PAPER – 7: INFORMATION TECHNOLOGY AND STRATEGIC MANAGEMENT

SECTION – A: INFORMATION TECHNOLOGY

QUESTIONS

1. Define the following terms briefly:
   (i) Mobile Software
   (ii) Entity Relationship Diagram
   (iii) Input Devices
   (iv) Network Access Control
   (v) Router
   (vi) Resilience
   (vii) Information
   (viii) Strategic-Level Systems
   (ix) Personal Identification Number
   (x) Validity in Controls
2. Differentiate between the following:
   (i) Centralized Computing and Decentralized Computing
   (ii) Half Duplex Mode and Full Duplex Mode
   (iii) Circuit Switching and Packet Switching
   (iv) Concurrent Audit and General Audit
   (v) Quality Assurance Management Controls and Security Management Controls
   (vi) Presentation Layer and Session Layer of OSI Model
   (vii) Infrastructure as a Service (IaaS) and Software as a Service (SaaS)
   (viii) Batch Processing and Online Processing
   (ix) Random Access Memory (RAM) and Read Only Memory (ROM)
   (x) Plaintext and Ciphertext
3. Write short note on the following:
   (i) Business Process Reengineering (BPR)
   (ii) One-to-Many Relationship in E-R Diagram
   (iii) System Designing Phase in SDLC
   (iv) Electronic Funds Transfer (EFT)
   (v) Repeater
   (vi) Leased Application

(vii) Quality Assurance Management under Managerial Controls

(viii) Smart Cards

(ix) Inference Engine in Expert Systems

(x) Operating System

Data Processing Cycle

4. Discuss the steps involved in Data Processing Cycle.

Network Virtualization

5. In reference to Network Virtualization, describe major applications of the concepts of the virtualization.

Network Topology

6. Discuss Ring and Mesh network. List also their advantages and disadvantages in detail.

Transaction Processing System (TPS)

7. Discuss pre-requisites of ACID Test for any Transaction Processing System.

Business Process Management Systems (BPMS)

8. XYZ Limited is planning to implement Business Process Management System (BPMS). The Management asked you to briefly explain some benefits of BPMS to help them to take a decision on BPMS.

Auditing in IT Environment

9. Discuss Audit Objectives in a computerized environment.

Flowcharts

10. Discuss advantages and limitations of using Flowchart.

Cloud Computing

11. Discuss Cloud Computing architecture.

Network Protocols

12. Discuss Network Protocols in detail.

Network Security Techniques

13. Discuss different tools/techniques to protect information and systems against compromise, intrusion, or misuse.

Business Intelligence Tools

14. Discuss various Business Intelligence Tools.

Supply Chain Management (SCM)

15. Discuss the components of Supply Chain Management.

SUGGESTED ANSWERS / HINTS

1. (i) **Mobile Software:** Mobile Software is the actual program that runs on the mobile hardware. It deals with the characteristics and requirements of mobile applications and is the engine of that mobile device. In other terms, it is the operating system of that appliance. It is the essential component that makes the mobile device operates.

   (ii) **Entity Relationship Diagram:** An Entity-Relationship (ER) diagram is a data modeling technique that creates a graphical representation of the entities, and the relationships between entities, within an information system. ER diagrams repeatedly bring into play symbols to symbolize dissimilar types of information.

   (iii) **Input Devices:** Input devices are devices through which we interact with the systems and include devices like Keyboard, Mouse and other pointing devices, Scanners & Bar Code, MICR readers, Webcams, Microphone and Stylus/Touch Screen. Keyboard helps us with text based input, Mouse helps us in position based input, Scanners & Webcams help in image based input and Microphone helps us in voice based input.

   (iv) **Network Access Control:** Network Access Control (NAC) products enforce security policy by granting only security policy–compliant devices access to network assets. They handle access authentication and authorization functions and can even control the data that specific users' access, based on their ability to recognize users, their devices and their network roles.

   (v) **Router:** Router is a communications processor that interconnects networks based on different rules or *protocols*, so that a telecommunications message can be routed to its destination.

   (vi) **Resilience:** It refers to the ability of a network to recover from any kind of error like connection failure, loss of data etc.

   (vii) **Information:** It is necessary for businesses to put in place procedures to ensure data which is a raw fact have been processed so that they are meaningful, known as Information. Some examples of information include aggregating which summarizes data by such means as taking an average value of a group of numbers. Sorting organizes data so that items are placed in a particular order, for example listing orders by delivery date etc.

   (viii) **Strategic-Level Systems:** These are the systems for strategic managers to track and deal with strategic issues, assisting in long-range planning. A principle area is tracking changes in the external conditions (market sector, employment levels, share prices, *etc.*) and matching these with the internal conditions of the organization.

   (ix) **Personal Identification Number:** The Personal Identification Number is similar to a password assigned to a user by an institution based on the user characteristics and encrypted using a cryptographic algorithm. The application generates a random

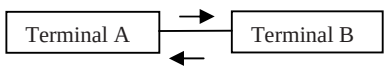
number stored in its database independent of user identification details or a customer selected number.

(x) **Validity in Controls:** This ensures that all recorded transactions fairly represent the economic events that actually occurred, are lawful in nature, and have been executed in accordance with management's general authorization.

2. (i) **Centralized Computing:** Centralized computing is computing done at a central location, using terminals that are attached to a central computer. The computer itself may control all the peripherals directly (if they are physically connected to the central computer), or they may be attached via a terminal server. It offers greater security over decentralized systems because all of the processing is controlled in a central location. In addition, if one terminal breaks down, the user can simply go to another terminal and log in again, and all of their files will still be accessible. Depending on the system, they may even be able to resume their session from the point they were at before, as if nothing had happened.

Decentralized Computing: Decentralized computing is the allocation of resources, both hardware and software, to each individual workstation, or office location. In contrast, centralized computing exists when the majority of functions are carried out, or obtained from a remote centralized location. A collection of decentralized computers systems are components of a larger computer network, held together by local stations of equal importance and capability. These systems are capable of running independently of each other. Decentralized systems enable file sharing and all computers can share peripherals such as printers and scanners as well as modems, allowing all the computers in the network to connect to the internet.

(ii) **Half-Duplex Mode:** In Half-Duplex mode, (sometimes called an alternating connection or semi-duplex) the data flows in one direction or the other, but not both at the same time. This type of connection makes it possible to have bidirectional communications using the full capacity of the line. For example: Walkie Talkie. In this, the entire capacity of a channel is taken over by whichever of the two devices is transmitting at the time.



Full-Duplex Mode: In Full-Duplex mode, the data flow in both directions simultaneously. Each end of the line can thus transmit and receive at the same time, which means that the bandwidth is divided in two for each direction of data transmission if the same transmission medium is used for both directions of transmission. For example: Mobile Phones. In this, signals going in either direction share the capacity of the link wither by containing two separate physical links (one for sending and the other for receiving) or by dividing the capacity of the channel between signals travelling in opposite direction.

(iii) **Circuit Switching:** A **Circuit Switching** network is one that establishes a fixed bandwidth circuit (or channel) between nodes and terminals before the users may communicate, as if the nodes were physically connected with an electrical circuit. The route is dedicated and exclusive, and released only when the communication session terminates. Circuit switching is what most of us encounter on our home phones. A single circuit is used for the entire duration of the call. Applications which use circuit switching go through three phases: **Establish a Circuit, Transfer of data** and **Disconnect the Circuit**.

Packet Switching: It is a sophisticated means of maximizing transmission capacity of networks. **Packet switching** refers to protocols in which messages are broken up into small transmission units called packets, before they are sent. Each packet is transmitted individually across the net. The packets may even follow different routes to the destination. Since there is no fixed path, different packets can follow different path and thus they may reach to destination out of order.

(iv) **Concurrent Audit:** In this, Auditors are members of the system development team. They assist the team in improving the quality of systems development for the specific system they are building and implementing.

General Audit: In this, Auditors evaluate systems development controls overall. They seek to determine whether they can reduce the extent of substantive testing needed to form an audit opinion about management's assertions relating to the financial statements in systems effectiveness and efficiency.

(v) **Quality Assurance Management Controls:** Organizations are increasingly producing safety-critical systems and users are becoming more demanding in terms of the quality of the software they employ to undertake their work. Organizations are undertaking more ambitious information systems projects that require more stringent quality requirements and are becoming more concerned about their liabilities if they produce and sell defective software.

Security Management Controls: Information security administrators are responsible for ensuring that information systems assets are secure. Assets are secure when the expected losses that will occur over some time are at an acceptable level.

(vi) **Presentation Layer or Layer 6 of OSI Model:** This layer at times referred as **Syntax Layer** also, is usually a part of an operating system, that converts incoming and outgoing data from one presentation format to another (for example, from a text stream into a popup window with the newly arrived text). The presentation service data units are then encapsulated into Session Protocol Data Units, and moved down the stack. It further controls on screen display of data, transforms data to a standard application interface. Encryption, data compression can also be undertaken at this layer level.

Session Layer or Layer 5 of OSI Model: This layer sets up, coordinates, and terminates conversations, exchanges, and dialogs between the applications at each end. It deals with session and connection coordination. It provides for full-duplex, half-duplex, or simplex operation, and establishes check pointing, adjournment, termination, and restart procedures. The OSI model made this layer responsible for "graceful close" of sessions also.

(vii) **Infrastructure as a Service (IaaS):** Infrastructure as a Service (IaaS) delivers computer infrastructure on an outsourced basis to support enterprise operations. Typically, IaaS provides hardware, storage, servers and data centre space or network components; it may also include software.

Software as a Service (SaaS): Software as a Service (SaaS) features a complete application offered as a service on-demand. A service provider hosts the application at its data centre over the Internet and customer accesses it via a standard Web browser. For example - Google Apps.

(viii) **Batch Processing:** It is defined as a processing of large set of data in a specific way, automatically, without needing any user intervention. The data is first collected, during a work day, for example, and then batch-processed, so all the collected data is processed in one go. This could happen at the end of the work day, for example, when computing capacities are not needed for other tasks. It is possible to perform repetitive tasks on a large number of pieces of data rapidly without needing the user to monitor it. Batched jobs can take a long time to process. Batch processing is used in producing bills, stock control, producing monthly credit card statements, etc.

Online Processing: Data is processed immediately while it is entered, the user usually only has to wait a short time for a response. (Example: games, word processing, booking systems). Interactive or online processing requires a user to supply an input. Interactive or online processing enables the user to input data and get the results of the processing of that data immediately.

(ix) The differences between Random Access Memory (RAM) and Read Only Memory (ROM) are given below:

Random Access Memory (RAM)	Read Only Memory (ROM)
RAM is a volatile memory and when the computer is turned off, RAM loses its data. When the computer is turned on again, operating system and other files are once again loaded into RAM usually from the hard disk.	Unlike RAM, ROM is non-volatile. The contents of ROM remain even after the computer is switched off.
This is Read Write memory wherein information can be read as well as modified.	Originally, the ROM used to be read-only; however, the new

	versions of ROM allow limited rewriting making it possible to upgrade firmware such as the BIOS by using installation software.

(x) **Plaintext -** It is the message that is to be encrypted. It is transformed by a function that is parameterized by a key.

CipherText - It is the output of the encryption process that is transmitted often by a messenger or radio.

3. (i) **Business Process Reengineering (BPR): Business Process Reengineering (BPR)** is based on the understanding that the products and services a company offers to the market are provided through business processes, and a radical redesign of these processes is the road to success. BPR is defined as the "fundamental rethinking and radical redesign of processes to achieve dramatic improvement, in critical, contemporary measures of performance such as cost, quality, service and speed". BPR is the main method by which organizations become more efficient and modern. It transforms an organization in ways that directly affect its performance.

(ii) **One-to-Many Relationship (1:N) in E-R Diagram –** A One-to-Many relationship is shown on the diagram by a line connecting the two entities with a "crow's foot" symbol denoting the 'many' end of the relationship.

Example: A student may borrow some books from the library. A book in the library may be borrowed by at most a student.

A class is formed by a group of atleast one student. Each student is allocated to one and only one class.

(iii) **System Designing Phase in SDLC:** This phase in SDLC examines that 'How will the Information System do what it must do to obtain the solution to the problem'? This phase specifies the technical aspects of a proposed system in terms of Hardware platform; Software; Outputs; Inputs; User interface; Modular design; Test plan; Conversion plan and Documentation.

(iv) **Electronic Funds Transfer (EFT):** Electronic Funds Transfer (EFT) represents the way the business can receive direct deposit of all payments from the financial institution to the company bank account. Once the user "Signs Up", money comes

to him directly and sooner than ever before. Some examples of EFT systems in operation are Automated Teller Machines (ATMs), Point-of-Sale (PoS) Transactions, Preauthorized and Telephone Transfers.

(v) **Repeater:** Repeater is a communication processor that boosts or amplifies the signal before passing it to the next section of cable in a network.

(vi) **Leased Application:** It is a new method for getting applications that are being used today, i.e. leased applications, where user pays fixed rent for using the application for agreed terms. Many specialized vendors provide users with option to get their job done by paying monthly rent; this is referred to as outsourcing.

(vii) **Quality Assurance Management under Managerial Controls:** It is responsible for ensuring information systems development; implementation, operation, and maintenance conform to established quality standards.

(viii) **Smart Cards:** Smart cards are any pocket sized card with embedded integrated circuits. Smart cards can provide identification authentications, data storage and application processing. Smart cards may serve as a credit or ATM cards, Fuel cards, mobile phone SIMs, access-control cards, public transport or public phone payment cards etc. on the card. Contact cards, Contactless cards and Combi/Hybrid Cards are the three types of Smart Cards.

(ix) **Inference Engine in Expert Systems:** This program contains the logic and reasoning mechanisms that simulate the expert logic process and deliver advice. It uses data obtained from both the knowledge base and the user to make associations and inferences, form its conclusions, and recommend a course of action.

(x) **Operating System:** An Operating System (OS) is a set of computer programs that manages computer hardware resources and acts as an interface with computer applications programs. The operating system is a vital component of the system software in a computer system. Application programs usually require an operating system to function that provides a convenient environment to users for executing their programs. Computer hardware with operating system can thus be viewed as an extended machine which is more powerful and easy to use. Some prominent Operating systems used nowadays are Windows 7, Windows 8, Linux, UNIX, etc.

4. The Data Processing Cycle consists of following basic steps with alerts, controls and feedback at each step:

- **Data input** - Involves the activities like capturing the data, implementing control procedures, recording in journals, posting to ledgers and preparation of reports.
- **Data storage** - Involves organizing the data in master file or reference file of an automated system for easy and efficient access.

- **Data processing** - Involves addition, deletion and updating of the data in the transaction file, master file or reference file.
- **Information output** - Involves generation of documents and managerial reports in printable or electronic form for addressing queries, to control operational activities and help the management in decision making.

5. Major applications of the concepts of the Virtualization are given as follows:
   - **Server Consolidation:** Virtual machines are used to consolidate many physical servers into fewer servers, which in turn host virtual machines. Each physical server is reflected as a virtual machine "guest" residing on a virtual machine host system. This is also known as “Physical-to-Virtual” or 'P2V' transformation.
   - **Disaster Recovery:** Virtual machines can be used as "hot standby" environments for physical production servers. This changes the classical "backup-and-restore" philosophy, by providing backup images that can "boot" into live virtual machines, capable of taking over workload for a production server experiencing an outage.
   - **Testing and Training:** Hardware virtualization can give root access to a virtual machine. This can be very useful such as in kernel development and operating system courses.
   - **Portable Applications:** Portable applications are needed when running an application from a removable drive, without installing it on the system's main disk drive. Virtualization can be used to encapsulate the application with a redirection layer that stores temporary files, windows registry entries and other state information in the application's installation directory and not within the system's permanent file system.
   - **Portable Workspaces:** Recent technologies have used virtualization to create portable workspaces on devices like iPods and USB memory sticks.
6. **Ring Network:** A Ring Network is much like a bus network, except the length of wire, cable, or optical fibre connects to form a loop. The characteristics of a ring network are:
   - Local computer processors are tied together sequentially in a ring with each device being connected to two other devices.
   - A ring network has a decentralized approach.
   - When one computer needs data from another computer, the data is passed along the ring.
   - Considered more reliable and less costly than star networks because if one computer fails, the other computers in the ring can continue to process their own work and communicate with each other.

Advantages of Ring Network include the following:

- Ring networks do not require a central computer to control activity nor does it need a file server.
- Each computer connected to the network can communicate directly with the other computers in the network by using the common communication channel, and each computer does its own independent applications processing.
- The ring network is not as susceptible to breakdowns as the star network, because when one computer in the ring fails, it does not necessarily affect the processing or communications capabilities of the other computers in the ring.
- Ring networks offer high performance for a small number of workstations or for larger networks where each station has a similar workload.
- Ring networks can span longer distances than other types of networks.
- Ring networks are easily extendable.

Disadvantages of Ring Network are as follows:

- Relatively expensive and difficult to install.
- Failure of one computer on the network can affect the whole network.
- It is difficult to troubleshoot a ring network.
- Adding or removing computers can disrupt the network.

Mesh Network: In this structure, there is random connection of nodes using communication links. A mesh network may be fully connected or connected with only partial links. In fully interconnected topology, each node is connected by a dedicated point to point link to every node. The reliability is very high as there are always alternate paths available if direct link between two nodes is down or dysfunctional. Fully connected networks are not very common because of the high cost. Only military installations, which need high degree of redundancy, may have such networks, that too with a small number of nodes.

Advantages of Mesh Network are as under:

- Yields the greatest amount of redundancy in the event that if one of the nodes fails, the network traffic can be redirected to another node.
- Network problems are easier to diagnose.

Disadvantage of Mesh Network is its high cost of installation and maintenance (more cable is required than any other configuration).

7. In order to qualify as a Transaction Processing System (TPS), transactions made by the system must pass the ACID Test. The ACID Test refers to the following four prerequisites as discussed below:

- **Atomicity:** This means that a transaction is either completed in full or not at all. TPS systems ensure that transactions take place in their entirety. For example, if funds are transferred from one account to another, this only counts as a bona-fide transaction if both the withdrawal and deposit take place. If one account is debited and the other is not credited, it does not qualify as a transaction.
- **Consistency:** TPS systems exist within a set of operating rules (or integrity constraints). If an integrity constraint states that all transactions in a database must have a positive value, any transaction with a negative value would be refused.
- **Isolation:** Transactions must appear to take place in seclusion. For example, when a fund transfer is made between two accounts the debiting of one and the crediting of another must appear to take place simultaneously. The funds cannot be credited to an account before they are debited from another.
- **Durability:** Once transactions are completed they cannot be undone. To ensure that this is the case even if the TPS suffers failure, a log will be created to document all completed transactions.

These four conditions ensure that TPS systems carry out their transactions in a methodical, standardized and reliable manner. So Transactions must be ongoing.

8. Some benefits of Business Process Management Systems (BPMS) are as follows:

(a) **Automating repetitive business processes:** Processes such as report creation and distribution or the monitoring of or reporting on company's Key Performance Indicators (KPI) reduces the manual operational costs and helps employees to concentrate on activities that are important to the success of business.

(b) **BPMS works by 'loosely coupling' with a company's existing applications:** This enables it to monitor, extract, format and distribute information to systems and people; in line with business events or rules.

(c) **Operational Savings:** BPM focuses on optimization of processes. The processes that are repetitive are optimized and lead to reduced expenses which translate to immediate cost savings. By automating a task, ROI of BPM that requires six hours of manual intervention, one can expect to cut that time to half. Thus, three hours multiplied by the number of times the process is completed in a cycle will yield significant cost saving.

(d) **Reduction in the administration involved in Compliance and ISO Activities:** Be it a quality assurance initiative such as the ISO standards, a financial audit law, or an IT systems best-practice implementation, companies worldwide are seeing the need to manage compliance as part of their everyday business activities. The BPM is ideally suited to help support companies in their quest for process improvement and compliance/governance certification. It gives full control over process and document change, clarity of inherent risks, and ease with which process knowledge is communicated across the company.

(e) **Freeing-up of employee time:** While the euphuism "time is money" is often over-used, it is very relevant to this topic, because in business, for each additional hour it takes to complete a manual business process, there is a hard cost associated with employee time as well as soft costs associated with losing business or lowered productivity. Another area where time comes into play is in opportunity costs.

9. The general objectives of auditing in a computerized environment are as follows:

- **Existence:** Verify that the assets, liabilities, ownership, and/or activities are real;
- **Authorization:** Verify that events have occurred in accordance with management`s intent;
- **Valuation:** Verify that the accounting values fairly present items worth;
- **Cutoff:** Verify that the transaction is re-coded in the proper accounting period;
- **Compliance:** Verify that the processing is in compliance with governmental laws and regulations, generally accepted accounting procedures, and the organization`s policies and procedures;
- **Operational:** Verify that the program, area, or activity is performed economically, efficient, and effectively;
- Assisting management in finding ways to implementing internal control recommendations;
- Participating in specifying and designing computer control and other features for systems to be installed;
- Determining whether efficient use is made of the organization's Computer resources; and
- Determining whether Computer system used accomplishes the business objectives and goals.

10. Advantages of using Flowchart are as follows:

(i) **Quicker grasp of relationships** – Before any application can be solved, it must be understood, the relationship between various elements of the application must be identified. The programmer can chart a lengthy procedure more easily with the help of a flowchart than by describing it by means of written notes.

(ii) **Effective Analysis** – The flowchart becomes a blue print of a system that can be broken down into detailed parts for study. Problems may be identified and new approaches may be suggested by flowcharts.

(iii) **Communication** – Flowcharts aid in communicating the facts of a business problem to those whose skills are needed for arriving at the solution.

(iv) **Documentation** – Flowcharts serve as a good documentation which aid greatly in future program conversions. In the event of staff changes, they serve as training function by helping new employees in understanding the existing programs.

(v) **Efficient coding** – Flowcharts act as a guide during the system analysis and program preparation phase. Instructions coded in a programming language may be checked against the flowchart to ensure that no steps are omitted.

(vi) **Orderly check out of problem** – Flowcharts serve as an important tool during program debugging. They help in detecting, locating and removing mistakes.

(vii) **Efficient program maintenance** – The maintenance of operating programs is facilitated by flowcharts. The charts help the programmer to concentrate attention on that part of the information flow which is to be modified.

Limitations of using Flowchart are as follows:

(i) **Complex logic** – Flowchart becomes complex and clumsy where the problem logic is complex. The essentials of what is done can easily be lost in the technical details of how it is done.

(ii) **Modification** – If modifications to a flowchart are required, it may require complete re-drawing.

(iii) **Reproduction** – Reproduction of flowcharts is often a problem because the symbols used in flowcharts cannot be typed.

(iv) **Link between conditions and actions** – Sometimes it becomes difficult to establish the linkage between various conditions and the actions to be taken there upon for a particular condition.

(v) **Standardization** – Program flowcharts, although easy to follow, are not such a natural way of expressing procedures as writing in English, nor are they easily translated into Programming language.

11. **Cloud Computing Architecture: Cloud Computing Architecture** refers to the components and subcomponents that typically consist of a front end platform (fat client, thin client, mobile device), back end platforms (servers, storage), a cloud based delivery, and a network (Internet, Intranet, Intercloud). Combined, these components make up cloud computing architecture. Cloud architecture typically involves multiple cloud components communicating with each other over a tight or loose coupling of cloud resources, services, middleware, and software components.

A cloud computing architecture consists of two parts - **Front End** and a **Back End** that connect to each other through a network, usually the Internet. The front end is the side the computer user, or client, sees. The back end is the "cloud" section of the system.

- **Front End:** The **Front End** of the cloud computing system comprises of the client's devices (or it may be a computer network) and some applications are needed for

accessing the cloud computing system. All the cloud computing systems do not give the same interface to users. For example-Web services like electronic mail programs use some existing web browsers such as Firefox, Microsoft's internet explorer or Apple's Safari. Other types of systems have some unique applications which provide network access to its clients.

- **Back End:** Back End refers to some physical peripherals. In cloud computing, the back end is cloud itself which may encompass various computer machines, data storage systems and servers. Groups of these clouds make a whole cloud computing system. Theoretically, a cloud computing system can include practically any type of web application program such as video games to applications for data processing, software development and entertainment residing on its individual dedicated server for services. There are some set of rules, generally called as **Protocols** which are followed by this server and it uses a special type of software known termed as **Middleware** that allow computers that are connected on networks to communicate with each other. If any cloud computing service provider has many customers, then there's likely to be very high demand for huge storage space. Many companies that are service providers need hundreds of storage devices.

12. **Network Protocols:** Protocols are software that performs a variety of actions necessary for data transmission between computers. Stated more precisely, protocols are a set of rules for inter-computer communication that have been agreed upon and implemented by many vendors, users and standards bodies to ensure that the information being exchanged between the two parties is received and interpreted correctly. Ideally, a protocol standard allows heterogeneous computers to talk to each other.

    At the most basic level, protocols define the physical aspects of communication, such as how the system components will be interfaced and at what voltage levels will be transmitted.

    At higher levels, protocols define the way that data will be transferred, such as the establishment and termination of "sessions" between computers and the synchronization of those transmissions. At still higher levels, protocols can standardize the way data itself is encoded and compressed for transmission.

    A protocol defines the following three aspects of digital communication.

    (a) **Syntax:** The format of data being exchanged, character set used, type of error correction used, type of encoding scheme (e.g., signal levels) being used.

    (b) **Semantics:** Type and order of messages used to ensure reliable and error free information transfer.

    (c) **Timing:** Defines data rate selection and correct timing for various events during data transfer.

At the sending computer, protocols –

(i) Break data down into packets;

(ii) Add destination address to the packet; and

(iii) Prepares data for transmission through Network Interface Card (NIC)

At the receiving computer, protocols –

(i) Take data packets off the cable;

(ii) Bring packets into computer through Network Interface Card (NIC;

(iii) Strip the packets off any transmitting information;

(iv) Copy data from packet to a buffer for reassembly; and

(v) Pass the reassembled data to the application.

13. Different tools/technologies are now available to protect information and systems against compromise, intrusion, or misuse. Some of them are as follows:

(i) Intrusion Detection System (IDS): An Intrusion Detection System is a device or software application that monitors network or system activities for malicious activities or policy violations and produces reports to a Management Station. The goal of intrusion detection is to monitor network assets to detect anomalous behaviour and misuse. Network Intrusion Detection System (NID) and Host-based Intrusion Detection (HID) Systems are two primary Intrusion Detection Systems.

(ii) Firewall: Firewall is a device that forms a barrier between a secure and an open environment when the latter environment is usually considered hostile, for example, the Internet. It acts as a system or combination of systems that enforces a boundary between more than one networks. Access controls are common form of controls encountered in the boundary subsystem by restricting the use of system resources to authorized users, limiting the actions authorized users can take with these resources and ensuring that the users obtain only authentic system resources.

(iii) Network Access Control: Network Access Control (NAC) products enforce security policy by granting only security policy–compliant devices access to network assets. They handle access authentication and authorization functions and can even control the data that specific users' access, based on their ability to recognize users, their devices and their network roles.

(iv) Anti – Malware: Anti-malware network tools help administrators identify block and remove malware. They enable the IT department to tailor its anti-malware policies to identify known and unknown malware sources. Malware is always on the lookout for network vulnerabilities - in security defences, operating systems, browsers, applications and popular targets such as Adobe Flash, Acrobat and Reader - that they can exploit to fully access a victim's network. Best practices call for a multipronged defence that might also include IP blacklisting, data loss prevention

(DLP) tools, anti-virus and anti-spyware software, web browsing policies, egress filtering, and outbound-traffic proxies.

(v) **Site Blocking:** It is a software-based approach that prohibits access to certain Web sites that are deemed inappropriate by management. For example, sites that contain explicit objectionable material can be blocked to prevent employee's from accessing these sites from company Internet servers. In addition to blocking sites, companies can also log activities and determine the amount of time spent on the Internet and identify the sites visited.

14. Business Intelligence tools are a type of software that is designed to retrieve, analyze and report data. BI is basically just getting important business information to decision makers when they need it – in a way that they can actually use it. Business Intelligence tools are standalone tools or suites of tools that are targeted to a specific industry that implement a particular BI technique.

Business Intelligence tools are software programs and features that are used to complete detailed data analysis. There are different types of business intelligence tools which a business may need in order to achieve business objectives. Some of the key Business Intelligence tools are given as follows:

- **Simple Reporting and Querying:** This involves using the data warehouse to get response to the query: "Tell me what happened." The objective of a BI implementation is to turn operational data into meaningful knowledge. This requires that BI must be connected with the enterprise data and all the necessary data is available in one place, in one common format. Data warehousing (DW) provides the perfect architecture to combine all the data dispersed throughout the enterprise in different applications in a variety of formats, on a range of hardware, which could be anywhere to be cleaned up, summarized, converted and integrated into one common format and available centrally for further processing. There are reporting tools used to arrange information into a readable format and distribute it to the people who need it.
- **Business Analysis:** This involves using the data to get response to the query: "Tell me what happened and why." Business analysis refers to presenting visualizing data in a multidimensional manner. Query and report data is presented in row after row of two dimensional data. Typically, the first dimension is the headings for the data columns and the second dimension is the actual data listed below those column headings. Business analysis allows the user to plot data in row and column coordinates to further understand the intersecting points. ETL (Extract, Transform, Load) tools bring in data from outside sources, transform it to meet business specified operational needs, and then load the results into the company database. Metadata tools gather and analyze metadata, helping to increase data quality.

- **Dashboards**: This involves using the information gathered from the data warehouse and making it available to users as snapshots of many different things with the objective of getting response to the query: "Tell me a lot of things, but without too much effort". Dashboards are flexible tools that can be bent into as many different shapes as per user requirements. It includes a collection of graphs, reports, and KPIs that can help monitor such business activities as progress on a specific initiative.
- **Scorecards:** This involves providing a visual representation of the enterprise strategy by taking critical metrics and mapping them to strategic goals throughout the enterprise. Scorecards offer a rich, visual gauge to display the performance of specific initiatives, business units, or the enterprise as a whole and the individual goals in the context of larger enterprise strategy. Scorecards distil information into a small number of metrics and targets and provide users with an at a glance perspective of information. A scorecard has a graphical list of specific, attainable strategic milestones, combined with metrics that serve as benchmarks. Specific measures on how well the company has actually performed specified activities are linked in the scorecard with graphical display highlighting the status of each goal.
- **Data Mining or Statistical Analysis:** This involves using statistical, artificial intelligence, and related techniques to mine through large volumes of data and providing knowledge without users even having to ask specific questions. The objective is to provide interesting and useful information to users by design even without their querying. Data Mining involves data analysis for discovering useful patterns that are "hidden" in large volume of diverse data. For Example: Market segmentation - identify common characteristics of customers who buy same products. OLAP (Online Analytical Processing) is a multi-dimensional analytical tool typically used in data mining, that gathers and process vast amounts of information into useful packets.

15. The main elements of a Supply Chain Management (SCM) are as follows:

(i) **Procurement/Purchasing** - begins with the purchasing of parts, components, or services. Procurement must ensure that the right items are delivered in the exact quantities at the correct location on the specified time schedule at minimal cost. This means that procurement must concern itself with the determination of who should supply the parts, the components, or the services. It must address the question of assurance that these suppliers will deliver as promised. The key issue in procurement is how one goes about selecting and maintaining a supplier, which can be approached from two directions. The first concentrates on how a firm might evaluate a potential supplier whereas the second is how a firm evaluates those businesses that are already suppliers to an operation.

(ii) **Operations** - The second major element of supply chain management system is operations. Having received raw materials, parts, components, assemblies, or services from suppliers, the firm must transform them and produce the products or the services that meet the needs of its consumers. It must conduct this transformation in an efficient and effective manner for the benefit of the supply chain management system.

(iii) **Distribution** - The third element of the supply chain management system is distribution. Distribution involves several activities—transportation (logistics), warehousing, and customer relationship management (CRM). The first and most obvious is logistics—the transportation of goods across the entire supply chain.

(iv) **Integration** - The last element of supply chain management is the need for integration. It is critical that all participants in the service chain recognize the entirety of the service chain. The impact of the failure to adopt a system-wide perspective—that is, examining the totality of the chain can significantly increase costs and destroy value.

SECTION – B: STRATEGIC MANAGEMENT

Correct/Incorrect with reasoning

1. State with reasons which of the following statements are correct/incorrect:
   (a) Portfolio analysis involves comparison of various functional areas of business.
   (b) Strategic management is a bundle of tricks and magic.
   (c) A strategic group consists of rival firms with similar competitive approaches and positions in the market.
   (d) SWOT analysis presents a comparative account.
   (e) Focus strategies are most effective with consumers having similar preferences.
   (f) TQM is a people-focused management system that aims employees' satisfaction.
   (g) IT can bring efficiency and effectiveness in the functioning of businesses.
   (h) A corporate culture is always identical in organizations located in same geographical area.
   (i) Demarketing is used to eliminate the competitors' market share.
   (j) Balance scorecard is a combination of Human resource and marketing functions.

Differences between the two concepts

2. Distinguish between the following:
   (a) Economic environment and Socio-cultural environment.
   (b) Synchro Marketing and Demarketing.
   (c) Divestment strategy and Liquidation strategy.
   (d) Logistic Management and Supply Chain Management.

Short notes

3. Write short notes on the following:
   (a) Implementation steps in BPR.
   (b) Reasons necessary for globalization of companies.
   (c) Objectives of SWOT analysis.
   (d) Retrenchment Strategy.

Brief answers

4. Briefly answer the following questions:
   (a) Briefly explain Experience Curve.

(b) Define Competitive Advantage.

(c) Explain Strategic Vision.

(d) Define Network structure.

Descriptive Answers

Chapter 1-Business Environment

5. "A business enterprise is a sub-system of the larger environmental system." Discuss the relationship between the organization and its business environment.

6. Explain briefly different strategic approaches for Globalization by a company.

Chapter 2-Business Policy and Strategic Management

7. Distinguish between the Three Levels of Strategy Formulation.

8. What is Strategic Decision Making? Briefly explain the major dimensions of strategic decisions.

Chapter 3-Strategic Analysis

9. ABC Ltd., the pharmaceutical company wants to grow its business. Draw Ansoff's Product Market Growth Matrix to advise them of the available options.

10. How would you argue that strategic analysis is the starting point for strategic thinking?

Chapter 4-Strategic Planning

11. What do you understand by 'Strategy'? Explain the four generic strategies as discussed by Glueck and Jauch.

12. Many organizations in order to achieve quick growth use strategies such as mergers and acquisitions. Explain. Discuss various types of mergers.

Chapter 5-Formulation of Functional Strategy

13. What are the issues that need to be addressed to formulate an effective logistics strategy in a business firm?

14. How Research and Development (R&D) personnel can play an integral part in strategy implementation?

Chapter 6-Strategic Implementation and Control

15. "Successful strategy formulation does not guarantee successful strategy implementation." Discuss.

16. How is 'Strategic Business Unit' beneficial for improving the competitive advantage of a firm?

Chapter 7-Reaching Strategic Edge

17 Explain the role of strategic management in Medical Organizations.

18. How would you explain the managerial significance of Six Sigma in today's business world?

SUGGESTED ANSWERS

1. **(a)** **Incorrect:** Portfolio analysis can be defined as a set of techniques that help strategists in taking strategic decisions with regard to individual products or businesses in a firm's portfolio. It is primarily used for competitive analysis and corporate strategic planning in a multiproduct and multi-business firm.

(b) **Incorrect:** No, Strategic management is not a bundle of tricks and magic. It is much more serious affair. It involves systematic and analytical thinking and action. Although, the success or failure of a strategy is dependent on several extraneous factors, it can not be stated that a strategy is a trick or magic. Formation of strategy requires careful planning and requires strong conceptual, analytical, and visionary skills.

(c) **Correct:** A strategic group consists of those rival firms that have similar competitive approaches and positions in the market. Organisations in the same strategic group can resemble one another in any of the several ways: they may have comparable product-line breadth, sell in the same price/quality range, emphasize the same distribution channels, use essentially the same product attributes to appeal to similar types of buyers, depend on identical technological approaches, or offer buyers similar services and technical assistance.

(d) **Correct:** SWOT analysis presents the information about both external and internal environment in a structured form where it is possible to compare external opportunities and threats with internal strengths and weaknesses. This helps in matching external and internal environments so that a strategist can come out with suitable strategy by developing certain patterns of relationship. The patterns are combinations say, high opportunities and high strengths, high opportunities and low strengths, high threats and high strengths, high threats and low strengths.

(e) **Incorrect:** Focus strategies are most effective when consumers have distinctive preferences or requirements and when rival firms are not attempting to specialize in the same target segment. An organization using a focus strategy may concentrate on a particular group of customers, geographic markets, or on particular product-line segments in order to serve a well-defined but narrow market better than competitors who serve a broader market.

(f) **Incorrect:** TQM or Total Quality Management is a people-focused management system that aims at continual increase in customer satisfaction at continually lower real cost. There is a sustained management commitment to quality and everyone in the organisation and the supply chain is responsible for preventing rather than detecting defects.

(g) **Correct:** Information technology is playing a significant role in changing the business processes. A reengineered business process, characterized by IT-assisted speed, accuracy, adaptability and integration of data and service points, is focused on meeting the customer needs and expectations quickly and adequately, thereby enhancing his/her satisfaction level. With the help of tools of information technology organizations can modify their processes to make them automatic, simpler, time saving. Thus IT can bring efficiency and effectiveness in the functioning of business.

(h) **Incorrect:** Every company has its own organisational culture. Each has its own business philosophy and principles, its own ways of approaching to the problems and making decisions, its own work climate, work ethics, etc. Therefore, corporate culture need not be identical in all organisations in a geographical area. However, every organisation over a period of time inherits and percolates down its own specific work ethos and approaches.

(i) **Incorrect:** Demarketing is a marketing strategy to reduce demand temporarily or permanently-the aim is not to destroy demand, but only to reduce or shift it. This happens when the demand is too much to handle. For example, buses are overloaded in the morning and evening, roads are busy for most of times, zoological parks are over-crowded on Saturdays, Sundays and holidays. Here demarketing can be applied to regulate demand.

(j) **Incorrect**: Balance scorecard is a combination of strategic and financial objectives. It measure company performance, requires setting both financial and strategic objectives and tracking their achievement. Unless a company is in deep financial difficulty, such that its very survival is threatened, company managers are well advised to put more emphasis on achieving strategic objectives than on achieving financial objectives whenever a trade-off has to be made.

2. (a) The economic environment refers to the nature and direction of the economy in which a company competes or may compete. It includes general economic situation in the region and the nation, conditions in resource markets which influence the supply of inputs to the enterprise, their costs, quality, availability and reliability of supplies.

Economic environment determines the strength and size of the market. The purchasing power in an economy depends on current income, prices, savings, circulation of money, debt and credit availability. Income distribution pattern determines the marketing possibilities. The important point to consider is to find out the effect of economic prospect and inflation on the operations of the firms. Strategists must scan, monitor, forecast, and assess a number of key economic factors for both domestic and key international markets.

Socio-Cultural Environment influences almost all enterprises in a similar manner. It primarily affects strategic management process within the organization in the areas of mission & objectives setting and decisions related to products & markets.

Socio-cultural environment is a complex combination of factors such as social traditions, values and beliefs, changing lifestyle patterns &materialism, level and standards of literacy and education, awareness & consciousness of rights and work ethics of members of society, the ethical standards and state of society, the extent of social stratification, conflict and cohesiveness, social concerns such as corruption, environmental pollution etc.

(b) **Synchro-marketing:** When the demand for any product is irregular due to season, some parts of the day, or on hour basis, causing idle capacity or overworked capacities, synchro-marketing can be used to find ways to alter the same pattern of demand through flexible pricing, promotion, and other incentives. For example, products such as movie tickets can be sold at lower price over week days to generate demand.

Demarketing: Marketing strategies to reduce demand temporarily or permanently- the aim is not to destroy demand, but only to reduce or shift it. This happens when there is overfull demand. For example, buses are overloaded in the morning and evening, roads are busy for most of times, zoological parks are over-crowded on Saturdays, Sundays and holidays. Here demarketing can be applied to regulate demand.

(c) **Divestment Strategy:** Divestment strategy involves the sale or liquidation of a portion of business, or a major division, profit centre or SBU. Divestment is usually a part of rehabilitation or restructuring plan and is adopted when a turnaround has been attempted but has proved to be unsuccessful. The option of a turnaround may even be ignored if it is obvious that divestment is the only answer.

Liquidation Strategy: Liquidation as a form of retrenchment strategy is considered as the most extreme and unattractive. It involves closing down a firm and selling its assets. It is considered as the last resort because it leads to serious consequences such as loss of employment for workers and other employees, termination of opportunities a firm could pursue, and the stigma of failure.

(d) Supply chain management is an extension of logistic management. However, there are differences between the two. Logistical activities typically include management of inbound and outbound goods, transportation, warehousing, handling of material, fulfillment of orders, inventory management and supply/demand planning. Although these activities also form part of supply chain management, the latter is much broader. Logistic management can be termed as one of its part that is related to planning, implementing, and controlling the movement and storage of goods, services and related information between the point of origin and the point of consumption.

Supply chain management is an integrating function of all the major business activities and business processes within and across organisations. Supply Chain Management is a systems view of the linkages in the chain consisting of different channel partners – suppliers, intermediaries, third-party service providers and customers. Different elements in the chain work together in a collaborative and coordinated manner. Often it is used as a tool of business transformation and involves delivering the right product at the right time to the right place and at the right price.

3. **(a)** Companies begin business process re-engineering by creating a plan of action based on the gap between the current and proposed processes, technologies and structures. Steps usually followed to implement BPR are as follows:

(i) **Determining objectives and framework:** Objectives are the desired end results of the redesign process which the management and organization attempts to achieve. It helps in building a comprehensive foundation for the reengineering process.

(ii) **Identify customers and determine their needs***:* The designers have to understand customers – their profile, their steps in acquiring, using and disposing a product. The purpose is to redesign business process that clearly provides added value to the customer.

(iii) **Study the existing process:** The existing processes will provide an important base for the redesigners.

(iv) **Formulate a redesign process plan:** Formulation of redesign plan is the real crux of the reengineering efforts. Customer focused redesign concepts are identified and formulated.

(v) **Implement the redesign:** Implementation of the redesigned process and application of other knowledge gained from the previous steps is key to achieve dramatic improvements.

(b) Reasons necessary for Globalization of companies are as follows:

- The rapid shrinking of time and distance across the globe resulting in faster communication, speedier transportation, growing financial flows and rapid technological changes.
- Domestic market is not large enough to absorb whatever is produced. Some European companies have gone global for this reason.
- Justification of foreign investment keeping in view the size of foreign market.
- Securing a reliable and cheaper source of raw-materials. Some companies, by contrast, have often ventured overseas to protect old markets or to seek new ones. For example cheap labour in India lure foreign investors.

- Reducing the high transportation costs by setting up overseas plants that ultimately leads to reducing the higher ratio of the unit cost to the selling price per unit.

(c) In SWOT analysis 'strengths' and 'opportunities' are positive considerations and 'weaknesses' and 'threats' are negative considerations. The basic objectives of conducting SWOT analysis are:

- To exploit the strengths of the company to achieve its objectives.
- To identify the shortcomings in the company's present skills and resources and to take necessary corrective steps so that the overall interest of the organisation is protected.
- To focus on profit making opportunities in the business environment and for identifying threats.
- To highlight areas within the company, which are strong and might be exploited more and weaknesses, where some defensive planning might be required to prevent the company from downfall.

(d) Retrenchment strategy implies substantial reduction in the scope of organization's activity. A business organization can redefine its business by divesting a major product line or market. While retrenching, organizations might set objectives below the past level of objectives. It is essentially a defensive strategy adopted as a reaction to operating problems stemming from either internal mismanagement, unanticipated actions by competitors or hostile and unfavourable changes in the business environmental conditions. With a retrenchment strategy the endeavour of management is to raise the level of enterprise achievements focusing on improvements in the functional performance and cutting down operations with negative cash flows.

4. (a) Experience curve is similar to learning curve which explains the efficiency gained by workers through repetitive productive work. Experience curve is based on the commonly observed phenomenon that unit costs decline as a firm accumulates experience in terms of a cumulative volume of production. The implication is that larger firms in an industry would tend to have lower unit costs as compared to those of smaller organizations, thereby gaining a competitive cost advantage. Experience curve results from a variety of factors such as learning effects, economies of scale, product redesign and technological improvements in production.

The concept of experience curve is relevant for a number of areas in strategic management. For instance, experience curve is considered a barrier for new firms contemplating entry in an industry. It is also used to build market share and discourage competition.

(b) Competitive advantage is the position of a firm to maintain and sustain a favorable market position when compared to the competitors. Competitive advantage is ability

to offer buyers something different and thereby providing more value for the money. It is the result of a successful strategy. This position gets translated into higher market share, higher profits when compared to those that are obtained by competitors operating in the same industry. Competitive advantage may also be in the form of low cost relationship in the industry or being unique in the industry along dimensions that are widely valued by the customers in particular and the society at large.

(c) A strategic vision delineates organisation's aspirations for the business, providing a panoramic view of the position where the organisation is going. A strategic vision points an organization in a particular direction, charts a strategic path for it to follow in preparing for the future, and moulds organizational identity. A Strategic vision is a road map of a company's future – providing specifics about technology and customer focus, the geographic and product markets to be pursued, the capabilities it plans to develop, and the kind of company that management is trying to create.

(d) Network structure is a newer and somewhat more radical organizational design. The network structure could be termed as 'non-structure' as it virtually eliminates in-house business functions and outsource many of them. A corporation organized in this manner is a virtual organization because it is composed of a series of project groups or collaborations linked by constantly changing non-hierarchical, cobweb-like networks.

5. A business does not function in isolation, rather, it acts as a sub-system of its environment consisting of society, economy, laws, competitors and so on. Business draws certain inputs from environment in the form of resources and information and transforms them into outputs. The relationship between the organization and its environment may be discussed in terms of interactions between them that can be broadly outlined as below:

Exchange of information: The organization scans the external environmental variables, their behaviour and changes, generates important information and uses it for its planning, decision-making and control purposes.

On the other hand, the organization itself transmits information to several external agencies either voluntarily, inadvertently or legally.

Exchange of resources: The organization receives inputs — finance, materials, manpower, equipment etc., from the external environment. It sustains itself by employing the above inputs for involving or producing output of products and services.

The organization is also dependent on the external environment for disposal of its output of products and services to a wide range of clientele.

Exchange of influence and power: The external environment holds considerable power over the organization both by virtue of its being more inclusive as also by virtue of its command over resources, information and other inputs. The external environment is also in a position to

impose its will over the organization. Governmental control, competitors, customers, suppliers, investors etc., exercise considerable power and influence over the organization.

In turn, the organization itself is sometimes in a position to wield power and influence over the external environment by virtue of its command over resources and information.

6. International economic dynamics accompanied by geographical changes have changed the paradigm of global business. A firm / company who wishes to go global will be guided by the following three types of strategies:

(i) **Multi-domestic strategy:** A multi-domestic strategy focuses on competition within each country in which the firm operates. This Strategy is adopted when a company tries to achieve a high level of local responsiveness by matching their products and services offerings to national conditions prevailing in the countries they operate in. The organization attempts to extensively customize their products and services according to the local conditions of different countries.

(ii) **Global strategy:** A global strategy assumes more standardization of products across country boundaries. Under this strategy, the company tries to focus on a low cost structure by leveraging their expertise in providing certain products and services and concentrating the production of these standard products and services at a few favourable locations around the world. Competitive strategy is centralized and controlled by the home office.

(iii) **Transnational strategy:** Many large multinational firms, particularly those with many diverse products, may use a multi-domestic strategy with some product lines and a global strategy with others. A transnational strategy seeks to combine aspects of both multi-domestic and global strategies. Thus there is emphasizes on both local responsiveness and global integration and coordination. Although the transnational strategy is difficult to implement, environmental trends are causing multinational firms to consider the needs for both global efficiencies and local responsiveness.

When a firm adopts one or more of the above strategies, the firm would have to take decisions on the manner in which it would commence international operations. The decision as to how to enter a foreign market can have a significant impact on the results. Expansion into foreign markets can be achieved through following options:

- Exporting.
- Licensing/ Franchising.
- Joint Venture.
- Foreign Direct Investment.

7. A typical large organization is a multidivisional organisation that competes in several different businesses. It has separate self-contained divisions to manage each of these. There are three levels of strategy in management of business - corporate, business, and functional.

The corporate level of management consists of the chief executive officer and other top level executives. These individuals occupy the apex of decision making within the organization. The role of corporate-level managers is to oversee the development of strategies for the whole organization. This role includes defining the mission and goals of the organization, determining what businesses it should be in, allocating resources among the different businesses and so on rests at the Corporate Level.

The development of strategies for individual business areas is the responsibility of the general managers in these different businesses or business level managers. A business unit is a self-contained division with its own functions - for example, finance, production, and marketing. The strategic role of business-level manager, head of the division, is to translate the general statements of direction and intent that come from the corporate level into concrete strategies for individual businesses.

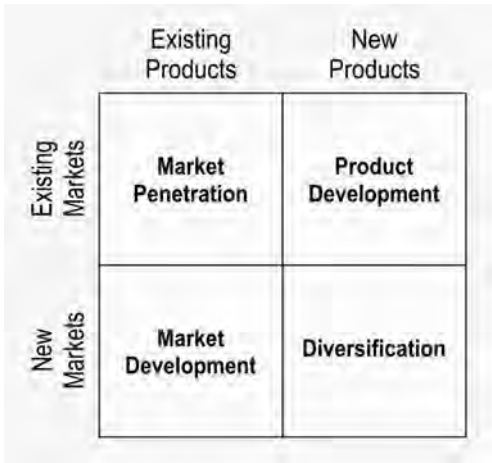
Functional-level managers are responsible for the specific business functions or operations such as human resources, purchasing, product development, customer service, and so on. Thus, a functional manager's sphere of responsibility is generally confined to one organizational activity, whereas general managers oversee the operation of a whole company or division.

8. Decision making is a managerial process and a function of choosing a particular course of action out of several alternative courses for the purpose of accomplishment of the organizational goals. Strategic decisions are different in nature than all other decisions which are taken at various levels of the organization during their day-to-day working. The major dimensions of strategic decisions are given below:

- Strategic issues require top-management decisions: Strategic issues involve thinking in totality of the organizations and also there is lot of risk involved.
- Strategic issues involve the allocation of large amounts of company resources: It may require huge financial investment to venture into a new area of business or the organization may require huge manpower with new set of skills in them.
- Strategic issues are likely to have a significant impact on the long term prosperity of the firm: Generally the results of strategic implementation are seen on a long term basis and not immediately.
- Strategic issues are future oriented: Strategic thinking involves predicting the future environmental conditions and how to orient for the changed conditions.
- Strategic issues usually have major multifunctional or multi-business consequences: As they involve organization in totality they affect different sections of the organization with varying degree.
- Strategic issues necessitate consideration of factors in the firm’s external environment: Strategic focus in organization involves orienting its internal environment to the changes of external environment.

9. The Ansoff's product market growth matrix (proposed by Igor Ansoff) is an useful tool that helps businesses decide their product and market growth strategy. With the use of this matrix, a business can get a fair idea about how its growth depends upon its markets in new or existing products in both new and existing markets.

The Ansoff's product market growth matrix is as follows:



Ansoff's Product Market Growth Matrix

Based on the matrix, ABC Ltd. may segregate its different products. Being in pharmaceuticals, development of new products is result of extensive research and involves huge costs. There are also social dimensions that may influence the decision of the company. It can adopt penetration, product development, market development or diversification simultaneously for its different products.

Market penetration refers to a growth strategy where the business focuses on selling existing products into existing markets. It is achieved by making more sales to present customers without changing products in any major way. Market development refers to a growth strategy where the business seeks to sell its existing products into new markets. It is a strategy for company growth by identifying and developing new markets for the existing products of the company. Product development is refers to a growth strategy where business aims to introduce new products into existing markets. It is a strategy for company growth by offering modified or new products to current markets. Diversification refers to a growth strategy where a business markets new products in new markets. It is a strategy by starting up or acquiring businesses outside the company's current products and markets.

As market conditions change overtime, the company may shift product-market growth strategies. For example, when its present market is fully saturated a company may have no choice other than to pursue new market.

10. The external analysis process focuses on scanning of environment in which all organizations work as sub-systems. The scanning of external environment leads to the identification of opportunities and threats & opening the organizations to the external world. While the internal analysis leads to the study of strengths and weakness which will decide to what extent each company is going to capitalize the opportunities and threats.

Moreover, strategic thinking judges about the nature of strategy and proceeds to flow directly from analysis of a company's external environment and internal situation. The analytical sequence starts from strategic appraisal of the company's external and internal situations and to evaluate alternatives for implanting the strategy choices. Accurate diagnosis of the company's situation is necessary. Managerial preparation for deciding a sound long term direction is done by setting appraisal alternate and creating a winning strategy.

Understanding of the strategic aspects of a company's external and internal environment, the changes are greatly influenced that how managers will lay out a strategic game plan. Thus, it is a major prospect for building competitive advantage and that is likely to boost company performance.

11. Businesses have to respond to a dynamic and often hostile environment in pursuit of their mission. Strategies provide an integral framework for management and negotiate their way through a complex and turbulent external environment. Strategy seeks to relate the goals of the organisation to the means of achieving them.

A company's strategy is the game plan management is using to stake out market position and conduct its operations. A company's strategy consists of the combination of competitive moves and business approaches that managers employ to please customers, compete successfully and achieve organisational objectives.

Strategy may be defined as a long range blueprint of an organisation's desired image, direction and destination what it wants to be, what it wants to do and where it wants to go. Strategy is meant to fill in the need of organisations for a sense of dynamic direction, focus and cohesiveness.

The Generic Strategies: According to Glueck and Jauch there are four generic ways in which strategic alternatives can be considered. These are stability, expansion, retrenchment and combinations.

(i) **Stability Strategies:** One of the important goals of a business enterprise is stability to safeguard its existing interests and strengths, to pursue well established and tested objectives, to continue in the chosen business path, to maintain operational efficiency on a sustained basis, to consolidate the commanding position already reached, and to optimise returns on the resources committed in the business.

(ii) **Expansion Strategy:** Expansion strategy is implemented by redefining the business by adding the scope of business substantially increasing the efforts of the current business. Expansion is a promising and popular strategy that tends to be equated with dynamism, vigor, promise and success. It is often characterised by

significant reformulation of goals and directions, major initiatives and moves involving investments, exploration and onslaught into new products, new technology and new markets, innovative decisions and action programmes and so on. Expansion includes diversifying, acquiring and merging businesses.

(iii) **Retrenchment Strategy:** A business organisation can redefine its business by divesting a major product line or market. Retrenchment or retreat becomes necessary or expedient for coping with particularly hostile and adverse situations in the environment and when any other strategy is likely to be suicidal. In business parlance also, retreat is not always a bad proposition to save the enterprise's vital interests, to minimise the adverse environmental effects, or even to regroup and recoup the resources before a fresh assault and ascent on the growth ladder is launched.

(iv) **Combination Strategies:** Stability, expansion or retrenchment strategies are not mutually exclusive. It is possible to adopt a mix to suit particular situations. An enterprise may seek stability in some areas of activity, expansion in some and retrenchment in the others. Retrenchment of ailing products followed by stability and capped by expansion in some situations may be thought of. For some organisations, a strategy by diversification and/or acquisition may call for a retrenchment in some obsolete product lines, production facilities and plant locations.

12. Many organizations in order to achieve quick growth, expand or diversify use strategies such as mergers and acquisitions. This also helps in deploying surplus funds.

Merger and Acquisition Strategy

Merger and acquisition in simple words are defined as a process of combining two or more organizations together. There is a thin line of difference between the two terms but the impact of combination is completely different in both the cases.

Some organizations prefer to grow through mergers. Merger is considered to be a process when two or more organizations join together to expand their business operations. In such a case the deal gets finalized on friendly terms. Owners of pre-merged entities have right over the profits of new entity. In a merger two organizations combine to increase their strength and financial gains.

When one organization takes over the other organization and controls all its business operations, it is known as acquisition. In the process of acquisition, one financially strong organization overpowers the weaker one. Acquisitions often happen during recession in economy or during declining profit margins. In this process, one that is financially stronger and bigger establishes it power. The combined operations then run under the name of the powerful entity. A deal in case of an acquisition is often done in an unfriendly manner, it is more or less a forced association where the powerful organization takes over a weaker entity.

Types of Mergers

1. **Horizontal merger:** Horizontal mergers are combinations of firms engaged in the same industry. It is a merger with a direct competitor. The principal objective behind this type of mergers is to achieve economies of scale in the production process by shedding duplication of installations and functions, widening the line of products, decrease in working capital and fixed assets investment, getting rid of competition and so on. For example, formation of Brook Bond Lipton India Ltd. through the merger of Lipton India and Brook Bond.

2. **Vertical merger:** It is a merger of two organizations that are operating in the same industry but at different stages of production or distribution system. This often leads to increased synergies with the merging firms. If an organization takes over its supplier/producers of raw material, then it leads to backward integration. On the other hand, forward integration happens when an organization decides to take over its buyer organizations or distribution channels. Vertical merger results in operating and financial economies. Vertical mergers help to create an advantageous position by restricting the supply of inputs or by providing them at a higher cost to other players.

3. **Co-generic merger:** In co-generic merger two or more merging organizations are associated in some way or the other related to the production processes, business markets, or basic required technologies. Such merger include the extension of the product line or acquiring components that are required in the daily operations. It offers great opportunities to businesses to diversify around a common set of resources and strategic requirements. For example, an organization manufacturing refrigerators can diversify by merging with another organization having business in kitchen appliances.

4. **Conglomerate merger:** Conglomerate mergers are the combination of organizations that are unrelated to each other. There are no linkages with respect to customer groups, customer functions and technologies being used. There are no important common factors between the organizations in production, marketing, research and development and technology. In practice, however, there is some degree of overlap in one or more of these factors.

13. Management of logistics is a process which integrates the flow of supplies into and out of an organization to achieve a level of service which ensures that the right materials are available at the right place, at the right time, of the right quality, and at the right cost.

To have an effective logistics strategy, the organization has to ponder the following issues and formulate strategy comfortable with their issues:

- The sources of raw materials and components needed for production of goods.
- To ascertain the number of manufacturing units, their location etc to decide about transport facility.

- Products being produced at different manufacturing location.
- To decide about the different modes of transportation facilities.
- What is the nature of distribution facilities?
- What is the nature of materials handling equipment possessed? Is it ideal?
- What is the method for deploying inventory in the logistics network?
- Should the business organization own the transport vehicles?

14. Research and development (R&D) personnel can play an integral part in strategy implementation. These individuals are generally charged with developing new products and improving old products in a way that will allow effective strategy implementation. R&D employees and managers perform tasks that include transferring complex technology, adjusting processes to local raw materials, adapting processes to local markets, and altering products to particular tastes and specifications.

Technological improvements that affect consumer and industrial products and services shorten product life cycles. Companies in virtually, every industry are relying on the development of new products and services to fuel profitability and growth. Surveys suggest that the most successful organizations use an R&D strategy that ties external opportunities to internal strengths and is linked with objectives. Well formulated R&D policies match market opportunities with internal capabilities. R&D policies can enhance strategy implementation efforts to:

- Emphasize product or process improvements.
- Stress basic or applied research.
- Be leaders or followers in R&D.
- Develop robotics or manual-type processes.
- Spend a high, average, or low amount of money on R&D.
- Perform R&D within the firm or to contract R&D to outside firms.
- Use university researchers or private sector researchers.

15. Successful strategy formulation does not guarantee successful strategy implementation. It is always more difficult to do something (strategy implementation) than to say you are going to do it (strategy formulation)! Although inextricably linked, strategy implementation is fundamentally different from strategy formulation.

Strategy implementation is different from strategy formulation. Strategy formulation is an intellectual process but strategy implementation is an operational process. Strategy formulation is positioning forces before the action which focuses on effectiveness whereas strategy implementation is managing forces during the action which focuses on efficiency. Strategy formulation requires good intuitive and analytical skills and coordination among a few individuals but strategy implementation requires special motivation and leadership skills and combination among many individuals. So the strategy implementation is more difficult than strategy formulation.

16. A Strategic Business Unit (SBU) is a grouping of related businesses that can be taken up for strategic planning distinct from the rest of the businesses. Products/businesses within an SBU receive same strategic planning treatment and priorities. Products/businesses that are related from the standpoint of "function" are assembled together as a distinct SBU.

Strategic Business Unit (SBU) is beneficial for improving the competitive advantage of a firm in the following ways:

- A scientific method of grouping the businesses of a multi-business corporation which helps the firm in strategic planning.
- An improvement over the territorial grouping of businesses and strategic planning based on territorial units.
- An SBU is a grouping of related businesses that can be taken up for strategic planning distinct from the rest of the businesses. Products/businesses within an SBU receive same strategic planning treatment and priorities.
- Products/businesses that are related from the standpoint of "function" are assembled together as a distinct SBU.
- Unrelated products/businesses in any group are separated. If they could be assigned to any other SBU applying the criterion of functional relation, they are assigned accordingly; otherwise they are made into separate SBUs.
- Grouping the businesses on SBU lines helps the firm in strategic planning by removing the vagueness and confusion generally seen in grouping businesses.
- Each SBU is a separate business from the strategic planning standpoint. In the basic factors, viz., mission, objectives, competition and strategy-one SBU will be distinct from another.
- Each SBU will have its own distinct set of competitors and its own distinct strategy.
- Each SBU will have a CEO, so it can be managed separately for profit performance and will have better controlling.

17. Medical organisations such as hospitals are often not-for-profit organisations. At the same time there is existence of medical organisations that have commercial interest. Whether they run for profit or are in charitable nature, the tools and techniques of strategic management are equally important. The role of strategic management can be expressed as follows.

Medical organisations need to follow the process of strategic management. They work under complex and turbulent environment with changes in macroeconomic factors covering economic, social, legal, technological factors. They need to set their mission, look for strategic alternatives and implement their chosen strategies, etc. In fact, all the steps in the process of strategic management are relevant for them. Medical organisations may also have survival and growth strategies. Hospitals may diversify to form chain of pathological labs or open pharmaceutical shops. Strategic management can also help in providing better services to the patients.

Like any organisation, medical organisations also compete with each other. Strategic management helps to function and succeed within the competitive pressures.

Thus the role of strategic management in medical organizations is similar to any other organisation. In fact, Hospitals are creating new strategies today with advances in the diagnosis and treatment methods. Hospitals are bringing services to the patient as much as bringing the patient to the hospital. Pathological laboratories have started collecting door-to-door samples. Providing day-treatment facilities, electronic monitoring at home, user-friendly ambulatory services, and laboratory testing.

18. Six sigma means maintenance of the desired quality in processes and end products. It takes a systematic and integrated effort towards improving quality and reducing cost besides meeting and improving the organizational goals related to quality, cost, scheduling, manpower, new products and so on. It works continuously towards revising the current standards and establishing higher ones.

Conclusively, six sigma starts with a dream or vision to have the goal of near perfect products and services and superb customer satisfaction. Managers and leaders should accept the challenge to keep the organization adaptable with the changing environment.

Six sigma is often related to Motorola, the company that has invented it. It pointed out that modern technology was so complex that old ideas about acceptable quality levels are no longer acceptable. The success of Motorola effectively changed the focus of quality worldwide. Many corporate giants like Xerox, Boeing, GE, Kodak etc followed Motorola's lead. In India also Tata's, WIPRO and Bharti's and others are effectively reaping the benefits of six-sigma.

With the help of improved technology and other tools, Management is able to enhance the quality of their products and therefore meets the human unending demand for better quality products and services. Six Sigma helps the management to not only restrict itself in satisfying the existing desires of customers or to put boundary on quality by limiting it to current information and perspective of customers rather, it also helps to be futuristic i.e., in addition to meeting customer's present expectations it should also be able to improve them.