS. One popular EIS software package reports that only 3 percent of its users are top executives. Another example is the EIS of Conoco, one of the world's largest oil companies. Conoco's EIS is used by most senior managers, and by over 4,000 employees located at corporate headquarters in Houston and throughout the world. Thus, executive information systems are becoming so widely used by Managers, analysts, and other knowledge workers. More popular alternative names are Executive Support Systems (ESS), Enterprise Information Systems (EIS), and Management Support Systems (MSS). These names also reflect the fact that more features, such as DSS and expert system capabilities, electronic mail, and personal productivity aids-such as electronic calendars, are being added to many systems to make them more attractive to executives.

Features of EIS

1.EIS are relevant for top management of an organisation, the level at which strategic decisions affecting the organisation as a whole or its major parts are made.

2. ES cut across the functional areas. These systems may derive data from different functional areas but the decisions that are made by integrating these data are not meant for any specific functional area but for the organisation as a whole.

3. Since top management relates the organisation with its relevant environment, often EIS combine both external and internal information. While external information is related to customers, suppliers, competitors, and government policies, internal information is related to the working of the entire organisation.

4. Most of the time, information generated through EIS is in the forms of summary reports and graphics. These forms of information help the executives to draw conclusions about the underlying phenomena quickly without wasting much of their time.

5. Executives are helped by EIS coaches and chauffeurs. An EIS coach is a member of the executive's staff, information services, or an outside consultant who provides help in setting up the EIS. An EIS chauffeur is a member of the executive's staff who operates the equipment for the executive.

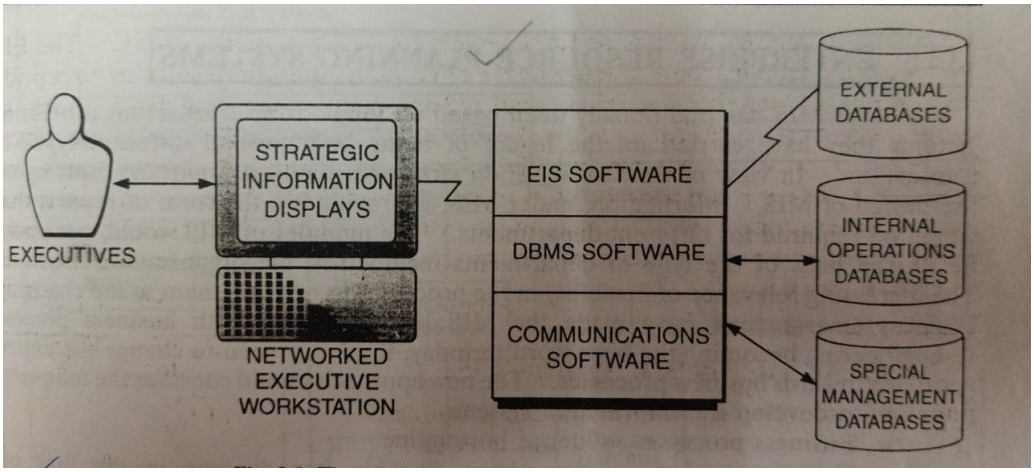
COMPONENTS OF AN EIS

Executive workstations in an EIS are typically networked to mainframe or midsize systems or LAN servers for access to EIS software. The EIS package works with database management and telecommunications software to provide easy access to - internal, external, and special management databases (such as multidimensional analytical

databases) with almost instantaneous response times, Executive information systems provide information about the current status and projected trends in a company's critical success factors, as determined by its executive users. An analytical modeling capability to evaluate alternatives for decision support is also provided by newer EIS packages, as are some expert system features, such as an explain capability.

An EIS, information is presented in forms tailored to the preferences of the executives using the system. For example, most executive in information systems stress the use of a graphical user interface and graphics displays that can be customized to the information preferences of executives using the EIS .Other information presentation methods used by an EIS include exception reporting and trend analysis. The ability to drill down, which allows executives to quickly retrieve displays of related information at lower levels of detail, is another important capability of an EIS.

Components of EIS



Benefits of Executive Information System (EIS):

1. Are tailored to individual executive users.
2. Extract, filter, compress, and tract critical data. Provide online status access, trend analysis, exception reporting, and "drill-down" capabilities.
3. Access and integrate a broad range of internal and external data. Are user-friendly and require minimal or no training to use.
4. Are used directly by executives without intermediaries.
5. Present graphical, tabular, and/or textual information.

Executive Support System (ESS) –

1**.** Are EIS with additional capabilities.

2. Support electronic communications (e.g., E-mail, computer conferencing, and word processing).

3.Provide data analysis capabilities e.g., spreadsheets, query languages, and decision support systems).

3.Include personal productivity tools (e.g., electronic calendars, Rolodex and Tickler files).

OFFICE AUTOMATION SYSTEMS (OAS)

Office automation systems are computer based information systems that collect, process, store and transmit electronic messages, documents and other forms of communications among individuals, work groups and organisations. Such systems can increase the productivity of managerial end users and other professional and staff personnel by significantly reducing the time and effort needed to produce, access and receive business communications.

The information systems developed to make offices more efficient was called the Office Automation Systems (OAS). Office automation may be defined as a separate sub-system included within information processing. It includes a wide-range of support facilities for knowledge work and clerical activities. Examples are: (i) Word processing (ii) Electronic mail (iii) Electronic filing (iv)Data and voice communications.

That is, the office automation systems used in organisations are: (i) Office publishing systems are word processing and desktop publishing systems.

(ii) Image processing systems are image processing, optical scanning and storage, document management and interactive video systems.

(iii) Electronic communications systems are electronic meeting, tele-conferencing and telecommunicating systems. Office support systems are electronic calendar, ticket file, notebook, and directory systems, Work scheduling and task management systems. The OAS provided is to be of a great help to the manager, but its greatest contribution was in reducing the burden on the office/clerical personnel. The typical OAS uses computer workstations that can be configured for electronic mail, telecommunications, word processing, electronic files, fascimile machines and so on. The OAS can be an effective integrator shared information systems, billing systems, sales systems, and word processing

led to the development of telemarketing. More recently, OAS and telecommunications have been integrated through voice and image transmissions using voice telephones.

OAS are information systems that create, store, modify, display, and communicate business correspondence, whether in written, verbal or video form. The prevalence of microcomputers in the office, along with new communications technology, computer, and storage products, are causing fundamental changes in the ways the offices conduct their businesses. Over time, however, computers were connected to one another. This connection allowed people not only to share word processing files but also to send messages to one another. With these developments, electronic mail (E-mail) systems were created in which office personnel could generate and send messages to one another. Also, since office workers could access the same files, electronic bulletin boards were created. These are essentially electronic posts on which people can leave public messages. All of these capacities become even more exciting as high quality graphic printers have become affordable. With these printers, many systems gained the ability to process illustrations and graphics as well as text. Facsimile machines were improved and cost reduced, so that documents containing text, illustration and graphics could be inexpensively communicated over telephone lines.

Parallel with the other developments, computer technology was used to improve voice systems. Office telephones were connected to more sophisticated Private Branch Exchange (PBX) systems. Such systems allow workers to have voice mail boxes in which they can leave voice messages for one another.

Video systems were subsequently developed. Large organisations developed video Conferencing capabilities so that people could communicate face to face without travelling. Earlier, such Capabilities were used to connect a few executives in two or three locations and are now used to connect thousands of people. IBM Corporation has connected over 100,000 people in a video conferencing to announce new products. Hypertext versions of encyclopedia and dictionaries are also being created. It allows the reader to follow the see-also link for references.

Limitations in the Development and Use of OAS

Today, there are two important limitations in the development and use of OAS. Much of the required equipment has been developed by different vendors working independently andusing different standards. Hence, machines often cannot communicate with one another. It is difficult to connect computers to copying machines. Part of the problem is technology and balance wherein vendors sometimes have a negative incentive to connect to each other’s equipment. (IBM, AT & T are competitors). As a result, OAS are divided into islands of

capability. There are islands of linked computer's, an island of copying equipment, an island of telephone, an island of video conferencing capabilities. Overtime, these islands will undoubtedly be integrated as customers demand standardisation and connectivity.

The second limitation concerns storage. Non-text data such as graphs or illustrations require substantially more storage than text data. Voice and video data require even more Consequently, it is not possible with today's technology to store large volumes of typed documents in electronic form. Optical disk storage may provide a solution. For getting this book under hypertext version available, you could touch a key and the discussion about optical disks would appear, right here and now.

ROLE OF OFFICE AUTOMATION IN PROBLEM SOLVING

Office automation applications have numerous implications for managers as problems solvers and decision makers. These applications provide managers information quickly and conveniently in the form of hard copy, screen display, video, and audio. With the result, a manager can interact quickly and meaningfully with his superiors, peers, and subordinates. Besides, he can interact with environmental elements lying outside the organisation. In terms of managerial roles, office automation systems provide following advantages:

1. A manager as a monitor in the organisation serves as the nerve of information, receiving information and making its use in decision making, particularly for planning and control. Office automation systems (OAS) provide this information quickly and in the form the manager wishes.
2. As a disseminator, the manager supplies the information to those who work under his supervision, his peers, and his superiors. OAS help the manager to disseminate the information quickly and correctly.
3. As a liaison, the manager receives information from the environment as well as from various organisational units. The extent to which the OAS are effective, the manager can perform his liaison role effectively.
4. As a spokesperson, a manager links his organisation with its environment by providing relevant information to various environmental constituents, such as customers, suppliers, financial institutions, government agencies, and society at large. His effectiveness as a spokesperson depends to a very great extent on how the OAS have been organised and how the manager is using these.

ENTERPRISE RESOURCE PLANNING SYSTEMS

Since MIS has traditionally been based on inputs from transaction Processing systems they have carried on the legacy of being built around different types ‘of “transactions, In view of this, organisation structures have an important bearing on the design of MIS. Information, under MIS, is provided in the form of reports that would be required for different departments, The modules of MIS would, generally, Be on the lines of the type of departments included in the organization structure, The increasing relevance of flexibility in the processes to reorient them to the changing business environment, have made the MIS less relevant. With business process re-engineering becoming the buzz word to today, there is a need to change the entire approach towards business processes. The new approach should consider the following premises to develop the information systems.

1.Business processes influence bottomline.

2. Organisational units, sometimes, become impediments in the flow of information. Inter-departmental communication is the first victim of the increasing size of organisations.

3.Communication plays an important role in bringing about flexibility in the enterprise. The promptness in the flow of information is critical in better resource utilisation.

4. Integration of different business functions such as production, marketing and finance can help in cost reduction and customer orientation of business processes.

With the advancement in networking technology, a new type of information system called the Enterprise Resource Planning (ERP) System has emerged. ERP System integrates all the processes of the organisation with customer-satisfaction and plans the management of the resources of an enterprise. These solutions help in focusing on production capacities, managing logistics and working out financial consequences of each decision rather than just computing costs.

The basic philosophy of the ERP systems is that business processes are to be integrated at all levels, treating all the resources of the enterprise as common resource meant primarily to cater to the changing needs of customers. Recognising that the customer needs keep changing, ERP systems offer adaptability to the changing needs at an improved speed of response.

Benefits of ERP systems

The ERP systems are becoming an important part of the IT strategy of business enterprises. A fairly large number of Indian Companies have also opted for ERP in view of the potential benefits from them. Some of the major benefits of ERP systems are as follows :

(a) Focus on processes: ERP systems are business process oriented systems. They focus on

the activities of business processes. As a result, business goals are clearly articulated. ERPs enable the enterprises to focus on customer's needs.

(b) Flexibility : ERP systems add flexibility to business processes by automating the process itself, rather than automating some functions in the process. Since most of the important processes are automated, there is greater amount of flexibility in the use of resources of the enterprise in different ways and for different purposes. For example, bringing out a new packing of smaller size for cooking oil would not only require changes in the production but also in billing, shipping and marketing processes. The required changes are executed quickly with the help of ERP system as all the concerned processes are automated and integrated to each other. In fact, in SAP, a popular ERP package, there are more than 700 processes that are automated and integrated with each other.

(c) Reduced cycle time: ERP systems integrate various processes with the help of advanced communication links. The transfer of information between the processes is almost automatic and instantaneous.This reduces the cycle time in the process. In processes such as inventory management, debtors realisation, customer billing, shipping, etc. minor reduction in cycle time has considerable impact on the cost of operations. Hindustan Lever Limited has linked its 55 depots all over the country to its distributors who replenish their stocks on a daily basis, substantially reducing their inventory levels.

(d) Improved communication : One of the major benefits of ERP system is establishment of an enterprise-wide communication plan. As a result, there is less resistance to proposed changes due to easy access to information regarding the imperatives for change.

Critical success factors in implementation of ERP system

ERP system are expensive solutions and require a lot of money and time to implement. These systems influence almost all the day-to-day operations in the enterprise and implementation is a challenging job requiring a cautious approach. Some of the critical success factors in implementation of ERP system are :

(a) Discipline: Integration and automation of processes assume a high degree of discipline on the part of those involved in these processes. Since ERPs involve both integration and automation of processes, a high degree of discipline in expected in the organisation implementing it. [For example, SAP (an ERP software package) uses the First-In-First Out (FIFO) method of inventory movement and valuation. In one of companies using SAP, the forklift operator left the materials in the first empty bin he saw instead of putting them into bins that became empty first. After sometime, the suggestions to pick up materials from the bin specified by SAP could not be

implemented as they were still empty. On the other hand, the bins that were to be filled with materials were already full resulting in chaos in the material handling process.] Thus, adherence to the procedures plays an important role in the success of ERP system.

(b) Change in work culture: Willingness to re-engineer processes and sharing of information as a habit are the two basic requirements of work culture in ERP implementing enterprises. Therefore, the 'implementation blues' are less serious in enterprises that have favourable work culture.

(c) Top management support : Implementation of ERP system requires support of the top management and co-operation of all the members of the work-groups involved in the process.

Presently, the ERP systems being offered in India by different vendors (Hindustan Lever Godrej, Cadbury's Tatas, ONGCs etc. are some leading Indian companies implementing ERP systems) are quite expensive and designed in the light of environments more relevant to do, developed markets. Perhaps local vendors would be more useful for Indian companies and customised solutions will have to be developed module by module to be integrated one by one. Another problem with ERP system of today is that they primarily focus on operations rather than planning of resources.

TRANSACTION PROCESSING SYSTEM (TPS)

Transaction Processing System (TPS) supports day-to-day operations. Examples of TPS are order-entry systems, cheque processing systems, accounts receivable systems, accounts payable systems, payroll systems and ticket reservation systems. These systems help any company to conduct operations and keep track of its activities. TPS was first developed in the 1950s in accounting departments of major corporations. It is the oldest type of information system and can be called as the work horse of the information systems industry for the last 50 years.

An event occurs in the business world. It can be a request for a ticket to a dance program or a music program or the presentation of a cheque for payment. The event is recorded by keying it into the computer system as a transaction. The transaction is a representation of the event. Transaction processing program is nothing but a computer program which processes the transaction against TPS data.

Example: In the case of a ticket reservation system, say Railways, the TPS data contains the location of available seats; in the case of an order, this data contains a list of products, available for sale, their prices and related data.

In the case of a cheque processing, this data contains the account balances, customer lists and other data.

TPS program generates two types of outputs:

(i) It sends message back to the operator terminal.

(ii) It generates printed documents.

Example: A ticket reservation system, displays a message on the terminal indicating seats sold out to people. It also prints the tickets and perhaps a mailing label for sending them. There are two fundamental **types of TPS**:

(i)On-line systems (Online transaction processing)

(ii) Batch systems (Batch transaction processing)

On-line Systems - It involves a direct connection between the operator and the TPS program. They Provide immediate results. They are used to process a single transaction at a time. Example: An Order, arrives by telephone call; it is processed at that moment and the results are produced. TPS program is to read data about ticket reservation, \n the order that customers request them and not in the order in which they are stored on the file, **Batch Processing (batch transaction Processing):** This is a second type of TPS, where transactions are grouped together and processed as a unit. Example: A cheque processing system in a bank. All the cheques received in a particular time frame, say, on a particular day, are grouped together. They are then sorted by the account number and processed in a batch.

The transactions are grouped into a transaction file. The batch is then read in order by the TPS program. This program reads the stored data, often called the old master file data, processes the transactions, and creates the new master file data. In the process, it generates reports. To match transaction records with master file records, the master file data is stored in the same way that the transactions are sorted. The actual master file can be of direct access (disks) or sequential (tape) hardware.

In a cheque processing system, the cheques are batched and sorted by the account numbers. The old master file, which is also sorted by the account number, contains customer checking account data from the prior period. This data is updated to create the new customer master file. The outputs may be overdrawn accounts, monthly summaries, suspicious activity etc. The most fundamental computer-based system in an organisation pertains to the processing of business transactions. A transaction is any event or activity that affects the organisation.

Common transactions include the placing of orders, billing of customers, hiring of employees, depositing of cheques etc. The types of transactions vary from organisation to organisation. But all firms have to process some types of transactions as a major part of their daily business activities. The most successful firms carry out this work in an orderly and efficient manner.

Transaction processing is the set of procedures for handling the transactions. Common activities include:

(i) Calculation (ii) Classification (iii) Sorting (iv) Storage (v) Summarisation. These activities occur at the operations level. Similar characteristics which exist in many of the firms are: (i) High volume of transaction noticed, (ii) Similar transactions, (iii) Procedures for processing the transactions are well understood and can be described in detail, (iv) Few exceptions to the normal procedures occur. Hence, routines can be established for handling the transactions.

Computers are essential to process large volumes of transaction data, because they provide speed and accuracy and can be programmed to follow routines without any variance. It is a misconception that computers replace people; they rarely do; many organisations find that by adding computers, they have to hire additional personnel; computers can be given a task which people are not interested to do and the people can focus their attention on other works which is of interest to them.

TPS was able to perform one or more of the following operations :

(i) Storing transaction data to create a file of transaction record

(ii) Sorting, sequencing or arranging records

(iii) Merging the contents of two or more files

(iv) Performing calculations on the file data

(v) Accumulating amounts to develop summary totals

(vi) Storing data for future use

(vii) Retrieving stored data

(vii) Displaying or printing out data and/or reports from files for use by employees and/or managers.

Real Time Processing - It is called (frequently) on-line processing since online capability is required in On-Line Real Time (LRT) processing systems. However, use of this term can be misleading because batch processing systems can use on-line remote job entry devices and on-line direct access files in the Processing a batches of data. OLRT is on line real time processing. Advances in computer hardware and have made a real time capability applicable

to many of the functions of modern information Real time processing means that, not only is input data processed immediately, but output results available fast enough to meet the immediate information needs of end users.

Time Sharing - One form of online processing allows the concurrent use of a computer by a group of individual's which is called Time-sharing. Many users share computer resources at the same time. Schools often adopt time-sharing systems to support their computer curriculums. It allows many students concurrent access to the same computer. The student can create an online link to the computer using a device called a terminal with a keyboard for inputting data and a TV screen for output data. The online link to the computer may use a leased line or regular telephone line. The student receives a set of instructions on how to use the terminal and create the online link. Once the online link is created, the student begins to input his program. At the same time, other students can enter or process their programs. The computer's speed of operation lets it jump from one program to another and process each in the order in which it is received. Time sharing is economically and educationally sound as it lets many students share one computer and allows students independently access the computer and proceed at their own pace.

The main advantage of time sharing is interactive processing which describes the user's ability to interact directly with the computer. Time sharing users seated at terminals send instructions to the computer and receive its response to those commands almost immediately. Telecommunication is not restricted to telephone lines; it may also involve microwave systems, transonic cables, laser beams or communication satellites. Another term associated with telecommunications is teleprocessing. It is a form of telecommunications, but it specifically describes the use of terminals that visually display data. The time sharing of student programs is a good example of teleprocessing.

In the time sharing system, a transfer monitor is required to coordinate the flow of information between the terminals and online storage i.e., secondary storage. It is residing in the central memory and works in conjunction with the time-sharing supervisor and is responsible for the overall operation of the time sharing system.

END-USER COMPUTING

The days of depending primarily on information system professionals to meet their information processing needs are over. Most organisations today can’t keep up with the information demands of their users. So, more and more people are learning to use microcomputers and intelligent terminals as professional workstations to get the information

they need to accomplish their jobs successfully This is known as End Computing. End computing is the direct hands on use of computers by end-users, instead of the indirect use provided by the hardware, software and professional resources of an organisation information service department. This does not mean, end users are not relying on such resources. However, in end-user computing, an information service department plays only a 'supportive role' to an endusers computing resources and efforts. The typical levels in an organisation where traditional and end-user computing are concentrated at the individual, workgroup and departmental levels of an organisation. However, both types of computing can be found at all levels.

End-user computing, the creative use of computers by non-technical users, emerged when personal computers and easy-to-use software combined with a pent-up demand for computer and information resources were available.

Components and application outputs of an end-user computing system. These systems are micro-computer based information systems that directly support both the operational and managerial applications of end-users. Many end-users do not rely solely on their own micro-computer workstations, software packages and databases. They can also rely on the support of software packages, databases, and computer systems at the workgroup, departmental and corporate levels. In addition, many organisations provide information centre ay another source of support for end computing. Information centre specialists serve as consultants to users who need assistance in their computing efforts. Thus, organisations hope to improve the efficiency and effectiveness of end-user computing.

The hardware, software, people and data resources are needed for end-user computing. The hardware resources consist primarily of micro-computer work stations. Microcomputer systems (with peripheral devices) provide the information processing capabilities needed by the user. Sometimes, dumb terminals connected to minicomputers/mainframes are used. These are now replaced by micro-computers with telecommunication capabilities (LAN operating as a network server).

Application software packages for micro-computer system are the primary software resources needed (includes general purpose productivity package for word processing. electronic spreadsheets, database and information management, graphics, data communications and integrated packages other software packages for office automation include desk top publishing, e-mail etc. Other category of software resources is that of fourth generation language (4GL packages).This includes natural and structured query languages (such as Intellect and SQL). Many organisations have made a major commitment of human resources

to end-user computing, takes the form of an ‘Information centre.’ A staff of user consultants consisting of system analysts programmers and technicians are the information centre's biggest contribution, is to educate and assist users in the effective use of microcomputer systems and their many software packages

Personal databases are created and maintained by end-users to support their individual ; activities. End-users may also have access to work group and corporate databases through telecommunication network links. End-users can use the telecommunication capabilities to access external databases.

Categories of end-user computing include Office Automation, Information Management and Retrieval, Decision Support and Application Development.