

PAPER – 6 : INFORMATION TECHNOLOGY AND STRATEGIC MANAGEMENT

Section–A : Information Technology

Attempt all questions

Question 1

(a) Describe briefly, the following terms:

- (i) Touch Screen
- (ii) Switch
- (iii) Data Centre
- (iv) Data Dictionary
- (v) URL

(b) Explain each of the following:

- (i) Cache Memory
- (ii) Boot Record
- (iii) Spooling Software
- (iv) Internet Browser
- (v) Index Field.

(5 + 5 = 10 Marks)

Answer

- (a) (i) Touch Screen: It is used in information providing systems. It consists of a screen which is lined with light emitting devices on its vertical sides and photo-detectors are placed on the horizontal sides. When the user's finger approaches the screen, the light beam is broken and is detected by the photo detectors. It is more effect than the mouse.
- (ii) Switch: It is hardware device used to direct messages across a network. Switches create temporary point to point links between two nodes on a network and send all data along that link.
- (iii) Data Centre: It is a centralized depository for the storage, management and discrimination of data and information. It can be defined as highly secure, fault-resistant facilities, hosting customer equipment that connects to telecommunications networks.
- (iv) Data Dictionary: A Data Dictionary is a set of metadata that contains definitions and representations of data elements. It maintains information pertaining to structure and usage of data and meta data.
- (v) Uniform Resource Locators (URL): are used to address and access individual web pages and internet resources. The format of URL is protocol / internet address / web page address.

Example:

<http://www.icaai.org/seminars.html>

- (b) (i) **Cache Memory:** Processors incorporate a special type of internal memory (cache) to boost processing power significantly. Some of the information in the main memory is duplicated in the cache memory which is slightly slower but of much greater capacity than the processor register and faster but much smaller than main memory. It comes in two types :  $L_1$  and  $L_2$  Cache.
- (ii) **Boot record:** Booting is a process that starts operating systems when the user turns on a computer system. Boot record is a small program that runs when the computer is started. The Boot record program checks the basic component and the files of the operating system which is used to run the system successfully.
- (iii) **Spooling Software:** The purpose of spooling software is to compensate for the speed difference between the computer and its peripheral devices such as input and output devices. It is used in large system and network computing environment.
- (iv) **Internet Browser:** It is a application software that enables a user to display and interact with text, images and other information typically located on a web page at a website on the world wide web or local area network. Microsoft Internet Explorer is the most popular internet browser.
- (v) **Index field:** Index fields are used to store relevant information along with a documents. The data input to an index field is used to find those documents when needed. The program provides upto twenty five user definable index fields in an index set.

#### Question 2

Answer any two:

- (a) Describe DDL and DML.
- (b) Explain Electronic Data interchange and its advantages.
- (c) Describe the various characteristic of client/server technology. (2 × 5 = 10 Marks)

Answer

- (a) (i) **Data Definition Language (DDL):** It defines the conceptual schema providing a link between the logical and physical structures of the database. The logical structure of a database is a schema. A subschema is the way a specific application views the data from the database.

Following are the functions of Data Definition Language (DDL):

- (a) They define the physical characteristics of each record, field in the record, field's type and length, field's logical name and also specify relationships among the records.
- (b) They describe the schema and subschema.

- (c) They indicate the keys of the record.
- (d) They provide means for associating related records or fields.
- (e) They provide for data security measures.
- (f) They provide for logical and physical data independence.

(ii) Data Manipulation Language (DML):

DML is a Database Language used by data base users to retrieve, insert, delete and update data in a database.

Following are the functions of Data Manipulation Language (DML):

- (a) They provide the data manipulation techniques like deletion, modification, insertion, replacement, retrieval, sorting and display of data or records.
- (b) They facilitate use of relationships between the records.
- (c) They enable the user and application program to be independent of the physical data structures and database structures maintenance by allowing to process data on a logical and symbolic basis rather than on a physical location basis.
- (d) They provide for independence of programming languages by supporting several high-level procedural languages like COBOL, PL/1 and C++.

- (b) Electronic Data Interchange (EDI) is the transmission, in the standard syntax, of unambiguous information of business or strategic significance between computers of independent organisations. The users of EDI do not have to change their internal databases. However, users must translate this information to or from their own computer system format, but this translation software has to be prepared only once.

In simple terms, Electronic Data Interchange (EDI) is computer-to-computer communication using a standard data format to exchange business information electronically between independent organisations. EDI does not merely aid in transmitting documents but dynamically moves data between companies' computer systems. Computer-to-computer transfer can be direct between two companies using an agreed upon data protocol, or it can be performed by a third party service vendor. Users can transmit business documents like quotes, shipping notices and even payment orders electronically to customers and suppliers. Design documents, electronic fund transfers and database transactions also come under EDI umbrella.

Following are the advantages for use of EDI are:

- (i) Issue and receive orders faster.
- (ii) Make sales more easily.
- (iii) Get paid sooner.
- (iv) Minimize capital tied up in inventory.
- (v) Reduce letters and memos.
- (vi) Decrease enquiries.

- (vii) Make bulk updates of catalogues and part listings.
- (c) Characteristics of C/S Technology:
  - (i) It consists of client process and a server process that can be distinguished from each other.
  - (ii) The client portion and the server portion can operate on separate platforms.
  - (iii) Either the client or the server platform can be upgraded without having to upgrade the other platform.
  - (iv) The server is able to service multiple clients concurrently.
  - (v) The system includes some sort of networking capability.
  - (vi) A significant portion of application logic resides at the client end.
  - (vii) Action is usually initiated at the client end and not the server end.
  - (viii) User friendly GUI resides at the client end.
  - (ix) SQL capability is available.
  - (x) Database server provides data protection and security.

**Question 3**

- (a) Discuss various Data transmission modes.
- (b) What are the management problems of file processing system? (4 + 6 = 10 Marks)

**Answer**

- (a) There are three Data transmission modes:
  - (i) Simplex: A simplex communication mode permits data to flow in only one direction. A terminal connected to such a line is either a send-only or a receive only device. Simplex mode is seldom used because a return path is generally needed to send acknowledgements, control or error signals.
  - (ii) Half duplex: In this mode, data can be transmitted back and forth between two stations, but data can only go in one of the two directions at any given point of time.
  - (iii) Full duplex: A full duplex connection can simultaneously transmit and receive data between two stations. It is most commonly used communication mode. A full duplex line is faster, since it avoids the delay that occurs in a half-duplex mode each time the direction of transmission is changed.
- (b) Following are the problems of file processing system:
  - (i) Data duplication: Independent data files include a lot of duplicated data; the same data is recorded and stored in several files. This data redundancy causes problems when data has to be updated, as separate file maintenance programs are needed.
  - (ii) Lack of data integration: Having data in independent files makes it difficult to provide end-user with information for adhoc requests that require accessing data

stored in several files. Special programs have to be written to retrieve data from each file.

- (iii) Data dependence: In file processing system, major components of a system i.e. the organization files, their physical locations on storage, hardware and the applications software used to access those files depend on one another. Thus, if changes are made in the format and structure of data and records in a file, changes have to be made in all the programs that use these files. Thus program maintenance is a major burden.
- (iv) Other problems: In file processing systems, data elements such as stock numbers and customer addresses are generally defined differently by different end users and applications. This causes serious inconsistency in the development of programs.

#### Question 4

A University has 3,000 students. These students are divided in four categories:

- (i) B. Tech
- (ii) M. Tech
- (iii) M.S.
- (iv) Ph.D.

Draw a flow chart for finding the percentage of the students in each category. (10 Marks)

Answer

The flow chart is given on next page

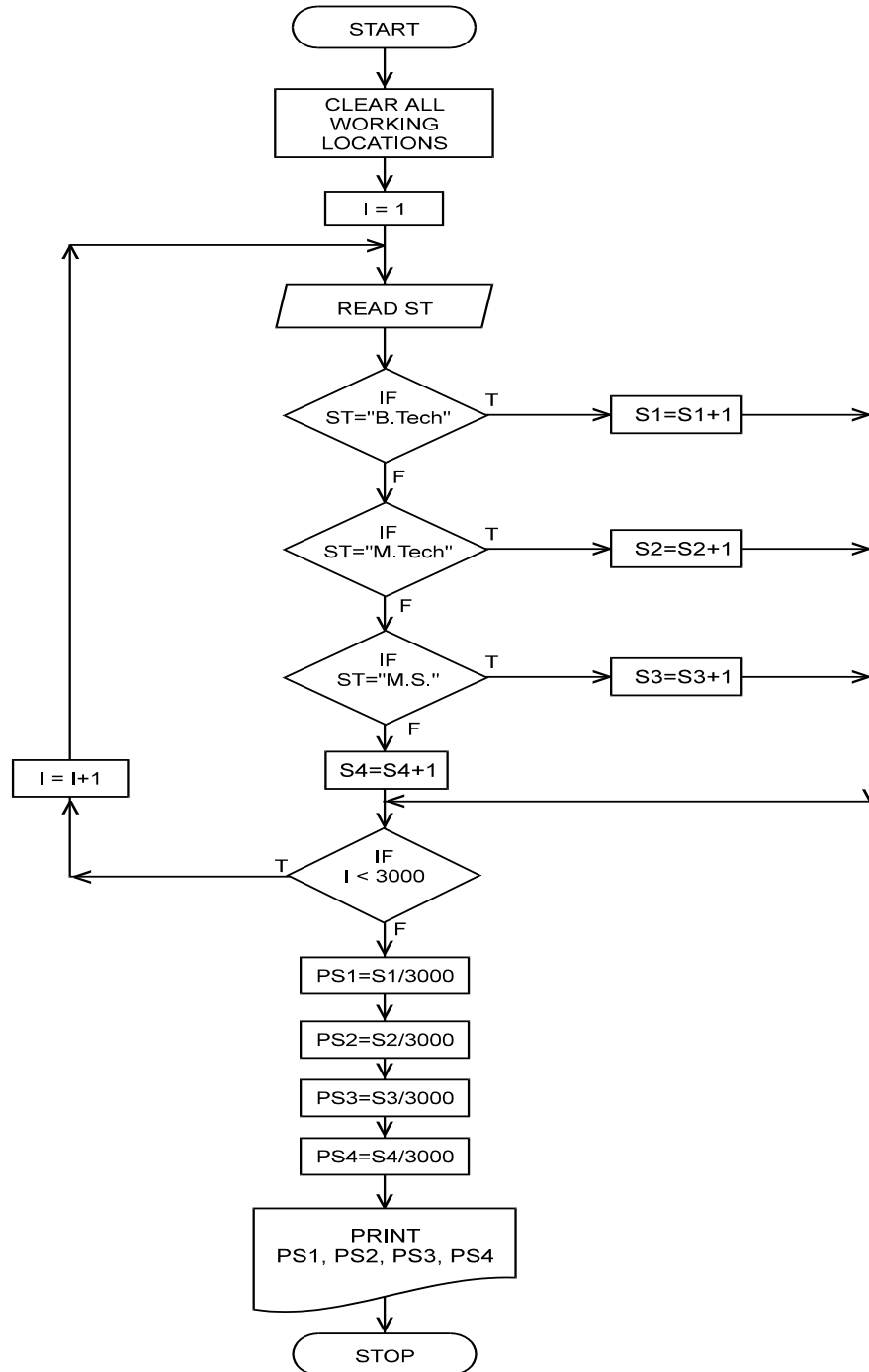
#### Question 5

Write short notes on the following:

- (i) Expert system.
- (ii) Blue tooth. (2 × 5 = 10 Marks)

Answer

- (i) Expert System: An expert system is a computerized information system that allows non-expert to made decisions comparable to those of an expert. It is a knowledge based system that contains the subject specific knowledge, and analytical skills of one or more human expert. An expert system typically contain the following components:
  - (i) Knowledge base: This includes the data, knowledge, relationships, rules of thumb and decision rules used by experts to solve a particular problem.
  - (ii) Inference engine: This program contains the logic and reasoning mechanisms that simulate the expert logic process and deliver advice. It uses data obtained from knowledge base and user to draw inference, form its conclusions and recommend a course of action.



Abbreviations:

ST = Student ,      PS1 to PS4 = Percentage,      S1 to S4 = No. of Student,  
T = True,      F = False

- (iii) User interface: This program allows the user to design, create, update, use and communicate with the expert system.
  - (iv) Explanation facility: This facility provides the user with an explanation of the logic so that the expert system used to arrive at its conclusion.
  - (v) Knowledge acquisition facility: This facilitates in extracting an individuals expertise and entering it into the knowledge base.
- (ii) Bluetooth

Bluetooth is a specification that describes how mobile phones, computers and personal digital assistants (PDA) can be easily interconnected using a short range wireless connections. Using this technology, user of cell phone and PDA can get quickly synchronized with information in desktop or notebook, initiate the sending or receiving of a fax, initiate a print out or in general, have a total coordination between these devices.

Bluetooth requires that a low cost transceiver chip be included in each device. The transceiver transmits and receives in a frequency band of 2.45 GHz that is available globally. In addition to data, upto three voice channels are available. Each device has a unique 48 bit address from the IEEE 802 standard. Connection can be point-to-point or multipoint. The maximum range is 10 meters. Data can be exchanged at a rate of 1Mbps. Built-in encryption and verification module is provided. A frequency hop scheme allows devices to communicate even in areas with great deal of electromagnetic interference.

### Section–B : Strategic Management

Attempt all questions

#### Question 6

State with reasons which of the following statements is correct/incorrect. (Attempt any three statements):

- (a) The basic objective of a business enterprise is to monitor the environment.
- (b) The first step of strategy formulation in strategic management model is to undertake internal analysis.
- (c) The main focus of six sigma is on the shareholders.
- (d) Functional level constitutes the lowest hierarchical level of strategic management.
- (e) Retrenchment implies downsizing of business. (3 × 2 = 6 Marks)

Answer

- (a) Incorrect: Monitoring environment is ancillary to basic objectives of a business enterprise. It is imperative for organisations to create and retain customers. Organisational objectives may include survival, stability, growth, profitability and like. Organisations monitor the changes in the environment, analyse their impact on their own

goals and activities and translate their assessment in terms of specific strategies for survival, stability and strength.

- (b) Incorrect: Identifying an organisation's existing vision, mission, objectives, and strategies is the starting point for any strategic management process because an organisation's existing situation and condition may preclude certain strategies and may even dictate a particular course of action. Determining vision and mission provides long-term direction, delineate what kind of enterprise the company is trying to become and infuse the organisation with a sense of purposeful action.
- (c) Incorrect: Although any business action may result directly or indirectly in creation/erosion of shareholders wealth, the main focus of six sigma is on delivering value to the customers. Six sigma aims in improving customer satisfaction. Primarily, six sigma means maintenance of the desired quality in processes and end products. It also means taking systematic and integrated efforts toward improving quality and reducing cost.
- (d) Correct: Functional-level managers and strategies operate at the lowest hierarchical level of strategic management. Functional level is responsible for the specific business functions or operations (human resources, purchasing, product development, customer service, and so on) that constitute a company or one of its divisions. Although they are not responsible for the overall performance of the organisation, functional managers nevertheless have a major strategic role to develop functional strategies in their area that help to fulfil the strategic objectives set by business and corporate-level managers.
- (e) Incorrect: In the context of strategic management, retrenchment implies giving up certain products and reducing the level of business as a compulsive measure to cope up with certain adverse developments on which the firm has little control. Downsizing (or rightsizing) is planned elimination of positions or jobs. Retrenchment does not imply downsizing, however, the latter is often used to implement a retrenchment strategy.

#### Question 7

Briefly answer any two of the following question in 2-3 sentences each:

- (a) What is a mission statement?
- (b) In B.C.G. matrix for what the metaphors like stars, cows and dogs are used?
- (c) What are forward and backward integration? (2 × 2 = 4 Marks)

#### Answer

- (a) Mission statement is an answer to the question "Who we are and what we do" and hence has to focus on the organisation's present capabilities, focus activities and business makeup. An organisation's mission states what customers it serves, what need it satisfies, and what type of product it offers. It is an expression of the growth ambition of the organisation.

- (b) The BCG growth-share matrix is a popular way to depict different types of products or SBU as follows:
- Stars are products or SBUs with high market share in a market which is growing rapidly.
  - Cash Cows are low-growth, high market share businesses or products.
  - Question Marks are low market share business in high-growth markets.
  - Dogs are low-growth, low-share businesses and products.
- (c) Organisations may enter into new business that is related to its existing business. The firm remains vertically within the same process. Sequentially, it moves forward or backward in the chain and enters specific product/process steps with the intention of making them into new businesses for the firm.

#### Question 8

What do you understand by 'Strategy'? Explain the four generic strategies as discussed by Glueck and Jauch. (10 Marks)

#### Answer

Businesses have to respond to a dynamic and often hostile environment for 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 include 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.

#### Question 9

Define each of the following and analyse its role in strategic implementation:

- (a) B.P.R.
- (b) ERP
- (c) Benchmarking
- (d) Value chain. (4 × 2½ = 10 Marks)

#### Answer

- (a) BPR: BPR stands for business process reengineering. It refers to the analysis and redesign of workflows both within and between the organisation and the external entities. Its objective is to improve performance in terms of time, cost, quality, and responsiveness to customers. It implies giving up old practices and adopting the improved ones. It is an effective tool of realising new strategies.

Improving business processes is paramount for businesses to stay competitive in today's marketplace. New technologies are rapidly bringing new capabilities to businesses, thereby raising the strategical options and the need to improve business processes dramatically. Even the competition has become harder. In today's market place, major changes are required to just stay even.

- (b) ERP: ERP stand for enterprise resource planning which is an IT based system linking isolated information centers across the organisation into an integrated enterprise wide

structured functional and activity bases. ERP is successor to MRP systems (material requirements and manufacturing resource planning systems). ERP is used for strengthening the procurement and management of input factors.

Modern ERP systems deliver end-to-end capabilities to support the entire performance management of an organisation. It helps in consolidated financial reporting, financial management, planning, budgeting, performance management and so on.

- (c) **Benchmarking:** It is a process of finding the best practices within and outside the industry to which an organisation belongs. Knowledge of the best helps in standards setting and finding ways to match or even surpass own performances with the best performances.

Benchmarking is a process of continuous improvement in search for competitive advantage. Firms can use benchmarking process to achieve improvement in diverse range of management function like maintenance operations, assessment of total manufacturing costs, product development, product distribution, customer services, plant utilisation levels and human resource management

- (d) **Value Chain:** Value chains facilitates procurement of whole range of inputs that are required to produce a product or service so that the process can be performed in an integrated and optimum manner. Vendors, transporters, and buyers are the components of the value chain and share the benefits of such chains.

Value chain recognises organisations as more than a random collection of machines, money and people. These resources are of no value unless deployed into activities and organised into routines and systems which ensure that products or services are produced which are of value to the final consumer/user.

#### Question 10

DD is the India's premier public service broadcaster with more than 1,000 transmitters covering 90% of the country's population across an estimated 70 million homes. It has more than 20,000 employees managing its metro and regional channels. Recent years have seen growing competition from many private channels numbering more than 65, and the cable and satellite operators (C & S). The C & S network reaches nearly 30 million homes and is growing at a very fast rate.

DD's business model is based on selling half-hour slots of commercial time to the programme producers and charging them a minimum guarantee. For instance, the present tariff for the first 20 episodes of a programme is Rs. 30 lakhs plus the cost of production of the programme. In exchange the producers get 780 seconds of commercial time that he can sell to advertisers and can generate revenue. Break-even point for producers, at the present rates, thus is Rs. 75,000 for a 10 second advertising spot. Beyond 20 episodes, the minimum guarantee is Rs. 65 lakhs for which the producer has to charge Rs. 1,15,000 for a 10 second spot in order to break-even. It is at this point the advertisers face a problem – the competitive rates for a 10 second spot is Rs. 50,000. Producers are possessive about buying commercial time on DD. As a result the DD's projected growth of revenue is only 6-10% as against 50-60% for the

private sector channels. Software suppliers, advertisers and audiences are deserting DD owing to its unrealistic pricing policy.

DD has three options before it. First, it should privatise, second, it should remain purely public service broadcaster and third, a middle path.

The challenge seems to be to exploit DD's immense potential and emerge as a formidable player in the mass media.

- (i) What is the best option, in your view, for DD?
- (ii) Analyse the SWOT factors the DD has.
- (iii) Why to you think that the proposed alternative is the best? (20 Marks)

Answer

- (i) For several years Doordarshan was the only broadcaster of television programmes in India. After the opening of the sector to the private entrepreneur (cable and satellite channels), the market has witnessed major changes. The number of channels have increased and also the quality of programmes, backed by technology, has improved. In terms of quality of programmers, opportunity to advertise, outreach activities, the broadcasting has become a popular business. Broadcasters too have realised the great business potential in the market. But for this, policies need to be rationalised and be opened to the scope of innovativeness not only in term of quality of programmes. This would not come by simply going to more areas or by allowing bureaucratic set up to continue in the organisation.

Strategically the DD needs to undergo a policy overhaul. DD, out of three options, namely privatisation, public service broadcaster or a middle path, can choose the third one, i.e. a combination of both. The whole privatisation is not possible under the diversified political scenario. Nor it would be desirable to hand over the broadcasting emotively in the private hand as it proves to be a great means of communication of many socially oriented public programmers. The government could also think in term of creating a corporation (as it did by creating Prasar Bharti) and provide reasonable autonomy to DD. So far as its advertisement tariff is concerned that can be made fairly competitive. However, at the same time cost of advertising is to be compared with the reach enjoyed by the doordarshan. The number of viewers may be far more to justify higher tariffs.

- (ii) The SWOT analyses involves study of strengths, weaknesses, opportunities and threats of an organisation. SWOT factors that are evidently available to the Doordarshan are as follows:

S – Strength

- More than 1000 transmitters.
- Covering 90% of population across 70 million homes against only 30 million home by C & S.

- More than 20,000 employees.

W – Weakness

- Rigid pricing strategy.
- Low credibility with certain sections of society.
- Quality of program's is not as good as compared to C & S network

O – Opportunities

- Infrastructure can be leased out to cable and satellite channel.
- Digital terrestrial transmission.
- Regional focused channels.
- Allotment of time, slots to other broadcasters.

T – Threats

- Desertion of advertisers and producers may result in loss of revenues.
- Due to quality of program the reach of C & S network is continuously expanding.
- As the C & S network need the trained staff, some employees of DD may switchover and take new jobs.
- Best of the market-technology is being used by the private channels.

- (iii) It is suggested that the DD should adopt a middle path. It should have a mix of both the options. It should economise on its operational aspects and ensure more productivity in term of revenue generation and optimisation of use of its infrastructure.

Wherever, the capacities are underutilised, these may be leased out to the private operations. At the same time quality and viewership of programmes should be improved.

Bureaucracy may reduce new strategic initiatives or make the organisation less transparent. Complete privatisation can fetch a good sum and may solve many of the managerial and operational problems. However, complete public monopoly is not advisable because that denies the government to fully exploit the avenue for social and public use. The government will also lose out as it will not be able to take advantage of rising potential of the market.