Unit 2 Managing Information Systems in Organisations

Structure

2.1 Introduction

Managers have to cope with systems within organisations, as also deal with the Internet and the facilities it provides. Information systems in an organisation have to be understood as artefacts that interact with the people of the organisation. Their presence has both short-term and long-term consequences, and

these effects are moderated by the culture and processes within the organisation. When systems are initiated, built, and sustained in the organisation their impact is felt through use or disuse. The modern manager has to make many decisions regarding IS, such as determining what services to provide, how much to spend, and how to secure the systems.

2.1.1 Objectives

After studying this unit, you will be able to:

- summarise the evolution of information systems
- explain the IT interaction model
- distinguish between first- and second-order effects
- evaluate effects of competition, organisational traits and organisational structure on success of IS implementation
- analyse what information systems to build and the costing
- evaluate the level of capabilities that can be created using IS and security levels required
- create a technology plan to support an organisation

2.2 Case Study

Mudra Communications Ltd. – IT as an Enabler

The Mudra Group is a leading integrated marketing communications group in India offering the complete range of marketing communications services. This consists of print, channels, out-of-home (OOH) services, direct marketing, health and life sciences, digital marketing, event management, and rural marketing. Mudra started in 1980 in Ahmedabad, is currently headquartered in Mumbai, and has 1150 employees in 26 locations. It delivers total branding solutions through four agency networks: Mudra India, DDB Mudra, Mudra MAX, and Ignite Mudra. Mudra's over 100 clients include marquee names, ensuring a healthy mix between Indian and foreign businesses.

The Indian advertising industry has been evolving rapidly over the past few years owing to the proliferation of new means of communication and the emergence of new distribution channels. The industry growth is on an average twice that of the GDP, with a potential of growing four times the GDP growth. The growth drivers are expected to be the buoyancy in the Indian industry across multiple sectors, locally targeted advertising on mediums such as radio, potential offered by 3G services, the increasing proliferation of the online medium, and the increasing penetration levels of the various distribution channels.

The advertising market in India is dominated by O&M, JWT, Lowe, and Mudra, who between them hold a substantial aggregate market share. Though these firms are diversified in their operations, they offer similar services, differentiating themselves from one another only by their range of services, client lists, and campaign records. The slow growth during the trough of 2008/2009 has increased rivalry amongst the handful of advertising agencies at the top.

The success of advertising businesses today primarily revolves around maximising the content and the intellectual property (IP) that revolves around it. IT is seen as an enabling function with a focus on deploying best-in-class applications for content management; and leveraging enterprise solution for enabling core operations and maximising synergies across the business verticals. Leveraging managed services by transitioning to a model of outsourced technology and processes is seen as a recent trend adopted by many media companies who see the role of IT as predominantly an enabling-and-support function.

Mudra's IT vision started off with setting up their basic business applications along with the necessary IT infrastructure required to support them. Since the early 1980s, Mudra had continuously deployed a series of IT applications to manage their business. By the turn of the century, they had accumulated a vast set of legacy applications and embarked on a program to revamp the IT landscape to align with their growth target.

Over the next decade, Mudra developed and deployed a suite of applications to enable efficient business operations such as: mBOSS – an integrated accounting and operations package; mBusy – a budgeting and

monitoring system; eHRMS – an employee self-help portal; mTract – a centralised studio resource repository, and 'Mudra One View' – their corporate dashboard.

Apart from leveraging IT applications for business process excellence, Mudra also focussed on leveraging IT for creating competitive differences for their clients. Mudra's CRM application is designed to store their history of brands and its strategies. Mudra boasts of having launched many a successful brands over the last three decades, such as Rasna, Vimal, Dhara, Samsung, McDonalds among others. Key historical information of brand launches, strategies, and their performance are stored in their CRM application, enabling them and their clients to review past strategies to develop new ones. In addition, they have deployed an application called LightHouse, a knowledge management application to capture consumer insights, media insights, and brand happenings. LightHouse provides key knowledge-aid to support business development and operations. Mudra also receives regular feeds from media analysis companies such as TAM and Neilson that comprise enormous amounts of analytical data. Mudra deployed a DataWarehouse and Business Intelligence (DW&BI) solution to store and mine these data to extract insights from them.

Most of the applications at Mudra have been developed and deployed using open-source technologies including Red Hat Linux, JBOSS application server, Liferay open portal, Alfresco for knowledge management, and Pentaho as the business intelligence system.

Mudra, over the last decade has leveraged IT for improving their business efficiency and competitive edge: not just for themselves but for the clients as well. The media and advertising space is expected to undergo significant changes as it adapts to a world dominated by the Internet and mobile technologies and driven by social media. Mudra is viewing this as an opportunity that can sustain their current annualised growth of 25%. As technology becomes a primary driver in this growth story, Mudra will need to ensure that they leverage emerging technologies such as Mobile technologies, Social networking engines, Big Data management, and Cloud services. How effectively will they leverage these technologies will determine whether they meet their ambitious target of an eight-fold growth by 2020.

2.3 Managing in the Internet Era

The Web is a vast store of data and information. One challenge for organisations is to have a clear set of practices to frequently find and use the data relevant and useful for them. A large amount of data may be useful, but it can only be so if the data does not overwhelm the seeker. With the current availability of data on the Web, it is easy for the most important data to be buried in some inaccessible manner.

The Internet's services, such as e-mail, the Web, data transfer capabilities, online audio and video communication, enable organisations to connect with the world both to learn about the world and also to make themselves be known. It is necessary for organisations to create a *presence* on the Internet, which is usually in the form of a site on the Web. Other forms of creating a presence are also used, such as social networking sites.

Many application services are now available over the Internet. Earlier these applications used to reside on the internal IS of organisations. Applications that could be used to store data, process it in specific ways, and share it with partners outside the organisation are all possible through the Web and Internet-based applications. These external services are much cheaper and more convenient to access than the older methods and organisations have to decide whether to adopt these services or not.

Though the Internet has opened up a world of data and services for organisations, it has also given rise to security threats. Organisations around the world are wary of the many ways in which they could be made vulnerable and harm could be caused to them. The services of the Internet have been used to attack the online presence of organisations and use devious means to enter internal networks, impersonate people, steal data or money, and release harmful software such as viruses. Most organisations have to formulate policies and plans for dealing with such security threats.

Self Assessment Questions:

1. Internet always affects the online presence of organisations in a positive manner. (True/False)

2.4 Managing Information Systems in Organisations

2.4.1 The IT interaction model

Managing IS in organisations is a highly challenging and complex task. One reason for this complexity is that neither organisations nor the IS they use remain static over time – both change continuously, and it is the job of management to ensure that the systems remain useful and relevant for their organisational goals at all times. Organisations change to respond to the needs of the business and economic environment in which they thrive. They may have to change their services, their products, their internal structure, and the manner in which they do their business to meet the challenges of the environment. Organisations also change as their employees gain more experience and learn and adjust to their work environment. The employees change the manner in which they work, including the manner in which they work with IS, and with this they change the way processes within organisations are carried out.

One way to understand IS and organisations is to see how these two entities interact. Figure 2.1 depicts the IT interaction model. When organisations introduce new IS they expect certain changes to happen. These changes are related to the functions that IS are supposed to perform. For example, if the IS are supposed to process the monthly payroll for employees, then it is quite possible that the organisation has implemented this IS to increase the speed at which the payroll is processed and also the accuracy of the calculations. These

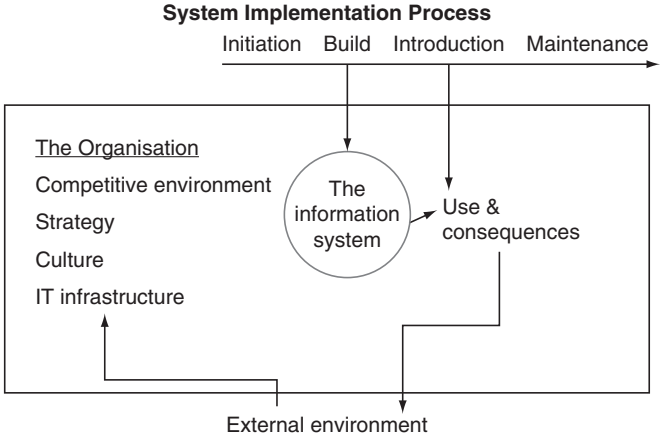

Fig. 2.1: IT interaction model

are positive changes the organisation wants as it has spent time and money in implementing this new IS.

If the changes the organisation expects are realised then this may turn out to be a positive outcome for it.

For a commercial organisation, this may lead to increased profits, which is the very goal of the organisation. The new IS could also lead to better employee satisfaction and an improved ability to manage employee benefits and remuneration. These outcomes are what the organisation would have planned for and would welcome them. However, it is also possible that these benefits are *not* realised. It is possible that the IS may not perform as expected and there is not much improvement either in the organisation's profits or in employee's satisfaction. This possibility could arise if the implementation of the system was not according to the needs of the organisation or it was implemented in a faulty manner and had many problems in delivering its desired results. Or it could be that even though the system was implemented properly, there were employees in the organisation who were opposed to its implementation and did not want to use it in the intended manner. Such situations are known to happen and are often referred to as resistance to change in organisation.

2.4.1.1 First-order and second-order effects

The outcome of the implementation of a new IS could be positive or not, and this will depend on the situation at the organisation. The outcomes that arise as a direct consequence of the introduction of an IS are known as *first-order effects*. They are usually visible in organisations in the form of increased speed of processing of data or increased volume of processing and these are what any organisation would have intended to gain from the IS that it has implemented. The first-order effects can be positive or negative depending on how the organisation adapts to the new system.

The increased use of the IS could lead to further changes in the organisation, not all of which may have been anticipated. In the payroll system example, with the increased use the organisation may find that its hiring, transfer, and promotion processes are easier to manage, and further it is able to create new and innovative incentive schemes to motivate its employees. This may improve its ability over time to retain and attract better employees, which would further lead to the organisation's standing in the market and improve its overall

profitability. Such effects would not be immediately visible as they may require years to become visible or measurable. These outcomes are known as *second-order effects*.

When any particular firm in a competitive industry implements an IS for a particular application and realises benefits from it, it is quite likely that its competitors will follow its example. This is likely because the competing firms would not want to lose out on an advantage that their competitor has, which could result in losing their market share and profits in future. This competitive pressure may force all firms in the industry to adopt such an IS to retain their competitive position. As adoption of the IS grows in the industry as a whole, it presents opportunities for industry bodies or other agencies to use these facilities. For example, if a payroll system is used by all firms in an industry located in a given city, the city government may be able to provide special incentives to the employees of these firms to adopt certain practices, such as car-pooling to reduce city traffic congestion. The city government could obtain data about where employees live and where they usually work from the IS used by the organisations. Such large-scale consequences of implementing systems are called *third-order effects*.

2.4.1.2 Effects of competition and oganisational traits

Whether an IS is successful and is able to meet its intended effects is largely dependent on the organisation it is being implemented in and on the competitive environment, culture, structure, the processes the organisation follows, and the IT infrastructure already in place in the organisation.

The *competitive environment* is the competition that the firm faces in the market in which it operates. Often the decision for adopting an IS is based on what competitors are doing and how one can keep up or get ahead of the competition. In the late 1990s many firms across the world adopted e-commerce because that was the means by which they could remain competitive in a rapidly changing environment.

Information systems are often driven by a particular *competitive strategy* that a firm adopts. Firms can often compete by being the lowest cost provider of a good or service. This is a conscious strategy of the firm and they use it to gain market share from their competitors. In such a situation, IS are often used to

further strengthen their competitive position by reducing the cost of their product compared to that of others in the industry.

The *culture* or *work culture* of any organisation is understood as the shared set of values and beliefs within the organisation. The work culture of the organisation shapes the manner in which the IS are both implemented and used and determine what the eventual outcomes of the systems will be. For example, many organisations maintain a competitive culture, where even for internal tasks different groups and departments are expected to compete for assignment. This creates a strong competitive culture within the organisation. Other organisations may follow a different approach, where departments cooperate in team building to tackle the task assignment.

The implementation of IS in an organisation with a competitive culture will have different implications than one in which a cooperative culture exists. In the former, departments or divisions may demand autonomy in using the IS to help them compete better, whereas in the latter a shared, possibly central IS would be welcome.

2.4.1.3 Effects of organisational structure

The structure of an organisation is the manner in which employees are constituted or grouped within the organisation. Many government departments, for instance, are structured as a *hierarchy* where the highest level person has the greatest authority and those reporting to that person are delegated responsibility and authority. For example, in a government department the person at the top of the hierarchy would be a minister and reporting to him/her would be secretaries. Below the secretaries would be joint secretaries and so on, down to the lowest level consisting of office workers. Along with authority, the functions of different people in the hierarchy would also be different, and these functional differences are used to create divisions, departments, and groups within the larger department.

Moreover, many modern organisations use a *matrix structure* where strict hierarchies are not present. Figure 2.2 depicts the hierarchy and matrix organisational structures. Employees are assigned to groups based on projects and tasks they are working on and a reporting structure is established within the group for the duration of the project. As the project terminates, the employees are reassigned to other groups and divisions within the organisation.

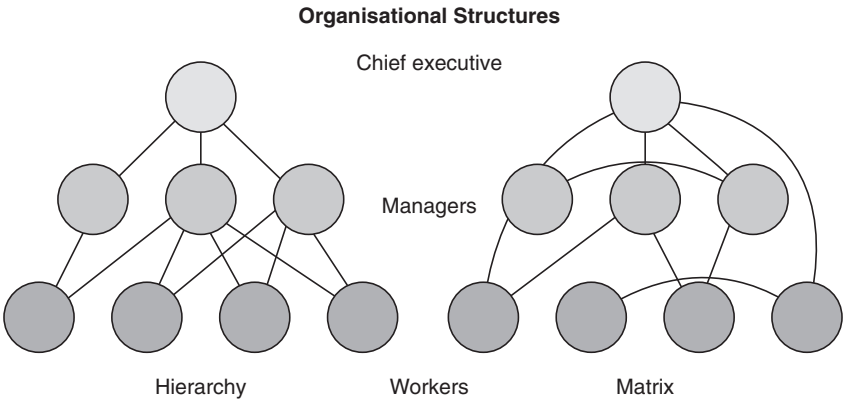

Fig. 2.2: The hierarchy and matrix organisational structures

For information systems to be successful they have to support the existing structure in the organisation. For example, many government departments have implemented *workflow systems* that enable documents to proceed from person-to-person within a department. These documents may need modification or approvals, and so they are moved among personnel who may make changes to them or simply approve their content. The workflow systems move the documents among pre-specified people in the department, according to the structure present in the department. The last person whose approval is usually required for the processing to be complete may be the Minister, and so the system will move the document to the Minister's location only towards the end. The system thus maintains the authority hierarchy of the organisation.

2.4.1.4 Support for organisational processes

Some organisations use information systems to change or challenge the existing hierarchy in place. Workflow systems may alter the manner in which employees receive and process documents, thus helping to introduce efficiencies in the process.

All organisations have internal processes in place to get routine work done. A process is a set of steps required to accomplish a task. For example, many organisations that discharge a marketing function have processes by which they receive and record an order. When an order is received from a customer or placed by a customer, the organisation may record the time and

date at which it has received, the kind and number of goods ordered the person who has initiated the order and the department within the organisation, which has to deal with servicing the order. This process is followed for all orders received.

Organisations create and use processes for all the functions that they perform, such as materials procurement, manufacturing, storage, distribution, marketing, service, etc. Process steps are carefully designed to achieve the goals of a function. The challenge that most managers face is that of having efficient processes that enable them to achieve their goals in the best possible manner.

Information systems (IS) are widely used in organisations to support processes. In the early years of IS use in organisations, the most that IS did was to *automate* many manual processes. For example, the processes related to keeping accounts in an organisation were implemented using a software. This enabled the people in the accounting department to simply enter the correct data and the system would do the needed calculations. Furthermore, the system could also produce reports on various aspects of the accounts, such as balance statements or cost statements, whenever they were needed.

Today modern organisations use IS both to automate existing processes and to add or eliminate processes that will lead to improved overall functioning. Some IS are available for purchase that have pre-built processes and that can be suitably used by organisations. The challenge is to ensure that processes in the purchased IS suit the needs of the organisation.

It is quite likely that when a new system is introduced in an organisation, it has to blend with an already existing IT infrastructure of the organisation. The IT infrastructure consists of the existing hardware, software, and network technologies that are being used by the organisation. The infrastructure also includes the set of policies and practices that the organisation follows while using its IT infrastructure. The new IS have to be designed and implemented in such a manner that it functions within the existing IT infrastructure. For example, if an organisation chooses to introduce a new *customer relationship management* (CRM) system, it has to consider how this system will fit with its existing systems. CRM systems are used widely to maintain details about customers, like their interactions with the organisation, their purchasing and payment details,

their service needs, and other similar details. These systems help in managing customers as all the information related to customers is maintained at a single place. Such systems are very complex and need a careful analysis before they are introduced. They would have to work with existing systems such as financial systems, marketing and sales systems, e-commerce systems, e-mail system, and many others. The manner in which the data in these systems is stored and used has to match that of the new system, and the manner in which the new system would use and modify the data in the existing *legacy* systems also has to be carefully designed.

2.4.1.5 Choosing and implementing information systems

The task of building and implementing information systems (IS) is a difficult and complex one. One of the first decisions organisations have to make is whether to buy the IS from a vendor or whether to build the IS in-house. For many organisations the second choice does not exist as they do not have an in-house team of IS professionals who can build a software. They have to rely on vendors who can take an existing system product from the market and implement it directly or implement it with some modifications to suit the organisation.

The IS implementation process begins with an initiation, or the recognition of a need for an IS. This need arises in the context of a specific problem faced by the organisation or a need to address a future problem. The expressed need is usually based on the competitive position of the organisation, its current structure and culture as well as its current IT infrastructure. For example, an organisation may consider implementing a CRM system because a close competitor has implemented one. The organisation would have to weigh the implications of getting a CRM system in the context of its culture, structure, current processes, and infrastructure.

If the initial need is validated, then this is followed by a detailed process of analysis, where the organisation closely examines the specifics of what it could do with such a system, the cost implications, and the effects that the system could provide. This is followed by a detailed assessment of how the system can be integrated with the current systems already in use, what new training is required, and how processes within the organisation have to be changed to take advantage of the new system. The system is then procured and modified

for the needs identified. The next step is to introduce the system to the organisation's users through training. If there are problems with the new system, as there would invariably be, these are remedied. The system is then slowly integrated with the routine functions of the organisation.

As the new IS are integrated into processes of the organisation, it must invariably undergo changes in its structure, culture, and functioning. As the IS are adopted by the people in the organisation, it begins to have first-order effects, that is, changes in the manner and scope of doing work, and these effects prompt people to imagine how they could further modify the system to better suit their needs. They adjust to the new system along with creating space for more systems.

Information systems and organisations interact in a manner that is dynamic and evolving. It is imperative for managers in organisations to understand the nature of this interaction and prepare to manage in a changing and emerging context.

Self Assessment Questions:

2. _____ order effects arise as a direct consequence of the introduction of information systems in an organisation.

3. A _____ is a set of steps required to accomplish a task and _____ systems are widely used in organisations to support processes for all the functions that they perform.

4. Second-order effects of the introduction of information systems in organisations are designed outcomes that are visible or measurable in the short term. (True/False)

5. Outcomes of the implementation of information systems in organisations are

(a) largely positive

(b) largely negative

(c) positive or negative, depending on how the organisation adapts to the new system

(d) negative in the short term and positive in the long run

6. Managing information systems in organisations is a challenge because

(a) the organisation needs to respond to change in their business and economic environments

(b) the organisation needs to respond to rapid changes in information systems

(c) the organisation itself changes as employees gain more experience with the work environment

(d) all of the above

7. Whether an information system implemented for an organisation is successful depends upon

(a) the culture and the competitive environment of the organisation

(b) the competitive environment and the competitive strategy of the organisation

(c) the culture, the competitive environment, and the competitive strategy of the organisation

(d) the culture, the competitive environment, the competitive strategy, and the structure of the organisation

2.5 Challenges for the Manager

A manager who has to manage an organisation's information systems (IS) faces many challenges. These challenges have to do with the rapid changes that the technology environment faces as well as the myriad issues a modern organisation faces. Managing in a changing and dynamic environment means taking decisions and dealing with issues keeping in mind both the needs of the moment and the issues that will arise in the future.

The issues faced by a modern manager who has to deal with IS are posed as a series of questions below. The perspective from which these questions are posed is that of a *Chief Information Officer* (CIO) of an organisation. A CIO is typically the person in any organisation who has the responsibility of deploying and maintaining IS. This is an executive-level job where the person takes decisions related to

IS throughout the organisation and partners with other executives to ensure that the organisation's goals are met with the help of IS. The CIO is invested with all the responsibilities of high-level executives that include managing all IT personnel in the organisation.

2.5.1 What information systems to build?

This question addresses the fundamental need for an information system (IS) in the organisation. IS serves many purposes and objectives and the manager has to determine which need in the organisation has to be addressed. Identifying and prioritising the need is the first task in answering this question. For example, a firm may want to monitor its sales activities in an on-going manner. The manager has to decide whether the need can indeed be fulfilled by a new IS and, if so, whether the IS should be built.

A complication that arises here is that there could be many different types of IS that address a given need. For instance, there are many types of systems that can keep track of and provide information on sales activities. The challenge for the manager is in determining which system best suits the firm's needs. If the system can be purchased from the market, and there are many vendors who can provide one, then the challenge is to determine which will best suit the firm given its resources. If, however, the firm has an internal IS department then it may choose to build the system on its own.

At a third level, the need for an IS is determined by competitive and organisational considerations. For instance, if close competitors have acquired a sales management system and are deriving significant benefits from it, then it is important for the firm to respond appropriately. Furthermore, the manager has to examine the existing culture, structure and infrastructure of the firm to understand if the new system will fit and in what manner it has to be acquired or introduced.

2.5.2 How much to spend on information systems?

When the need for an information systems (IS) is clear, the next important decision is how much to spend on the system. Systems available in the market will have different prices and capabilities, and systems built in-house by the firm will have their own internal cost estimation. The manager has to decide how much

money has to be allocated for the system and in what manner. This is usually referred to as a budgeting decision.

One answer to this question is obtained by considering how much competitors are spending on similar systems. This information may be available from industry reports or from publicly available financial information. The competitors, who are of the same size and structure and who have built a successful IS with the same capabilities, will provide an indication of how much money to budget for the system. Another answer is obtained from estimating the strategic importance of the system. This answer is computed by gauging the future income the system will provide after it is implemented and then computing a return on investment (ROI). Managers often decide on the worth of an investment by assessing if the ROI is appropriate.

2.5.3 What level of capabilities should be created with information systems?

Managers have to decide the extent of the information systems (IS) they are envisaging. For instance, the questions to be considered for sales of IS are:

1. Should the system support the entire sales and marketing team of the firm or should it support a particular department's activities?
2. Should the system include collecting data from and providing reports to primary sales partners such as distributors and retailers?
3. Should the system be available through the Internet or should it be made available through an internal organisational network?

These questions entail clearly identifying the needs and priorities of the system (as was done in the first question) and weighing these against the budgets available. Managers have to decide against providing excessive capabilities that are not important and will not be used. Also, managers have to keep in mind the issue of scalability. The system will be used initially with certain capabilities, however, as users grow comfortable with the system, they will demand more from the system.

A related decision is whether certain requirements for computing should be outsourced. Outsourcing a function means asking a vendor, another company that has expertise in performing that function, to do the job. The outsourcing vendor may provide employees who work on the firm's site to do the job or they may

work from outside the firm (using network connections to do their work). Outsourcing is an important decision that is covered in detail later.

2.5.4 How centralised should the services be?

An important decision for most large organisations is that of having centralised versus decentralised computing facilities. A centralised facility is a single large IS department that serves all the needs of the organisation and has employees that have the necessary skills to run a large facility. Decentralised systems are those that are maintained and run by other functional departments. For example, for the IS sales discussed above, the firm may decide on a centralised system that is maintained by the IS department, or may ask individual departments or divisions, such as sales or manufacturing to create and maintain their own IS sales.

This decision is important because each choice has different implications for scalability and flexibility. Managing a centralised system is easier, and it can be deployed for many divisions and departments in the organisation. For decentralised systems the advantage is that individual departments have the flexibility to configure the system to suit their special needs and they can also move more rapidly to acquire or change systems.

2.5.5 What security levels are required?

Modern information systems (IS) infrastructures are constantly under threats from internal and external sources. Internal threats arise from employees stealing data or fudging accounts or misusing the systems in some way. External threats arise from computer viruses that enter through the Internet services and disrupt the functioning of systems within the organisation. There are many other kinds of external threats that arise from malicious persons wanting to do damage to the organisation.

An important decision for managers is to ensure an adequate level of safety and security for their IS. Excessive security measures are difficult to work with for most users, as they have to maintain many security-related practices on a regular basis while working with the systems. High security levels are also expensive to maintain. Thus, extensive security is not practical unless the situation demands its implementation. Lax security, on the other hand, leads to problems of data theft, viruses, etc. as discussed above. The best security level has to

be an organisation-wide decision that brings in the security the organisation is most comfortable with.

2.5.6 What is the technology road map for the organisation?

With information technology growing at a tremendous pace, there is a constant challenge that managers face – the challenge of ensuring that their IS remain current, relevant, and useful. For this purpose all managers have to create a technology road map for their organisation. This road map is like a plan for the evolution of the IS in the organisation. The road map considers the current infrastructure as the starting point and shows how the technology is expected to evolve and change in the future and how the organisation will respond to those changes. The road map includes the organisation's strategic goals and plans and creates a technology plan that will support the former.

The technology road map decision includes answering the following example questions:

1. What is the horizon for desktop computers and what will replace them?
2. Which proprietary software in the organisation should be replaced by free and open source software?
3. How should the current enterprise applications be upgraded and expanded?
4. Which of the current networking components being used in the organisation are going to phase out (i.e., they will not benefit from any more development)?
5. What will be the future requirements for networking and telecommunications and how should infrastructure be created?

Self Assessment Questions:

8. The technology road map for an organisation is like an _____ plan of information systems in the organisation.
9. Budgeting for an information system can be arrived at by
   (a) seeing how much competitors spend on similar systems and considering the strategic importance of the system

(b) looking at best-in-class products that meet the requirements of the organisation

(c) gauging the future income the system will provide after implementation and computing a return on investment

(d) all the above means

2.6 Summary

Let us recapitulate the important concepts discussed in this unit:

- The Internet enables many services to run, which include the World Wide Web, E-mail, E-commerce. It also enables new ways of doing business.
- It is necessary for organisations to create a presence on the Internet, which is usually in the form of a site on the Web. Other forms of creating a presence are also used, such as social networking sites.
- A challenge for organisations is to find and use most relevant and useful data. They have to create a presence on the Internet and have to decide whether to use services on the Internet. Though Internet is a boon, it sometimes presents many security challenges.
- Organisations do not remain static; they have to change to respond to the environment. IS too continuously evolves.
- When an organisation builds an information system, the system may be used or not used, which may lead to positive or negative outcomes. Outcomes will have
  - First-order effects: These are the immediate (direct) consequences that arise from the introduction of information systems in organisations.
  - Second-order effects: These are the indirect and more long-term consequences that arise from introducing information systems in organisations.
  - Third-order effects: These are large-scale consequences of implementing systems.
- Whether an IS is successful is largely dependent on

- The competitive environment of the firm.
- The competitive strategy that the firm follows.
- The work culture of the firm.
- The structure of the organisation.

- Information systems may impact the organisation by
  - Changing work processes and functions.
  - Automate manual processes.
  - Eliminate some work processes.
- Building an IS requires choices to be made
  - Build the system, if internal skills are available.
  - Buy the system.
- Initiation requires understanding the need for the IS.
- Analysis is required to understand the specifications for the system.
- A new system has to be introduced and integrated within the organisation.
- A manager who has to manage the IS of an organisation faces many challenges:
  - What systems to build? Choose from many possible needs of the organisation.
  - How much to spend on IS? See what competitors are doing.
  - What level of capabilities should be created with the IS? Support one department or many departments.
  - How centralised should the services be? The systems should be both scalable and flexible.
  - What security levels are required? Security has to be adequate without being cumbersome and expensive.
  - What is the technology road map for the organisation? Plan for the evolution of the IS in the organisation.

2.7 Glossary

Let us have an overview of the important terms mentioned in the unit:

Internet: It is a special kind of digital network that operates on special standards for moving and storing digital data. It is a worldwide collection of networks that share the same standards.

First-order effects: These are the immediate (direct) consequences that arise from the introduction of information systems in organisations.

Second-order effects: These are the indirect and more long-term consequences that arise from introducing information systems in organisations.

Competitive environment: The competitive environment of a commercial firm is the set of buyers, sellers, and rival firms that operate in the market environment of the firm. The firm has to obtain its resources and also sell its products against its rivals to survive in such an environment.

Competitive strategy: The competitive strategy of a firm is the set of long-term measures that the firm takes to survive in the competitive environment.

Culture of an organisation: The culture of an organisation is a shared set of values and beliefs within the organisation.

2.8 Terminal Questions

1. How did information systems evolve?
2. What difference does the Internet make in the way modern organisations operate?
3. Explain first- and second-order effects.
4. How do competition, organisational traits, and structure of an organisation affect success of information systems.
5. Distinguish between hierarchy and matrix organisational structures.
6. What do you understand by support for organisational processes?

7. Briefly explain the challenges faced by a manager managing an organisation's IS.
8. What do you understand by technology road map for the organisation?

2.9 Answers

Self Assessment Questions

1. False
2. First
3. Process, information systems
4. False
5. (c)
6. (d)
7. (d)
8. Evolution
9. (d)

Terminal Questions

1. Refer Section 2.3
2. Refer Section 2.4
3. Refer Section 2.4.1.1
4. Refer Sections 2.4.1.2 and 2.4.1.3
5. Refer Section 2.4.1.3
6. Refer Section 2.4.1.4
7. Refer Section 2.5
8. Refer Section 2.5.6

References and Suggested Reading

- Siler, M., Markus, L., and Beath, C. (1995). The Information Technology Interaction Model: A foundation for the MBA core course, MIS Quarterly, 361–390.

E-References

- More information on Netcraft is available at: http://news.netcraft.com
- More information on Internet World Stats is available at: http://www.internetworldstats.com/stats.htm (accessed on December 2010).