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Information systems management

B. Cox

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Undergraduate study in
Computing and related programmes

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This guide was prepared for the University of London International Programmes by:

Dr Benita Cox

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Introduction

This guide is designed to support study of the subject **318 Information systems management**. This subject is a half unit. The subject guide consists of:

- study notes
- multiple choice questions
- sample examination questions
- a sample examination paper (see Appendix 1).

In this introductory chapter, the following aspects of the subject are covered:

- the subject guide content and structure
- course textbooks and further reading
- guide to effective study
- the examination.

The importance of information systems management

Information systems management is an important subject because it teaches you the management, rather than the technical, principles that you will need to know in order to ensure that an organisation can get the most out of its information systems. The objective of this subject is to provide you with the knowledge that will enable you to make decisions on which information systems to invest in and how to make sure that they are successfully implemented into the organisation.

The subject guide

This subject guide is designed to help you learn. It will identify those issues that are important in this subject. This subject guide is in no way a substitute for the recommended subject textbooks which are detailed below. Rather, it aims to highlight particular areas of study and to provide you with supplementary study material to assist your learning.

The subject guide is divided into sections and chapters, each of which may be viewed as separate but inter-related areas of study. Each chapter is supported by a breakdown of learning objectives and outcomes.

As the focus of this course unit is on management issues, we are concerned here with studying the principle activities of management which are broadly seen as planning, implementation and control. The subject guide is therefore divided into a brief introduction to the subject and then three major sections to reflect each of these activities.

Recommended study time

The recommended minimum study time for this subject is approximately two hours a day for 10 days a month.

Essential reading

Turban, E., D. Leidner, E. McLean and J. Wetherbe *Information Technology for management: transforming organizations in the digital economy.* (Hoboken, NJ: Wiley, c.2008) sixth edition [ISBN 9780471729].

Laudon, K.C. and J.P. Laudon *Management information systems: managing the digital firm.* (Upper Saddle River, N.J.: Pearson/Prentice Hall, 2007) tenth edition [ISBN 0131579843 (pbk)].

Further reading

The following books are suggested as Further reading to broaden your understanding of the issues relating to information systems management.

Earl, M.J. *Management strategies for Information Technology.* (New York; London: Prentice Hall, 1989) [ISBN 9780135516645].

Robson, W. *Strategic management and information systems*. (London: Pitman, 1997) [ISBN 0273615912].

Recommended websites

http://www.brint.com/ (Last accessed July 2009)

http://www.ft.com/home/uk (Last accessed July 2009)

http://www.computerweekly.com/Home/Default.aspx (Last accessed July 2009)

The readings

Although this unit is accompanied by this subject guide, you should read widely on the subject to gain a complete, balanced understanding of the issues as many of the concepts covered in this unit are challenging.

Guide to effective study

The role of this subject guide is to complement the recommended textbooks and suggested Further readings. The subject guide should be regarded as the 'glue' that holds these disparate information sources together. To study this subject effectively, it is important that you fully understand the complementary nature of this study material. In other words, this subject guide is not meant to cover everything that the examination may contain. In fact, the best way to make full use of the complementary nature of this guide is to read it alongside the readings at the start of each chapter.

The guide is mainly concerned with summarising, highlighting or drawing attention to the points covered in a more exhaustive manner in the Essential reading. The guide can therefore help you to concentrate your efforts on the major points and issues in the subject. Throughout the guide you will find reference to specific examples of organisations who have used their information systems in some noteworthy way. It is important that you research these examples yourself. Details of some of the examples will be found in the essential textbooks; for others you will need to conduct your own research to find out the details. You should also remember that information systems management is a dynamic subject and that you therefore need to identify up-to-date examples of appropriate systems.

Assessment exercises

At the end of each chapter, a number of self-assessment exercises are provided. These are in the form of sample examination questions and multiple choice, true or false and 'fill in the gaps' questions. You are advised to complete these self-assessments in order to apply the skills and knowledge you have acquired and to establish how well you have understood the issues and concepts raised during each chapter. Answers to these questions can be found in Appendix 2.

The examination

Important: the information and advice given in the following section is based on the examination structure used at the time this guide was written. However, the University can alter the format, style or the requirements of an examination paper without notice. Because of this we strongly advise you to check the rubric/instructions on the paper you actually sit.

Appendix 1 to this subject guide contains a Sample examination paper. The sample paper is included to give you an idea of the number and type of questions that the examination will include. The examination will contain five questions of which you will be required to answer two. Each question will consist of two parts (a and b) and you will be required to answer **both** parts of the question. You will be given two hours and 15 minutes to answer the examination paper.

Coursework

You will be required to do two pieces of coursework for this subject. The coursework consists of essay type questions. The questions are set at the beginning of each academic year and then sent out to students.

Notes

Section 1 – Introduction

Chapter 1: The evolving role and importance of information systems management in the digital economy

1.1 Introduction

This course unit is concerned with the management aspects of information systems. It is less concerned with technical issues and concentrates on how organisations can get the most out of their information systems by the application of sound management principles. The title of this unit is **Information systems management** – by which is meant:

- the **planning, implementation** and **control** of information systems to enable an informed response to the opportunities of modern information technology.

By an **Information system** we mean:

- the people and procedures that collect, transform, utilise and disseminate information through the use of Information technology. Like other systems it consists of inputs, processes, outputs and feedback loops.

Finally, by **information technology** we mean:

- the hardware, software, communications and other electronic devices which enable these processes to take place.

This chapter describes how the role and importance of information systems management has evolved over the years. It discusses:

- the business drivers which propel organisations to invest in information systems
- how these systems are transforming the ways in which business functions
- how they need to be efficiently managed in order to attain maximum benefit from the investment.

1.1.1 Learning outcomes

By the end of this chapter, the relevant reading and activities, you should be able to:

- discuss the evolving role of information systems management
- describe the business drivers in the digital economy
- discuss the importance of effective management of information systems.

1.1.2 Learning objectives

Your learning objectives for this chapter are to:

- understand how the evolution of information systems technology requires new management approaches
- understand the role of information systems in the digital economy.

1.1.3 Essential reading

Turban, Chapter 1.

1.1.4 Further reading

Laudon and Laudon, Chapter 1.

Carr, N. 'IT doesn't matter', 2003, *Harvard Business Review* 85(5): pp.41–49.

Shrage, M. 'How IT can differentiate your business from the competition', *CIO Magazine*, August, 2003.

1.2 The role of information systems in the digital economy

The rapid advancements in technology have resulted in equally rapid changes in the role of information systems in the digital economy. In recent years we have seen information systems change the way in which the business world functions at various levels.

- At the **international** level – nations use information systems to compete in the international arena.
- At the **industry** level – entire industries are being restructured as a result of the capabilities of information systems.
- At the **organisational** level – whereas in the past information systems supported operational level decisions, they now support decision making at the management and strategic levels as well.
- At the **inter-organisational** level – the ways in which organisations interact with one another has been revolutionised as a result of enabling information and communicating technologies (ICT).
- At the **personal** level – the way in which people go about their day-to-day business as well as their professional lives has changed as a result of ICT.
- At the **interpersonal** level – interpersonal interaction and communication have evolved with the use of ICT.

At the organisational level, the evolution in technology has led to a number of changes in the challenges, opportunities and responsibilities faced by managers. The batch systems which were around in the 1950s and 1960s were managed by the IT department. The major focus for managers of these departments was on the provision of accurate, timely and reliable information. In the mid-1960s, systems moved from being batch to on-line systems. This led to increased business involvement in their management and the challenge became to provide real time information to meet business needs. Further major changes in technology occurred with the arrival of personal computer systems in the 1980s instigating the need to manage the proliferation of end user computing. However, the greatest change in technology has been that of networking. This occurred in the late 1980s requiring both the IT department and senior management to be involved in the provision of appropriate integrated intra and inter-organisational systems. Table 1.4 (p.3) in Turban identifies general developments and trends in technology as well as the development and trends in networked computing.

Whereas the role of early systems was to support the operational activities in the organisation, modern systems are able to transform the ways in which the organisation functions and competes in its environment. Understanding and knowing these developments enables the organisation

to develop appropriate business strategies and responses and to position the business accordingly in the digital economy. Table 1.1 in Turban describes the major characteristics of the digital economy.

1.3 Business drivers of information systems

It is suggested that as much as half of all business investment in the USA each year involves information systems and technologies. It is therefore important to consider the factors that are driving this level of expenditure. Turban suggests that the environmental pressures on organisations to adopt information systems can be divided into **market**, **technological** and **social** pressures.

1.3.1 Market pressures

- **Global economy and strong competition**
  Telecommunications and the internet have shaped the global economy, opening up new market opportunities and enabling organisations to outsource their operations to areas where labour is cheaper.
- **Need for real time operations**
  Decisions need to be made very quickly in the digital economy in order to keep pace with the fast changing business landscape. An organisation needs to be agile in order to respond to these changes.
- **Changing nature of the workforce**
  The workforce is becoming more diverse, with an increase in the number of knowledge workers and an increasing number of teleworkers.
- **Powerful customers**
  Customers are becoming better informed and more demanding as choice and competition increases.

1.3.2 Technological pressures

- **Technological innovation and obsolescence**
  New or improved technologies provide opportunities for differentiated products and services. Others replace existing technologies.
- **Information overload**
  As the amount of information available increases, the only way to handle this information overload is to invest in more technologies.

1.3.3 Social pressures

- **Social responsibility**
  Organisations are under increased pressure to play a responsible role in wider environmental issues such as the control of pollution and care of the environment.
- **Compliance with government regulations**
  Several social responsibility issues are concerned with compliance with government regulations such as laws on privacy and data protection.
- **Terrorist attacks and protection**
  Information systems play a role in identifying potential sources of attack. Organisations are under increased pressure to protect themselves from terrorist attacks.
- **Homeland security**
  Many governments share information which enables them to identify potential cross-border threats and to protect themselves accordingly.

1.4 The importance of effective information systems management

It is clear from the role that information systems perform, and the business drivers which propel them, that they need to be carefully managed and controlled. However, in May 2003 an article written by Nicholas Carr was published in the *Harvard Business Review* entitled 'IT doesn't matter'. The article proposed that, as the core functions of IT are available to all, IT no longer has a scarcity value and therefore is merely a commodity and should be managed as such. In Carr's opinion, information systems are a cost of doing business; all organisations have to invest in these systems; but they no longer provide organisational differentiation (Carr, 2003).

This article led to a great deal of debate in the academic community with many academics arguing against this point. In particular, these arguments suggested that while the technology might, of itself, not be able to achieve a competitive advantage for an organisation, the appropriate management of the information systems could in fact make a difference to an organisation's competitiveness (Schrage, 2003).

Essentially, the argument concerned whether information systems are a source of differentiation. In the 1970s many claims were made, and examples given, of how information systems could provide organisations with a competitive advantage. In the next chapter we will examine the competitive potential of information systems.

A reminder of your learning outcomes

By the end of this chapter, and the relevant reading and activities, you should be able to:

- discuss the evolving role of information systems management
- describe the business drivers in the digital economy
- discuss the importance of effective management of information systems.

Sample examination question

Identify and briefly describe three major IT characteristics in the digital economy.

1.5 Assessment questions

Multiple choice questions

1. Advantages of the new economy's way of doing business over the old way include all of the following **except**:
   A. lower cost
   B. greater speed
   C. IT-based competitive advantage
   D. less convenience.

2. The digital economy has brought about _____ changes in business.
   A. marginal
   B. significant
   C. ethical
   D. planned.

3. Which of the following factors is **not** an example of a major type of business pressure on companies?
   A. Homogenous workforce.
   B. Powerful customers.
   C. Regulatory compliance.
   D. Terrorist attacks and homeland security.

4. The collection of computing systems used by an organisation is broadly termed:
   A. information technology
   B. electronic commerce
   C. value-added network
   D. extranet.

5. The expected benefits of an adaptive enterprise include all of the following **except**:
   A. reduced risk
   B. improved quality of service
   C. reduced total cost of ownership
   D. lower IT infrastructure costs.

True or false

6. Most response activities to competitive pressures can be greatly facilitated by information technology.
7. Information technology (IT) has become the major facilitator of business activities in the world today.

Fill in the gaps

8. A(n) _____ information system is one that provides real-time access to information or data.

9. The _____ enterprise can respond properly and in a timely manner to changes in the business environment.

10. The three principle activities of management are:
    1. _____
    2. _____
    3. _____

Section 2 – Planning

Chapter 2: IT strategy and planning

2.1 Introduction

Planning is deciding what to do before you do it. It is often said that if a business fails to plan, it plans to fail. In business, good planning is an essential element of business success. By planning the future, a business sets out its future objectives together with the resources and actions needed to achieve these objectives. Sometimes a distinction is made between strategic and tactical planning. Strategic planning defines what it is that the business wishes to achieve. Tactical planning defines how the business is going to achieve its strategic plans. As such, strategic planning may be seen as a more visionary and creative process whereas tactical planning contains the detail.

Information systems play an essential role in many aspects of a business. It has been suggested that as much as half the profits of a business may result from closely aligning IT with the business (Luftman, 2003). It is therefore extremely important that planning for information systems is closely linked with business planning. As a result, information systems managers need to know and understand what the business strategy is and to be able to ensure that the information technology can support this strategy.

Defining a strategy is a creative process; it cannot be prescribed. However, a structured approach and the consideration of a number of models can be used to assist in developing a strategy which may be monitored and subsequently updated. Some of the basic elements to include in this strategy are where the organisation wants to be in terms of its IS, where it is now and how to map a path between the two.

In this chapter, we consider planning for an IT strategy to support the business in achieving competitive advantage.

2.1.1 Learning outcomes

By the end of this chapter, the relevant reading and activities, you should be able to:

- discuss the importance of developing an IT strategy
- assess the competitive potential of IT for an organisation.

2.1.2 Learning objectives

Your learning objectives for this chapter are to:

- understand the importance of using information systems to support business objectives
- understand how information systems may be used to enhance an organisation's competitive position.

2.1.3 Essential reading

Turban, Chapter 13.

2.1.4 Further reading

Laudon and Laudon, Chapter 3.

Luftman, J.N., et al. *Managing the information technology resource.* (Upper Saddle River, NJ: Pearson Education, c2004) [ISBN 0131227211].

Earl, M.J. *Management strategies for information technology*. (Prentice Hall International (UK) Ltd., 1989) [ISBN 0135516560 (pbk)].

Porter, M.E. *Competitive advantage*. (New York: Free Press, 2004) [ISBN 9780743260879].

2.1 The competitive potential of information systems

The aim of an organisation is often to have an advantage over the competition. When an organisation is doing better than the competition we call this state of affairs 'having a competitive advantage'.

As early as the 1980s, organisations became aware that information systems could affect their competitive position. Early examples of competitive systems are well-documented and include the SABRE system developed by American Airlines and the Cash Management System developed by Merrill Lynch. More recently we have seen organisations like Dell Computers and Harrah's Entertainment gain a competitive advantage from their information systems. Many other examples exist and are documented in your textbooks and elsewhere.

If information systems assist an organisation to gain a competitive advantage then the IT manager needs to be aware of the business strategies and to ensure that the IT is aligned to these strategies. A number of frameworks are available to assist the manager in brainstorming about the potential strategic application of IT to business problems. These are discussed below.

2.2.1 Generic strategies

In developing its competitive strategy, an organisation will consider what 'thrusts' it plans to use. Michael Porter highlighted three of these thrusts, namely: **cost leadership**, **product differentiation** and **niche strategies** (Porter, 2004).

2.2.1.1 Cost leadership

A cost leadership strategy involves the organisation concentrating its efforts on producing a particular good or service at a lower cost than the competition. This allows it to gain a greater margin per unit or to set lower prices for its products or services in order to attract more customers (e.g.Wal Mart in the US).

2.2.1.2 Differentiation

This strategy involves making the product or service distinct from the competition by giving it some special feature or enhancement that makes it more desirable in the eyes of the customer. This can be either a tangible feature or an intangible one, such as a reputation for high quality (e.g. Dell Computers).

2.2.1.3 Niche

A niche strategy involves the identification of a niche in the market and the tailoring of existing, or the development of new, products to fit that niche (e.g. Saga Holidays).

2.2.1.4 Further generic strategies

More recently, a number of other generic strategies have been added.

- Growth – increase market share, attract more customers or sell more products (e.g. electronic auctions).
- Alliance – collaborate with business partners through joint ventures, alliances, partnerships, etc. This allows organisations to focus on their core competencies. These alliances may be with the organisation's suppliers or may involve a number of organisations in the alliance (e.g. Star alliance).
- Innovation – this is similar to differentiation in that it introduces new products or services but its impact is more dramatic. Innovation suggests that something is so new or different that it changes the nature of the industry (e.g. Citibank's ATMs).
- Entry barriers – these make it difficult for other organisations to enter your market space by introducing innovative products or services (e.g. Cisco's dynamic configuration tool).
- Customer relations – these focus on the needs of the customers. Customer satisfaction is seen as paramount in successful businesses. Creating strong linkages with customers can mean that if they go elsewhere for their product or service they incur switching costs. Encouraging customer loyalty can also be used (e.g. Amazon).
- Core competencies – a core competency is an activity for which a firm is a world-class leader. A competitive advantage may be gained by using information systems to enhance this core competency such as being able to share knowledge across business boundaries.
- Network-based strategies – two network based strategies are network economics and virtual organisations. Information systems networks provide the opportunity for firms to form alliances in innovative ways and establish communities of users which may provide them with a competitive advantage.

2.2.2 Value chain analysis

An important conceptual framework that can help an organisation identify competitive information systems is the value chain developed by Michael Porter (Porter, 2004). It views a firm as a series, or chain, of basic activities that add value to its products and services and thus adds a margin of value to the firm. The value chain divides the firm's activities into those that it must carry out in order to function effectively. Nine value activities are identified. Each of these activities adds value to the final product. In order to be competitively advantaged the business must carry out these activities at a lower cost than its competitors or must use these activities to create a product that is differentiated from those of its competitors and thereby be able to charge a premium price for the product. The nine activities are divided into two categories – primary activities, which are concerned with the direct generation of the organisation's output to its customers, and support activities which contribute to the operation of the primary activities (see Figure 1A.1, Turban p.37).

Michael Earl suggests the scope for exploitation of IT in the value chain is fourfold, applying either technology directly or its information processing capability to either value activities or their linkages (Earl, 1989).

- The technology can physically automate and improve the physical tasks in any activity (e.g. computer controlled machine tools in assembly operations).
- The technology can physically connect or control activities across linkages (e.g. communications linkages between production and distribution centres).
- Information systems can help perform, support or manage value activities (e.g. financial planning, or using information technology to collect information provided by many of the firm's activities to generate forecasts on future performance).
- Information systems can optimise or co-ordinate activities across linkages (e.g. CAD-CAM systems for computer integrated manufacturing).

The key is to ascertain the cost of each activity and to analyse whether there is an opportunity to reduce costs or to add value through IT. An example of how IT systems may support each stage of the value chain for the airline industry is given in Turban (Figure 13.3, p.528).

2.2.3 Five forces of industry competition

The competitive forces model identifies the various external forces which an organisation must balance in order to compete successfully (See Figure 13.2 in Turban on p.523). The model looks at the forces which operate in the particular industry in which the organisation functions. In general, the following forces operate in each industry sector.

- The threat of entry of new competitors.
- The bargaining power of suppliers.
- The bargaining power of customers.
- The threat of substitute products or services.
- The rivalry among existing firms.

The strength of each of these forces will be determined by a number of factors (See Figure 13.2 in Turban, p.523).

The question for the information systems manager is: how can IT influence these forces? An example of how the internet influences industry structure is given in Turban (See Figure 13.2, p.523).

2.2.4 Strategic resources and capabilities

Another strategy an organisation may use to improve its competitive position is to ensure that it has superior resources and capabilities. IT can be used in a number of ways to support this strategy. For example, effectiveness may be increased by using IT to reduce the number of staff an organisation needs to employ by automating some of the tasks. Alternatively, IT may be used to reduce costs by improving efficiency.

Turban discussed the important characteristics of resources for an organisation as value, rarity and appropriability. However, if the organisation wishes to achieve a sustainable competitive advantage (i.e. to maintain its competitive advantage over a prolonged period of time), these characteristics need to be extended to include inimitability, imperfect mobility and low substitutability.

The major ways in which information systems can contribute to these resources is through technology resources, technical capabilities and managerial resources.

A reminder of your learning outcomes

By the end of this chapter, and the relevant reading and activities, you should be able to:

- discuss the importance of developing an IT strategy
- assess the competitive potential of IT for an organisation.

Sample examination question

Discuss two strategies for competitive advantage that are enabled by IT.

2.3 Assessment questions

Multiple choice questions

1. Which of the following does not describe IT strategic alignment?
   A. The alignment of IT and business is the number one issue facing CIOs.
   B. Many IT initiatives have failed because they were not aligned to the business strategy.
   C. Achieving IT alignment is a simple process.
   D. If IT is not properly aligned with the organisation's strategy, then large investments in IS can have a low payoff.

2. Which of the following is not a key factor in getting and keeping IT aligned with the organisation?
   A. The CIO having strong relationships with other senior executives.
   B. Treating end users as customers.
   C. The IT department has good relationships with end user departments.
   D. Introducing new IT as a competitive weapon.

3. One way to analyse the strategic potential of information systems is to consider their influence on one or more forces in Porter's competitive forces model. Which of the following is not one of those forces?
   A. Bargaining power of customers.
   B. Rivalry among existing firms in the supply chain.
   C. Threat of substitute products or services.
   D. Threat of new entrants.

4. Which of the following is not a way the internet changes the structure of an industry?
   A. Reducing barriers to entry, such as the need for a sales force, access to channels, and physical assets.
   B. Reducing switching costs, such as switching buyers.
   C. Lowering fixed cost relative to variable cost, increasing pressures for price discounts.
   D. Reducing the leverage of intervening companies because the internet provides a channel for suppliers to reach end users.

5. For firms in the same industry, critical success factors (CSFs) will vary depending on each of the following **except***:*
   A. whether the firms are market leaders or weaker competitors
   B. where the firms are located
   C. what competitive strategies they follow
   D. the IT architectures.

6. Which of the following is a barrier to entry?
   A. Retail banking: the cost for a customer in moving accounts to a different bank.
   B. Airline industry: the cost of aircraft fuel.
   C. Food retailing: the cost for a supermarket chain in changing suppliers.
   D. Shipbuilding: the cost of an up-to-date construction facility.

7. How can the internet change the structure of an industry?
   A. Shift bargaining power away from end customers.
   B. Widen the geographic market, increasing the number of competitors.
   C. Increase differences among competitors as offerings are difficult to keep proprietary.
   D. Reduce competition based on price.

True or false

8. The internet greatly decreases the bargaining power of customers or buyers in the market.
9. A study of chief information officers (CIOs) sponsored by the Society for Information Management found that the number one issue facing CIOs was the alignment of IT and business.

Fill in the gaps

10. Airlines in global alliances such as OneWorld and Star Alliance compete for ticket sales on some routes, but once the ticket is sold they may co-operate by flying passengers on competitor's planes to avoid half-full planes. This is an example of _____.
11. _____ has been widely used by major corporations to facilitate IT planning that involves much uncertainty. It also has been particularly important to e-commerce planning.
12. When a company selects a narrow-scope market segment and attempts to be the best in that market, the company has a _____ strategy.
13. By offering different and 'better' products, companies can charge higher prices, sell more products, or both. These are benefits of the _____ strategy.
14. The _____ model is useful in conducting a company analysis, by systematically evaluating a company's key processes and core competencies.
15. _____ are the things that must go right in order to ensure the organisation's survival and success.

Notes

Chapter 3: Formal planning techniques

3.1 Introduction

The previous chapter highlighted the importance of ensuring that the plan for the information systems fits in with the organisation's overall plan and strategy. It focused on one aspect of alignment; namely, providing information systems in order to assist the organisation in achieving a competitive advantage. This chapter looks more broadly at planning for information systems. It emphasises once again the importance of aligning information systems to the business objectives at all levels – both internally and externally – and considers a number of techniques and frameworks to assist in this process.

3.1.1 Learning outcomes

By the end of this chapter, the relevant reading and activities, you should be able to:

- discuss the importance and challenges of aligning information systems and business objectives
- describe the various components of an information systems plan
- describe the personnel involved in information systems planning
- describe how to formulate an information systems plan
- describe the frameworks available to support the planning process
- discuss interorganisational information systems planning
- discuss multinational information systems planning.

3.1.2 Learning objectives

Your learning objectives for this chapter are to:

- understand the importance of aligning IS strategy and business objectives
- understand the components of an information systems plan
- understand the methodologies available to facilitate IT planning.

3.1.3 Essential reading

Turban, pp.531–542.

3.1.4 Further reading

Laudon and Laudon, p.388.

3.2 IT strategic alignment

The failure of many information systems projects is seen to result from a failure to align the business objectives with the information systems' objectives. In determining the information systems strategy, managers should consider aligning the IS function's strategy, structure, technology and processes with those of the business units so they are working to achieve the same goals.

Strategic alignment is challenging as it requires a clear understanding of the business strategy (where the business is going), the IS strategy (what is required) and the IT strategy (how it can be achieved). See Figure 13.1 on p.521 in Turban which illustrates this relationship.

3.3 Components of an information systems strategy

There are a number of components which are typically included in an IS plan. These include:

- a statement of the business strategy
- a statement of the current systems
- proposed new developments
- management strategies
- implementation strategies for the IS plan
- resource requirements.

3.4 Personnel involved in information systems planning

If information systems are to be aligned with the business objectives then it is important that the personnel involved in developing the plans are drawn from both the IT department and from other business functions. The team should therefore be made up of:

- specialist planning staff
- general information systems' staff
- a coalition team drawn from a number of business functions.

3.5 Formulating an information systems strategy

Information systems planning has evolved over the years. In the early years, planning mainly considered how information systems could support the operational level of the business. Over time, as the technology became more sophisticated, the emphasis shifted to providing IT support for management decision making. Since the 1990s, the focus has been on how IT can support the business in achieving its business goals.

A structured approach and models may be used to assist in developing the information systems strategy, which may be monitored and subsequently updated. Some of the basic elements to include in this strategy are: where the organisation wants to be in terms of its IS; where it is now; and how to map a path between the two. Top down planning techniques are used to determine where the organisation wants to be in terms of its future information systems. Bottom up planning helps the organisation to understand where it is now in terms of its current information systems.

3.6 Tools and methodologies for IT planning

There are several tools, methodologies and frameworks available to assist an organisation in determining its IS Strategy. Some of these are discussed below.

3.6.1 Top down planning

3.6.1.1 The business systems planning model

This is a top down approach to information systems planning. It proposes the identification of business plans and goals, followed by deduction of information systems needs using an analytical approach with inputs from management at various levels.

Top down planning asks the following questions:

- What are the aims, objectives and goals of the business?
- What information systems are needed to support these aims, objectives and goals?

It proposes a business perspective describing:

- the business strategy, in terms of the internal and external environment
- the key figures, such as customers, suppliers, competitors, etc.
- the information needs derived from the analysis of the business environment
- a description of the potential use of IT in the business area.

Business systems planning is a specific example of top down planning that considers the business processes, and derives the data classes to support these processes, which become the building blocks of the information architecture. The information architecture is then used to determine the organisational database requirements and applications. (See Figure 13.4 in Turban on p.533).

3.6.1.2 Critical success factors

Identifying critical success factors is also an example of a top down planning technique. It is a well-known and widely used business planning technique. Critical success factors are the limited number of things which the business must do right in order to be successful. There should be no more than six such factors. The business starts by identifying its highest level aims, objectives and goals and then identifies the factors which are critical to achieve these aims. The IT manager then determines the information systems needed to help and support the business in achieving these critical success factors. For example, if the business aim is to have excellent customer satisfaction, the critical success factors may include: excellent staff, fast customer response times, etc.

3.6.1.3 Scenario planning

Scenario planning is used in situations where the future is uncertain. For example, it may be used to try and determine future customer requirements. The planners create a scenario and then consider how potential changes in future events or requirements may impact on this scenario. This type of planning has been particularly important in e-commerce planning. The typical steps in scenario planning are set out in Turban on p.536.

3.6.2 Bottom up information systems planning

In planning what information systems will be needed in the future, account must also be taken of the systems which are already in place. Bottom up information systems planning audits the current position of the information systems. It addresses questions such as the following.

What is the coverage of existing systems?

Examination of current systems may suggest either that some could already be better exploited for business purposes, such as gaining strategic advantage, or be built upon to yield significant added value.

What is the business value of our existing systems?

This question needs to be asked of the business users to ascertain their view on the value of the information system to the business.

What is the technical value of our existing systems?

This question is asked of the technical staff and assesses how good the system is technically (e.g. how reliable is it)? How user-friendly is it?

The systems audit grid (or 'evaluation grid') represents an appraisal framework for the current systems. The horizontal axis considers the technical conditions of a system, while the vertical axis provides a view of the business value of the system. Prescriptive actions are then suggested on the basis of these assessments.

If the system is rated by both business and technical users as being of low quality, it should be eliminated. If the system is rated highly by business users but poorly by technical experts, it is a risk to the business and should be renewed. If the system is high on technical quality but low on business value it needs to be reassessed before getting rid of it. For example, it may be that it could be enhanced to provide business value by adding some functionality. It should be remembered that where a system is rated highly by both technical and business people, it should be maintained and potential enhancements should be considered.

3.7 Interorganisational IT planning

In recent years, we have seen major increases in the number of interorganisational systems. IT planning may get more complex when there is more than one organisation involved. Some interorganisational systems may involve thousands of partners. IT planners may use customer, supplier or other business partner focus groups to help them determine requirements. Virtual planning teams may be created to work together and the partners may adopt the same enterprise software.

3.8 IT planning for multinational corporations

Multinational corporations have to deal with the different legal, political and social issues which operate in the various countries in which they are represented. In many instances, it may therefore be appropriate to decentralise their IT planning to be dealt with at a local level.

3.9 Resource allocation

The end result of the planning process will be the future information systems requirements for the organisation. In order to implement these requirements, resources will be needed. Obtaining resource within an organisation is typically a competitive issue. As there are invariably insufficient resources to meet all the organisation's requirements, the IT department will be bidding against other departments to obtain funding. In some instances the need to invest in IT is clear-cut (such as when infrastructure investments are needed and the funding for the IT department's requirements will almost certainly be met). However, in other circumstances the IT department will have to make a case for obtaining the funding. In some cases the IT department may recoup some of its costs by using a chargeback system where some or all of the cost incurred is charged to users.

3.10 Difficulties of IT planning

Planning is a time consuming and resource-intensive process. Many organisations argue that by the time the plan is complete, the technology has evolved and the plan is obsolete. Other difficulties are getting the correct personnel involved, difficulties in aligning business and IT goals, changing requirements, etc.

3.11 E-planning

E-planning differs from IT planning in that it is more concerned with planning applications to exploit business opportunities rather than planning infrastructure. It is also frequently conducted more quickly and less formally. Planning for individual applications is similar to other IT planning. However e-planning may also involve planning a portfolio of applications. Tjan describes a portfolio strategy for planning e-applications (this is described on p.541 of Turban).

A reminder of your learning outcomes

By the end of this chapter, the relevant reading and activities, you should be able to:

- discuss the importance and challenges of aligning information systems and business objectives
- describe the various components of an information systems plan
- describe the personnel involved in information systems planning
- describe how to formulate an information systems plan
- describe the frameworks available to support the planning process
- discuss interorganisational information systems planning
- discuss multinational information systems planning.

Sample examination question

Do you think that IT planning is justified?

3.12 Assessment questions

Multiple choice questions

1. Porter's five forces model can be generalized to include all but which of the following?
   A. Innovation, growth, alliance and time.
   B. The threat of new competitors
   C. The bargaining power of suppliers.
   D. The bargaining power of customers.
   E. The threat of substitute products or services.

2. The success of IT steering committees largely depends on _____, which is a formal set of statements and policies for IT alignment, level of acceptable risk, and allocation of resources.
   A. an IT tactical plan
   B. an application portfolio
   C. IT governance
   D. IT imitability.

3. Which of the following is not a characteristic of critical success factors (CSF)?
   A. The CSF approach to IT planning helps identify the information needs of managers.
   B. CSFs are numerous things that must go right to ensure the organisation's survival or success.
   C. CSFs exist in business units and departments as well as in the organisation.
   D. CSFs vary by broad industry categories, such as manufacturing, service, or government.

4. For firms in the same industry, critical success factors (CSFs) will vary depending on each of the following **except***:*
   A. whether the firms are market leaders or weaker competitors
   B. where the firms are located
   C. what competitive strategies they follow
   D. the IT architectures.

5. Which of the following is not a key factor in getting and keeping IT aligned with the organisation?
   A. The CIO having strong relationships with other senior executives.
   B. Treating end users as customers.
   C. The IS department having good relationships with end user departments.
   D. Introducing new IT as a competitive weapon.

True or false

6. A study of chief information officers (CIOs) sponsored by the Society for Information Management found that the number one issue facing CIOs was the alignment of IT and business.
7. American Airlines' reservation system, SABRE, and Caterpillar's equipment maintenance system, are examples of innovative supersystems. A drawback of these and other supersystems is that they are expensive and easy to duplicate.

Fill in the gaps

8. The _____ committee is a group of managers and staff representing various organisational units that establishes IT priorities and ensures that the IS department is meeting the firm's needs.
9. _____ has been widely used by major corporations to facilitate IT planning that involves much uncertainty. It also has been particularly important to e-commerce planning.
10. _____ consists of developing the hardware, software, data communications and networks, facilities, personnel and financial plans needed to execute the master development plan as defined in the requirements analysis.

Appendix 2: Answers to assessment exercises

Chapter 1

Sample examination question – key points

Candidates could elaborate on three of the following points.

Globalisation: Global communication and collaboration; global electronic marketplaces; global customers, suppliers and partners.

Digital systems: From TV to telephones and instrumentation, analogue systems are being converted to digital ones.

Speed: A move to real-time transactions, thanks to digitised documents, products and services. Many business processes are expedited by 90 per cent or more.

Information overload: Although the amount of information generated is accelerating, intelligent search tools can help users find what they need.

Markets: Markets are moving online. Physical marketplaces are being replaced by electronic markets; new markets are being created, increasing competition and market efficiency.

Digitisation: Music, books, pictures, films and other media are digitised for fast and inexpensive distribution.

Business models: New and improved business models and processes provide opportunities for new companies and for innovative processes and industries.

Innovation: Digital and internet-based innovations continue at a rapid pace. More patents are being granted than ever before.

Obsolescence: The fast pace of innovations creates a high rate of obsolescence.

Opportunities: Opportunities abound in almost all aspects of life and business.

Fraud: Criminals employ a number of innovative schemes on the internet. Cybercons are everywhere.

Wars: Conventional wars are changing to cyberwars which are found over the internet.

Assessment questions

1. D
2. B
3. A
4. A
5. D
6. True
7. True
8. Real time
9. Adaptive
10. Planning, implementation and control.

Chapter 2

Sample examination question – key points

See Turban, pp.524, 546 and 547.

Assessment questions

1. D
2. B
3. C
4. D
5. B
6. B
7. E
8. True
9. True
10. Alliance strategy
11. Scenario planning
12. Niche
13. Differentiation
14. Value chain
15. Critical success factors.

Chapter 3

Sample examination question – key points

There is no single right or wrong answer to this question. Some points that may be made are that planning is a waste of time as it takes too long and by the time that the plan is ready for implementation the world has moved on and the plans are obsolete. It is also expensive to undertake formal planning. On the other hand, it may be argued that planning provides a roadmap of where the organisation is going and provides milestones to see whether objectives have been achieved. It also helps to align IT and business strategies. Planning should be done in a flexible way so that the plans may alter as appropriate with the changing environment.

Assessment questions

1. A
2. C
3. B
4. D
5. D
6. True
7. False
8. Corporate steering
9. Scenario planning
10. Resource allocation.