



THE E-BUSINESS DOMAIN

The power of technology as a competitive variable lies in its ability to alter competition through changing industry structure.

Michael Porter

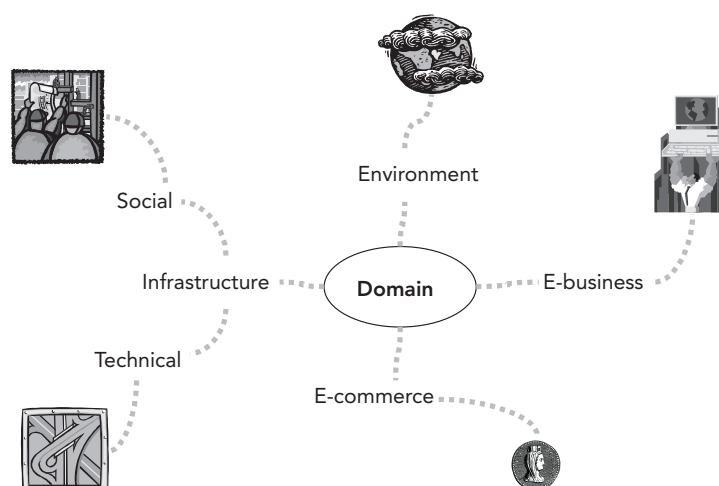
Practical men who believe themselves exempt from any intellectual influence, are usually the slaves of some academic scribbler of a few years back.

John Maynard Keynes

LEARNING OUTCOMES

After reading this chapter, you will be able to:

- Distinguish between e-business and e-commerce
- Discuss the major elements in the environment of e-business
- Describe the major forms of e-commerce
- Relate the major features of the technical infrastructure for e-business
- Outline the major features of the social infrastructure for e-business



1.1  INTRODUCTION

Over a number of decades economic markets globally have been subject to two inter-dependent trends – the increasing centrality of information to effective activity and the increasing reliance on electronic communication networks for effective information transfer. Not surprisingly, many contemporary markets are electronic markets or e-markets – markets in which economic exchanges are conducted in whole or part using information and communications technology (ICT). The activity within electronic markets is generally referred to as electronic business (e-business) or electronic commerce (e-commerce). In this chapter we shall distinguish between these terms and use a model to discuss the key elements of e-business as a domain.

The eminent British scientist Michael Faraday once gave a tour of his laboratory to the then Prime Minister. He was asked what use the discovery of electricity could possibly have. ‘I cannot say’, Faraday replied, ‘but one day Her Majesty’s government will tax it’.

Prediction of the impact of technology is a tricky business. A key question frequently asked in relation to this area is how much will e-business revolutionise business? The opening sentence of this chapter should make it clear that this question somewhat misses the point. E-business has been happening for the last twenty to thirty years in terms of the use of ICT to change internal business practices. A much more valid question is how much e-commerce will revolutionise trade. Although e-commerce has impacted upon business-to-business trading, the case is still out as to its impact on customer-to-business and customer-to-customer relationships. The key aim of this book is to provide the reader with sufficient understanding to make an informed judgement about this fundamental question.

A note of caution: this chapter summarises the fundamental theory needed to understand the phenomenon of e-business. We would agree with Kurt Lewin that *there is nothing more practical than a good theory*. Therefore the current chapter serves as an orienting map for the book, since it provides a high-level view of the e-business terrain and provides the structure for the major parts of the text that follow. The reader is not expected to assimilate all the concepts discussed here in one pass, but should feel free to follow links to further chapters at any time. The chapter can be used at some later point as a way of reviewing the material covered.

Example

A major study (Dutta and Bison, 2001) of the effect of the Internet on large global corporations (listed in the *Fortune* Global 500 list) since 1997 concludes that:

- All large corporations have progressed in terms of establishing a presence on the Internet from a baseline of 50% of companies in 1997.
- The proportion of companies using the Internet for e-commerce has increased significantly. Initially most companies used the Internet as an advertising medium. Companies are now gradually enlarging their activities to handle commercial transactions.
- Most corporations have moved their existing business operations onto the Internet with little change to their fundamental business models.

- US corporations have been leading the business world in the use of the Internet. European corporations have gained the most ground in general advancement. Asian corporations continue to lag behind in e-business.

1.2 ELEMENTS OF THE E-BUSINESS DOMAIN

The model in Figure 1.1 depicts the major elements of the e-business domain and also forms the basic structure for the book. Each of the component elements contained in the model is covered in more detail as a part of the book:

- *E-business environment (Part 3)*. A number of transformations in the economic, social and political spheres form the backdrop for organisational change stimulated by ICT in both the public and private sectors.
- *E-business (Part 1)*. We shall argue that e-business is both an old and a new phenomenon. It is an old phenomenon in that ICT has been used to innovate internal changes in business for a number of decades. It is a new phenomenon in that ICT is being used to innovate new forms of trading behaviour.

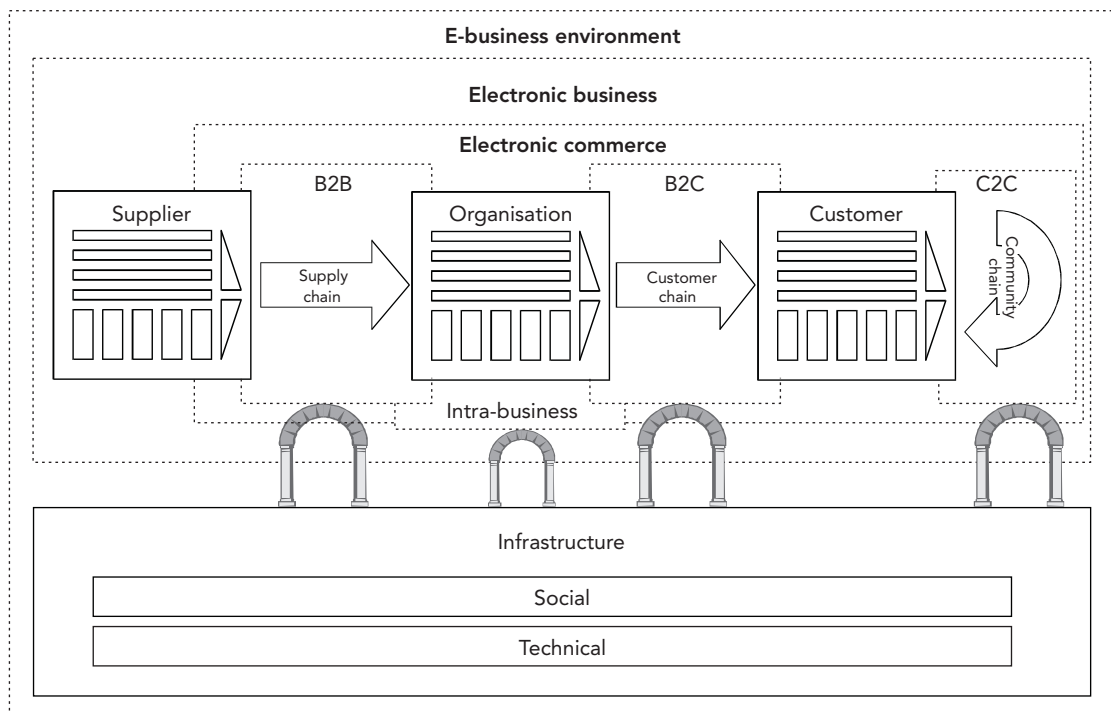


Figure 1.1 A model of the e-business domain.

- *E-commerce (Part 4)*. The model distinguishes between three forms of e-commerce. Business to business e-commerce is one of the older and more established forms of ICT innovation in the area of trade. Business to consumer e-commerce has been critically affected by the rise of the Internet and the Web. Consumer to consumer e-commerce is probably the most radical and recent form of ICT innovation in the area of commerce.
- *E-business infrastructure*. The arches on the model presented in Figure 1.1 are meant to represent the important role that infrastructure plays in supporting e-commerce and e-business. We distinguish between social infrastructure and technical infrastructure. Social infrastructure refers to the necessary processes of planning, management, development and evaluation that must occur within organisations if they are to be successful in e-business (Part 5). Technical infrastructure refers to the necessary arrangements of information and communication technologies that make e-business possible (Part 2).

At the start of each part of the book this diagram is revisited with the appropriate component element highlighted for consideration. Within this chapter we consider each of these elements in turn, then summarise the interrelationships between the components.

1.3 E-BUSINESS (PART 1)

There has been some debate about the distinction between the terms *e-business* and *e-commerce*. We take e-business to be a superset of e-commerce. In turn, e-commerce can be considered a superset of Internet commerce or i-commerce:

- *E-business*. Business can be considered either as an entity or as the set of activities associated with a commercial organisation. Electronic business or e-business might be defined as the utilisation of information and communication technologies to support all the activities of business.
- *E-commerce*. Commerce constitutes the exchange of products and services between businesses, groups and individuals. Commerce or trade can hence be seen as one of the essential activities of any business. E-commerce focuses on the use of ICT to enable the external activities and relationships of the business with individuals, groups and other businesses.
- *I-Commerce*. Internet commerce is the use of Internet and Web technologies to enable e-commerce. Such technologies are becoming the key standards for intra- and inter-organisational communication.

These distinctions allow us to delineate the use of ICT to enable communication and coordination between the internal stakeholders of the business (intra-business e-business) such as employees and managers from the use of ICT to enable communication and coordination with external actors (e-commerce) such as suppliers, partners and customers.

1.3.1 SYSTEM

We use one fundamental and multi-faceted concept to explain e-business issues – that of a system. A systemic analysis of e-business corresponds to a holistic account of this phenomenon. We take e-business to be fundamentally concerned with the way in which various social and technical systems interact within the business. The systems concept is important because it allows us to relate together a number of critical concerns for e-business: the structure and dynamics of organisation – the issues of control and performance, management and decision-making, data and information, and activity and technology.

E-business is founded in systems (Chapter 2): systems of human activity, systems of information, and systems of information and communication technology. A system might be defined as a coherent set of interdependent components that exists for some purpose, has some stability, and can be usefully viewed as a whole. Systems are generally portrayed in terms of an input–process–output model existing within a given environment (Figure 1.2). The environment of a system might be defined as anything outside the system that has an effect on the way the system operates. The environment of a system can be defined in terms of the agents or agencies with which the system interacts. The inputs to the system are the resources it gains from agencies in its environment. The outputs from the system are those things that it supplies back to agencies in its environment. Inputs and outputs may be composed of either data or physical items. The process of the system is that set of activities that transform system inputs into system outputs. Systems can also be viewed hierarchically as a collection of subsystems and sub-subsystems....

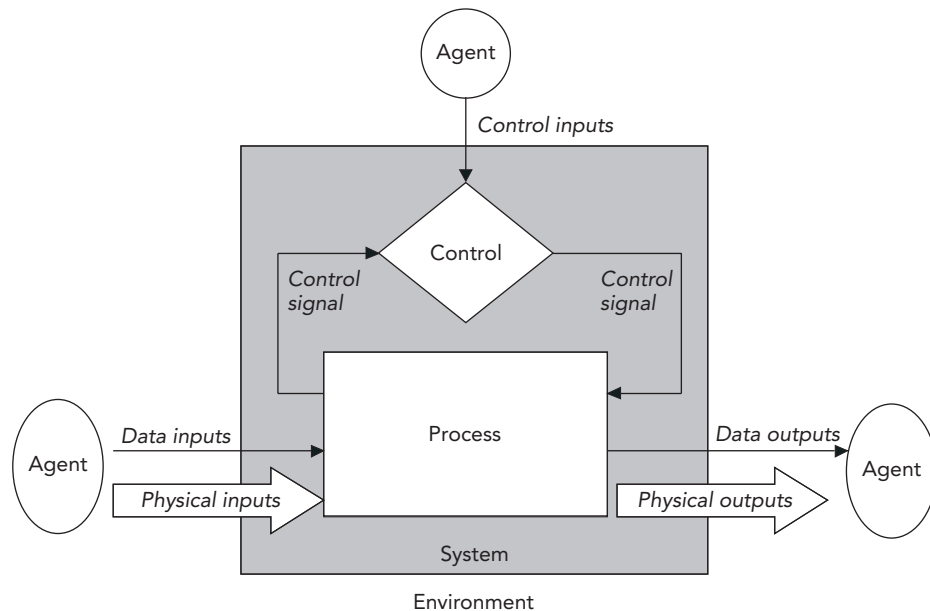


Figure 1.2 System components.

The systems concept has been applied to technology (ICT system), to information (information system) and to human activity (human activity system).

1.3.2 HUMAN ACTIVITY SYSTEM

Organisations, particularly business organisations, are human activity systems (Chapter 3) or more realistically complex chains of human activity systems. A human activity system (HAS) is a social system – sometimes referred to as a ‘soft’ system – and comprises a logical collection of activities performed by some group of people. A human activity system will have a distinct goal or goals that it fulfils. Another term now used as a synonym for a HAS is *organisational or business process*.

Organisations can be conceived of as chains of human activity systems associated with the production and dissemination of value. For commercial organisations such value will typically constitute products. For public sector organisations value will typically be embodied in the services that such organisations provide. Within the community value will constitute social capital – networks of information, trust and reciprocity.

1.3.3 VALUE CHAINS AND E-BUSINESS

Organisations can be seen as consisting of a series of interdependent chains made up of interdependent human activity systems that deliver value (Chapter 3). Four chains are significant for most businesses:

- The *internal value chain* consists of a series of HAS by which the organisation produces value.
- The *supply chain* consists of those HAS by which an organisation obtains goods and services from other organisations.
- The *customer chain* consists of those HAS by which an organisation delivers value to its customers.
- The *community chain* consists of those HAS in the ‘community’ that support value generation between individuals and groups.

Fundamentally e-business and e-commerce focus around organisational value chains. The trend to use ICT to re structure aspects of the internal value chain of organisations has been ongoing for a number of decades. Recently increasing interest has been expressed in using ICT to re-engineer aspects of the organisation customer and supply chains. ICT is also being used to build bridges between an organisation and the larger community.

Every human activity system within internal and external value chains will rely on information for effective collaboration and coordination of activity. Information will be supplied by associated information systems. ICT systems are an inherent part of most contemporary information systems.

1.3.4 INFORMATION AND INFORMATION SYSTEMS

Information is data interpreted in some meaningful context. A datum, a unit of data, is one or more symbols that are used to represent something. Information is interpreted data. Information is data placed within a meaningful context. The use of the term information therefore implies a group of people doing interpretation. An information system is a system of communication between people. Information systems are systems involved in the gathering, processing, distribution and use of information. Information systems support human activity systems in the sense that information is important for the coordination of human activity to meet established goals.

1.3.5 CONTROL AND PERFORMANCE

Control is the mechanism that implements regulation and adaptation in most systems. Systems generally exhibit some form of control to maintain the systems in some form of equilibrium and to enable the system to adapt to changes in its environment. Control can be viewed in terms of a monitoring subsystem that regulates the behaviour of other subsystems (Figure 1.2). This monitoring or control subsystem ensures defined levels of performance for the system through imposing a number of control inputs upon the system.

A monitoring subsystem may only work effectively if there are defined levels of performance (Chapter 2) for the system. Such performance levels will be defined by higher-level systems – a super-system for some given system. There are three main types of performance measure: efficacy, efficiency and effectiveness measures (Checkland, 1987):

- *Efficacy*. Efficacy is a measure of the extent to which a system achieves its intended transformation.
- *Efficiency*. Efficiency is a measure of the extent to which the system achieves its intended transformation with the minimum use of resources.
- *Effectiveness*. Effectiveness is a measure of the extent to which the system contributes to the purposes of a higher-level system of which it may be a subsystem.

Performance management of all three types is required for e-business. Information is critical to the measurement of performance in all three areas. The control signals on Figure 1.2 are fundamentally flows of information between the monitoring subsystem and its monitored process. Such signals feed back to the monitoring subsystem and trigger actions to maintain the state of some system within given bounds. In such terms, information systems and ICT are therefore critical for the effective management of modern organisations.

1.3.6 INFORMATION AND COMMUNICATION TECHNOLOGY

Information and communication technology (ICT) is any technology used to support information gathering, processing, distribution and use. ICT provides a

means of constructing aspects of information systems, but is distinct from information systems. Modern ICT consists of hardware, software, data and communications technology.

- *Computer hardware.* This comprises the physical (hard) aspects of ICT, consisting of processors, input devices and output devices.
- *Computer software.* This comprises the non-physical (soft) aspects of ICT. Software is essentially programs – sets of instructions for controlling computer hardware.
- *Data.* This constitutes a series of structures for storing data on peripheral devices such as hard disks. Such data is manipulated by programs and transmitted via communication technology.
- *Communication technology.* This forms the interconnective tissue of ICT. Communication networks between computing devices are essential elements of the modern ICT infrastructure of organisations.

It is important to recognise that information systems have existed in organisations prior to the invention of ICT, and hence ICT is not a necessary condition for an IS. However, in the modern, complex organisational world most IS rely on hardware, software, data and communication technology to a greater or lesser degree because of the efficacy, efficiency and effectiveness gains possible with the use of such technology.

1.3.7 ICT SYSTEM

An ICT system is a technical system. Such systems are frequently referred to as examples of ‘hard’ systems in the sense that they have a physical existence. An ICT system is an organised collection of hardware, software, data and communication technology designed to support aspects of some information system. An ICT system has data as input, manipulates such data as a process and outputs manipulated data for interpretation within some human activity system. Hence most ICT systems are concerned with data manipulation or processing.

It is useful to consider an ICT system as being made up of a number of subsystems or horizontal layers:

- *Interface subsystem.* This subsystem is responsible for managing interaction with the user. This subsystem is generally referred to as the user interface, sometimes the human–computer interface.
- *Rules subsystem.* This subsystem manages the logic of the ICT system in terms of a defined model of business rules.
- *Transaction subsystem.* This subsystem acts as the link between the data subsystem and the rules and interface subsystems. Querying, insertion and update activity is triggered at the interface, validated by the rules subsystem and packaged as units (transactions) that will initiate actions (responses or changes) in the data subsystem.
- *Data subsystem.* This subsystem is responsible for managing the underlying data needed by the ICT system.

In the contemporary ICT infrastructure each of these parts of an application may be distributed on different machines, perhaps at different sites. This means that each part usually needs to be connected together in terms of some communications backbone.

1.3.8 INFRASTRUCTURE

Organised activity of whatever form requires infrastructure (Chapter 5). Infrastructure consists of systems of social organisation and technology that support human activity (Ciborra *et al.*, 2000). The arches on Figure 1.1 are meant to indicate that the technical and social infrastructures support activity in key areas of e-business. It thus becomes possible to speak of four vertical layers of infrastructure crucial to e-business:

- *HAS Infrastructure*. This constitutes the organisation of activity supporting the creation and distribution of value.
- *Information infrastructure*. This comprises the information necessary to support the HAS infrastructure.
- *Information systems infrastructure*. This consists of the information systems needed to support organisational activity in the areas of information collection, storage, dissemination and use.
- *ICT infrastructure*. This consists of the hardware, software, communication facilities and ICT knowledge and skills available to the organisation.

Such layers are organised hierarchically. The information infrastructure supports the HAS infrastructure. In turn, the information infrastructure is supported by the IS infrastructure. Finally, it is likely that the IS infrastructure of an organisation will be supported by an ICT infrastructure. We use the term *informatics* to encompass issues of information, information systems and ICT. Hence we may simplify and state that the human activity systems infrastructure of an organisation is reliant on its informatics infrastructure.

It is also possible to think of infrastructure in terms of a horizontal division between those processes and technologies concerned with external activities and those processes and technologies associated with internal activities. The former is frequently referred to as the front end or front office of the organisation. The latter is often referred to as the back end or back office of the organisation.

1.3.9 MANAGEMENT AS CONTROL

Information supports human activity in the sense that it enables decisions to be made about appropriate actions in particular circumstances. Decisions and decision-making therefore mediate between information and action and are a critical aspect of any human activity system.

Management can be seen as a control process within organisations. Management is a human activity system that controls other human activity systems. The

primary activity of management is making decisions concerning organisational action. Effective management decision-making is reliant on good information, the effective definition of performance and the construction of effective performance management systems for managerial activity. Transactional data is critical to performance management.

1.3.10 TYPES OF INFORMATION SYSTEM

In terms of the control processes of organisations it is possible to distinguish between three major types of information system: transaction processing systems (TPS), management information systems (MIS) and decision support systems (DSS)/executive information systems (EIS).

Transaction processing systems form the major back-end information systems of the business and include sales order processing, purchase order processing, stock control, payroll and accounting. Such systems handle most of the essential operational information needed for running the business.

On this foundation a large number of other information systems are normally built. Such systems are front-end systems in the sense that they directly interface to the major stakeholder types of business: managers, employees, suppliers and customers (Chapter 4).

Various information systems may feed off the data provided by core information systems in the back-end infrastructure and summarise such data for effective management and planning. In effect this is a vertical extension to the back-end information systems infrastructure. These are the management-facing information systems of the business.

Extensions may also be made horizontally out from the core information systems of the business. Connections may be made from the core IS infrastructure to other information systems that interface to a company's customers, suppliers or employees. Such are the customer-facing, supplier-facing and employee-facing information systems of the business (Chapter 5).

1.4 TECHNICAL INFRASTRUCTURE (PART 2)

Figure 1.3 illustrates the key components of the ICT or technical infrastructure for e-business. The key message being promoted is that ICT is an enabler for organisational change focused around the redesign of the delivery of services and products to key stakeholders – customers, suppliers, partners and employees. Hence ICT is seen to offer the potential for more efficacious, efficient and effective delivery of value along supply, customer, internal and (potentially) community value chains.

ICT is being promoted within both the public and private sectors as a means of improving the efficacy, efficiency and effectiveness of the delivery of services and products to internal and external stakeholders.

A key distinction is essential between products, services and transactions. Products and/or services (represented as broad arrows on Figure 1.3) are typically the

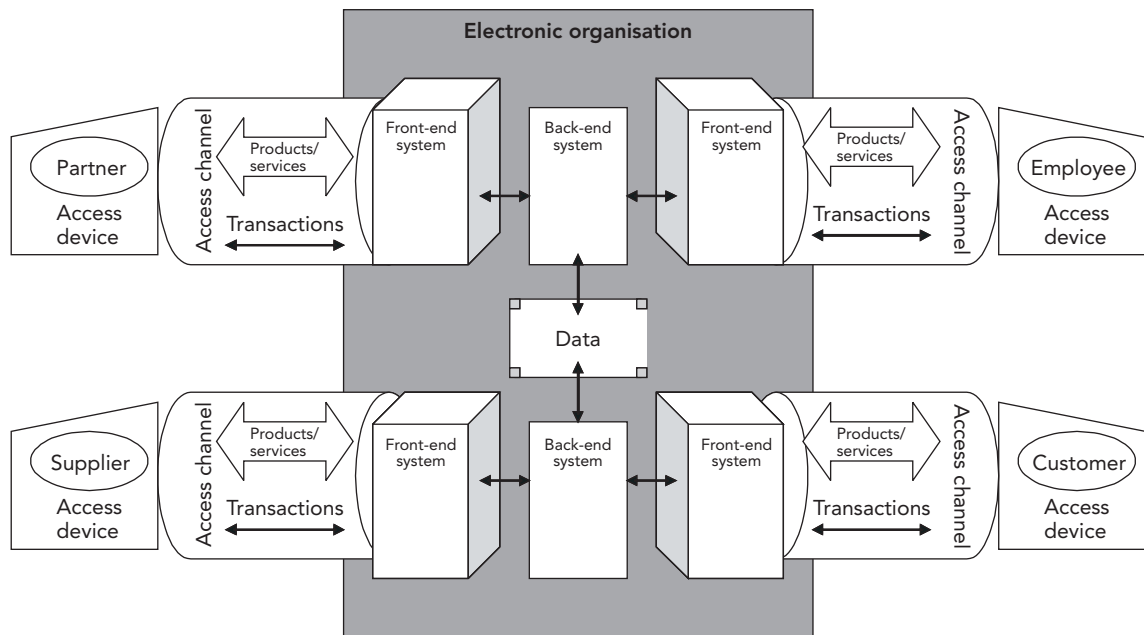


Figure 1.3 The technical infrastructure for e-business.

value delivered to the stakeholder. Hence products and/or services are typically the end points of processes or human activity systems undertaken by organisations (Checkland, 1987).

Information is needed to support most human activity systems, particularly in terms of transactional data. Transactions (indicated as narrow arrows on Figure 1.2) are ways of recording the delivery of products and services and hence are the essential raw data for modelling and evaluating organisational performance. Performance management systems cannot work effectively within organisations without such transactional data. Reducing the costs associated with the administration of transactions is also seen as the typical way of introducing cost savings with ICT.

The objective of redesigning organisational processes or human activity systems with ICT to support electronic delivery of products and services typically involves the changes described in Subsections 1.4.1–1.4.6.

1.4.1 INVESTIGATING AND IMPLEMENTING VARIOUS ACCESS MECHANISMS FOR DIFFERENT STAKEHOLDERS (CHAPTER 7)

In terms of interaction with the customer, face-to-face contact and telephone conversations are two of the most commonly used mechanisms for accessing an organisation's services and/or products. However, with an eye on the longer term, organisations in both the public and private sectors are either implementing or investigating access mechanisms that allow customers to interact with the

organisation remotely using ICT. An access mechanism is typically composed of some access device and access channel. Typical remote access devices being supported are the Internet-enabled personal computer (PC) and interactive digital television (iDTV). There are a number of advantages to both the organisation and its external stakeholders in promoting the use of such access mechanisms. For instance, an organisation may be able to provide access to its services and products 24 hours a day, 365 days a year at relatively low cost.

1.4.2 PROVIDING EFFECTIVE DELIVERY OF INTANGIBLE GOODS AND SERVICES (CHAPTER 8)

Certain goods are primarily information-based or intangible in nature. Key examples here are software and music. As such, they are prime candidates for electronic delivery. This enables certain organisations to replace traditional physical distribution channels with electronic distribution. In this scenario the access channel on Figure 1.3 also becomes a distribution channel.

Many services are also intangible in nature. Key examples here are insurance, legal advice, news reports and monetary transfers. One would expect that such business areas would be prime candidates for electronic service delivery.

1.4.3 CONSTRUCTING FRONT-END ICT SYSTEMS TO MANAGE STAKEHOLDER INTERACTION (CHAPTERS 9, 10, 12)

The technological infrastructure for modern front-end ICT systems relies on two critical technologies: the Internet and the Web.

The Internet (Chapter 9) is a set of interconnected computer networks distributed around the globe and can be considered on a number of levels. The base infrastructure of the Internet is composed of packet-switched networks and a series of communication protocols. On this layer runs a series of applications such as electronic mail (e-mail) and more recently the World Wide Web – the Web for short. The Web (Chapter 10) is effectively a set of standards for the representation and distribution of hypermedia documents over the Internet. A hypermedia document consists of a number of chunks of content such as text, graphics and images connected together with associative links called hyperlinks. The Web has become a key technology for constructing the front-end ICT systems of organisations.

One of the most critical of such front-end ICT systems is the organisation's Web site (Chapter 12). The term *Web site* is generally used to refer to a logical collection of Web documents normally stored on a Web server. Such sites now constitute major ways of providing electronic delivery to customers.

Because of the increasing use of technologies such as the Internet and the Web by stakeholders such as customers, major investment is currently being undertaken by companies to increase levels of interactivity on their Web sites. The aim for many companies is to provide fully transactional Web sites in which customers can undertake a substantial proportion of their interaction with an organisation online.

1.4.4 RE-ENGINEERING OR CONSTRUCTING BACK-END ICT SYSTEMS (CHAPTER 11)

Effective back-end ICT infrastructure is critical to organisational success. The back-end ICT infrastructure of the organisation will particularly manage the operational data of the organisation. Hence, database systems are critical to back-end infrastructure.

A key focus within the e-business agenda is on re-engineering service delivery around the customer. This requires the effective integration and interoperability of back-end ICT systems. Hence, for example, when a customer enters personal details such as their name and address into one system this information should ideally be available to all other systems that need such data.

1.4.5 ENSURING FRONT-END/BACK-END ICT SYSTEMS INTEGRATION (CHAPTER 12)

To enable fully transactional Web sites, the information presented to the user needs to be updated dynamically from back-end databases. Also, the information entered by customers needs to update company information systems effectively. This demands integration and interoperability of front-end and back-end systems within the ICT infrastructure.

1.4.6 ENSURING SECURE TRANSACTIONS ALONG COMMUNICATION CHANNELS (CHAPTER 13)

For effective e-commerce people must trust electronic delivery. A major part of such trust is reliant on ensuring the privacy of electronic data held in ICT systems and the transactions flowing between ICT systems, particularly payments. A number of technologies now exist to ensure such security, including data encryption and digital certificates.

1.5 ENVIRONMENT (PART 3)

We have argued above that an organisation can be considered as a human activity system or more accurately as a series of interdependent human activity systems. An organisation is an open system. It receives inputs from its environment and feeds outputs into its environment. The environment also constrains what an organisation is able to do in terms of its human activity.

Therefore, by *environment* we mean anything outside of the organisation. The environment of most organisations can be considered in terms of the interaction between three major environmental systems: an economic system, a political system and a social system (Figure 1.4). The environment of an organisation constitutes a complex network of relationships and activities between the organisation and other agencies in the social, political and economic spheres.

An open systems model of the organisation emphasises that the relationship between environments and organisations is a dialectical one. Organisations are both affected by and affect environments. The shape of and trends within each area

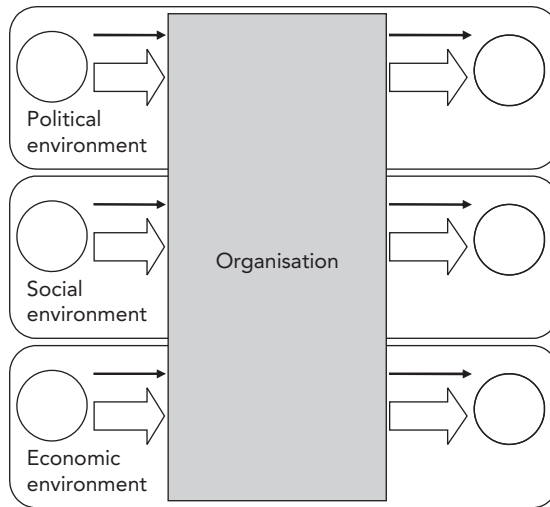


Figure 1.4 The economic, social and political environments.

of the environment will exert an impact on the e-business activities of an organisation. Likewise, the e-business activities of organisations are likely to impact on the social, economic and political spheres.

1.5.1 THE ECONOMIC ENVIRONMENT

For commercial organisations the economic environment (Chapter 14) of the organisation is probably the most important. An organisation exists within some economic system. At the level of the nation state we speak of such an economic system as being an economy. An economic system is the way in which a group of humans arrange their material provisioning. It essentially involves the coordination of activities concerned with such provisioning.

Two major sets of such activities are relevant to economic systems: production and distribution. Production is that set of activities concerned with the creation of goods and services for human existence. Distribution is the associated process of collecting, storing and moving goods into the hands of consumers and providing services for consumers.

Production and distribution are activities that deliver value. Hence economies can be seen as consisting of a multitude of chains of value both within and between organisations.

Economies have two basic mechanisms for coordinating the flow of goods and services in such chains of value: markets and hierarchies (Malone *et al.*, 1987).

- **Markets.** Markets form the competitive environment of the organisation. Markets are systems of competition and comprise media for exchanges between many potential buyers and many potential sellers. Markets coordinate the flow

of goods and services through forces of supply and demand and record exchanges in terms of external transactions between individuals and firms.

- *Hierarchies*. Hierarchies form the cooperative environment of organisations. A hierarchy is a medium for exchanges between a limited number of buyers and sellers. The buyers and sellers exchange goods and services within established patterns of trade. Hierarchies coordinate the flow of goods and services by controlling and directing it at a higher level in management hierarchies.

Many contemporary markets are electronic markets (e-markets). By an e-market we mean one in which economic exchanges are conducted using ICT. In an e-market, electronic transactions between employees, buyers and sellers enable the efficient and effective flow of goods and services through internal, supply, customer and community chains.

In the modern electronic economy, electronic hierarchies will tend towards forms of inter-organisational information system (IOS). An IOS is an information system developed and maintained by a consortium of partner organisations for mutual benefit. Generally such systems provide an infrastructure for the sharing of information and services.

1.5.2 THE SOCIAL ENVIRONMENT

The social environment (Chapter 15) of an organisation concerns the cultural life of some grouping, such as a nation state. In recent times it has been popular to collect notions of society with the increasing impact of ICT under the umbrella term *Information Society*. There are a number of indicators of changes in Western societies that provide evidence for the Information Society, including changes to work structures, the growing use of transactional data and the rise of e-business and e-commerce itself.

In terms of e-business the social system concerns ways in which people relate to organisational activity. Although organisations are producing strategies to encourage their external stakeholders such as customers to use remote modes of access to their services and products, a number of preconditions exist to the successful uptake of such access mechanisms. These preconditions (Figure 1.5) represent the interaction of a range of factors in the social environment that are likely to affect take-up of electronic service delivery and include:

- *Awareness*. Stakeholders must be aware of the benefits of using various remote access mechanisms.
- *Interest*. Stakeholders must be interested in using various remote access mechanisms for their purposes.
- *Access*. Stakeholders must have access to remote access devices from some convenient location.
- *Skills*. Stakeholders must have the skills necessary to use access mechanisms such as the Internet-enabled PC effectively. This is frequently referred to as e-literacy.

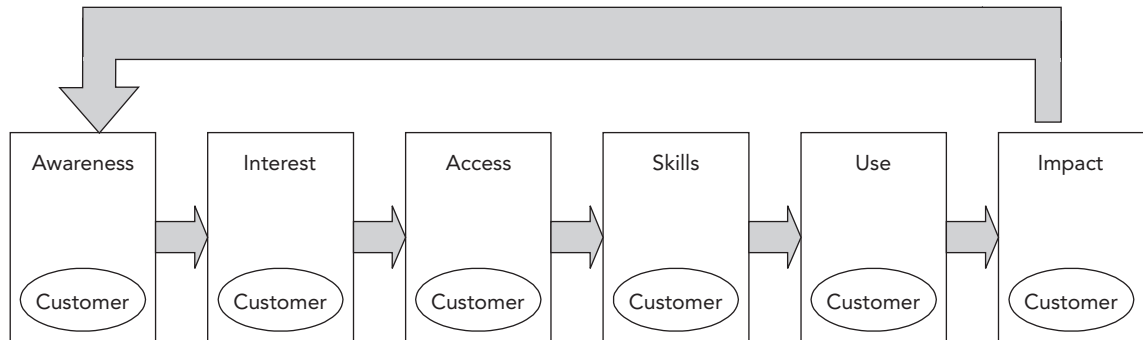


Figure 1.5 Preconditions for electronic service delivery.

- *Use*. Stakeholders must actively use remote access mechanisms on a regular basis in core areas of life such as work and leisure.
- *Impact*. Use of various access mechanisms must approach a threshold that encourages the provision of more content and services delivered electronically.

Social attitudes to issues such as data protection and privacy, as well as trust in e-commerce systems, affects such preconditions in a number of ways. For example, low levels of trust may keep the levels of interest in using transactional services at low levels.

A major concern is that the increasing use of ICT for private and public sector transactions is seen as potentially creating a 'digital divide' between those with access to technology and those who do not. The digital divide fundamentally refers to the phenomenon of differential rates of awareness, interest, access, skills and use among different groups in society. There is substantial evidence to suggest that the lower socio-economic groups in society are the least aware, are the least interested, have the least access to ICT, have the lowest levels of e-literacy and use electronic services the least.

1.5.3 THE POLITICAL ENVIRONMENT

The political environment (Chapter 16) or system concerns issues of power. Political systems are made up of sets of activities and relationships concerned with power and its exercise. The political environment is particularly concerned with government and legal frameworks within nation states and is a major constraining force on organisational behaviour. The practice of government continues to determine policy in the e-business and e-commerce areas.

The rate of development of the Internet as a tool for conducting business has brought challenges to legal systems at a greater rate than previously experienced with the advent of other innovative forms of remote communication. For instance, conventionally law involves a centralised sovereign actor such as a nation state exerting power within its territorial boundaries. This traditional concept of law is challenged by Internet commerce, since it lacks geographical boundaries and there is no centralised authority controlling the Internet. Some of the key areas of

concern for e-business in terms of legislation include the use and enforcement of contracts and intellectual property rights.

The political environment of Western countries has been much subject to the influence of ICT in the areas of electronic government (e-government) and electronic democracy (e-democracy) in recent times. ICT and information systems are being used to re-engineer aspects of governmental processes and the relationship between government and the citizen. The interface between government and citizens in terms of services such as tax collection and benefit payment and the associated use of ICT systems to deliver these services via government agencies is sometimes referred to as *e-government*. The term *e-democracy* may be restricted to the use of ICT in the service of democratic representation between government and citizen and the associated use of ICT within democratic processes in government.

1.6 E-COMMERCE (PART 4)

Commerce constitutes the exchange of products and services between businesses, groups and individuals. Commerce or trade can hence be seen as one of the essential activities of any business. Commerce of whatever nature can be considered as a process of exchange between economic actors with the following generic phases or states:

- *Pre-sale*. This involves activities occurring before a sale occurs.
- *Sale execution*. This comprises the activities of the actual sale of a product or service between economic actors.
- *Sale settlement*. This involves those activities which complete the sale of a product or service.
- *After sale*. This involves those activities which take place after the buyer has received the product or service from the seller.

It is possible to distinguish between three major patterns of commerce (Chapter 17) in terms of their frequency of occurrence (Whiteley, 2000). Repeat commerce is the pattern in which regular, repeat transactions occur between trading partners. Credit commerce is where irregular transactions occur between trading partners and the processes of settlement and execution are separated. Cash commerce occurs when irregular transactions of a one-off nature are conducted between economic actors. In cash commerce the processes of execution and settlement are typically combined (Figure 1.6).

E-commerce focuses on the use of ICT to enable all such trading activities and relationships of the business with individuals, groups and other businesses. Generally we may distinguish between three distinct forms of e-commerce.

1.6.1 B2C E-COMMERCE (CHAPTER 18)

Business to consumer e-commerce is sometimes called sell-side e-commerce and concerns the enablement of the customer chain with ICT. Customers or consumers

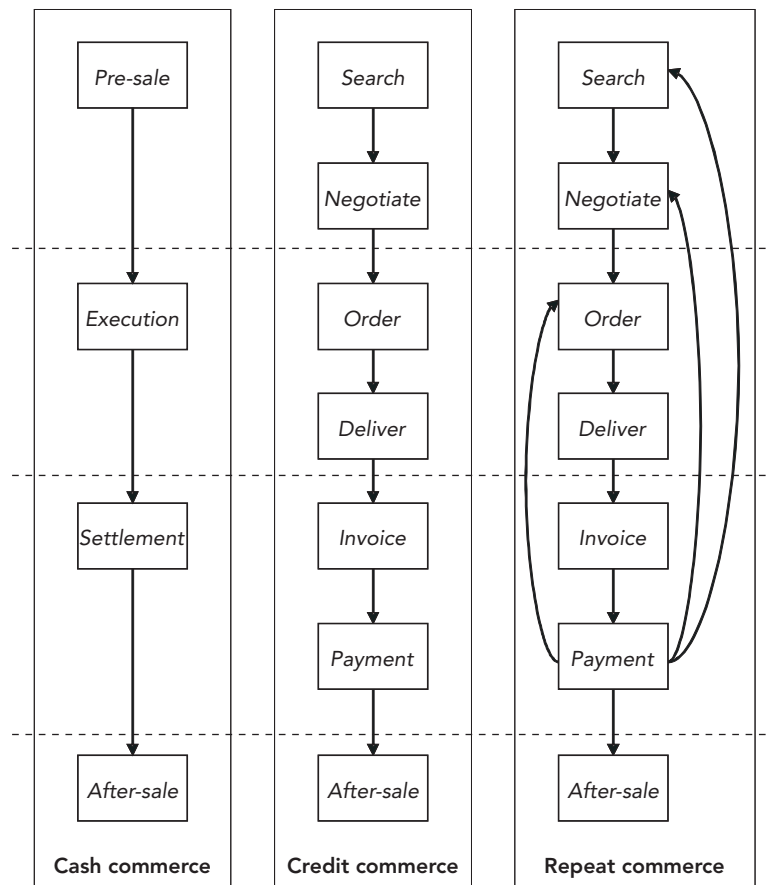


Figure 1.6 Forms of commerce.

will typically be individuals, or sometimes other organisations. B2C commerce typically follows a cash commerce model. Cash commerce for low and standard-priced goods typically follows the four stages of the generic commerce model quite closely. It typically involves a see/buy/get sequence.

For medium- to high-priced items some form of credit commerce will operate. In other words, organisations will search for a product, negotiate a price, order a product, receive delivery of the product, be invoiced for the product, pay for the product and receive some form of after-sales service. Typically, B2C e-commerce will utilise a market model of economic exchange.

1.6.2 B2B E-COMMERCE (CHAPTER 19)

Business to business e-commerce is sometimes called buy-side e-commerce and involves supporting the supply chain with ICT. B2B commerce is clearly between organisational actors – public and/or private sector organisations. This form of e-

commerce invariably concerns the use of ICT to enable forms of credit commerce between a company and its suppliers or other partners. For high-priced and customised goods traded between organisations some form of repeat commerce model operates. In other words, the same processes occur as for credit commerce, but the processes cycle around indefinitely in a trusted relationship between producer and consumer. Hence typically some form of managerial hierarchy is employed to control the operation of the commercial relationship.

1.6.3 C2C E-COMMERCE (CHAPTER 20)

Consumer to consumer e-commerce concerns the enablement of the community chain with ICT. C2C e-commerce occurs primarily between individuals and typically involves forms of cash commerce generally for low-cost services or goods. Consequently, it tends to follow a market model for economic exchange. Other forms of value may be generated in the communities or social networks engaged in C2C e-commerce. Of particular interest is the degree of social capital that may be located in such social networks. Social capital is the productive value of people engaged in a dense network of social relations. Social capital consists of those features of social organisation – networks of secondary associations, high levels of interpersonal trust, reciprocity – which act as resources for individuals and facilitate collective action.

1.6.4 E-MARKETING AND E-PROCUREMENT

Two key sub-processes of B2C and B2B e-commerce are important because of their contemporary significance as key process strategies for improving organisational performance.

- *E-marketing*. In the case of B2C e-commerce electronic marketing (E-marketing) (Chapter 21) is an important way of impacting upon the efficiency and effectiveness of the customer chain. E-marketing is the use of electronic channels for the delivery of promotional material.
- *E-procurement*. In the case of B2B e-commerce engaging in electronic procurement (e-Procurement) is an important way to improve the efficiency and effectiveness of an organisation's supply chain (Chapter 22). The pre-sale activity of search, negotiate and order in the supply chain is frequently referred to under the umbrella term of *procurement*. Sometimes the term procurement is used to refer to all the activities involved in the supply chain.

1.7 THE SOCIAL INFRASTRUCTURE FOR E-BUSINESS (PART 5)

The social infrastructure for e-business consists of those human activity systems central to supporting the conduct of e-business. As well as the conventional competencies in areas of human activity such as finance, sales and production, the

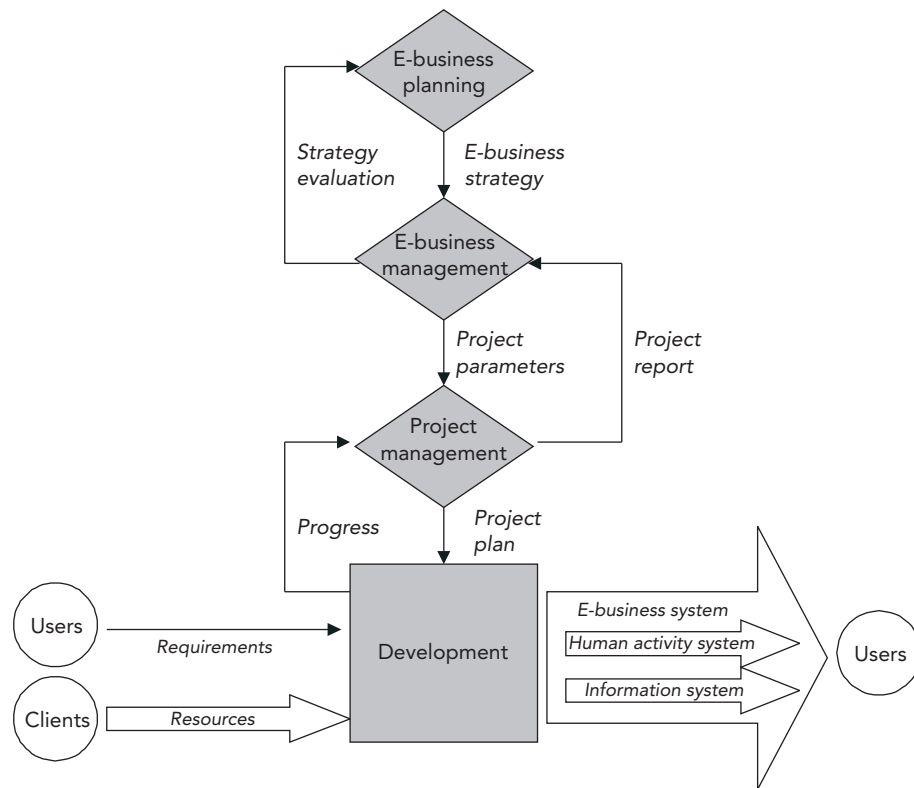


Figure 1.7 The relationship between e-business planning, management and development.

e-business must develop informatics competencies (Beynon-Davies, 2002) if it is to survive in the marketplace. These include competencies in e-business planning, management, development and evaluation. Figure 1.7 illustrates the relationships between these three of these critical processes. In systems terms, these processes can be envisaged in terms of a hierarchy of control. Planning controls management, which in turn controls development.

The major point to be made is that effective e-business planning, management, development and evaluation are critical for the effective alignment of human activity systems, information systems and ICT in business.

1.7.1 E-BUSINESS PLANNING

E-business planning (Chapter 23) is the process of deciding upon the optimal e-business infrastructure for an organisation. It is also the process of planning the transformation from one e-business infrastructure into another. E-business infrastructure includes both human activity systems infrastructure and informatics infrastructure. The key output from e-business planning is e-business strategy. The

planning process also should include performance monitoring – information fed back from the management process – which is critical to the ongoing evaluation of strategy.

1.7.2 E-BUSINESS STRATEGY

E-business concerns itself with the juncture of ICT and the organisation. Therefore e-business must concern itself with the development of both organisational strategy and informatics strategy. In a sense, e-business strategy (Chapter 24) is both organisational and informatics strategy.

We would argue that there are at least three different viewpoints as to what e-business strategy constitutes. The appropriate viewpoint is defined by organisational context.

- *E-business strategy is organisation/corporate strategy.* In this viewpoint there is little or no distinction between organisation strategy and e-business strategy. This definition is appropriate if the e-business is effectively the entire corporation, as is the case in so-called ‘clicks-only’ companies – companies that run their entire business through electronic channels.
- *E-business strategy is business unit strategy.* In many companies the e-business strategy may only be applicable to a particular business unit. For example, some companies run their e-businesses as separate but parallel operations.
- *E-business strategy is a process strategy.* A key organisational process or human activity system, or perhaps an integrated set of such processes, may be chosen for radical redesign with ICT innovation. For example, a company may decide that it wishes to concentrate on redesigning its supply chain or customer chain processes with ICT innovation. We would argue that this is the most ubiquitous form of e-business strategy. It defines the most popular form of the so-called ‘clicks and mortar’ company – traditional businesses which have established an online presence.

1.7.3 E-BUSINESS MANAGEMENT

Two forms of management are delineated on Figure 1.7 – general e-business management and project management. E-business management (Chapter 25) is the process of putting e-business plans into action and monitoring performance against plans. E-business management will implement a portfolio of projects by defining and resourcing projects. However, individual projects need to be managed as autonomous fields of activity and progress reported to general management processes.

1.7.4 E-BUSINESS DEVELOPMENT

E-business development (Chapter 26) is the process of implementing the plans documented in strategy and resourced from management. E-business systems are

socio-technical systems consisting of information systems and the human activity systems they support. Such systems will be constructed by a development organisation and nowadays frequently employ Web-based standards and technologies. Detailed requirements are likely to be supplied by potential users of such systems to the development organisation. Clients such as managerial groups will typically supply key resources to the development organisation to enable such acts of 'engineering'.

1.7.5 E-BUSINESS EVALUATION

E-business strategy, project parameters and project plans are all control inputs in this hierarchy of control. Development progress, project reports and strategy evaluations are all forms of feedback. Figure 1.7 is meant to emphasise that planning, general management, project management and development are continuous processes. As in any human activity system it is important that the feedback loops work effectively for the social infrastructure of e-business to be a viable system. Information systems are equally critical to such processes as conventional business processes such as sales and manufacturing.

One critical subprocess within management is that of evaluation. Evaluation (Chapter 27) is the process of assessing the worth of something. At the highest level, evaluation is critical to the continuous assessment of strategy. At the lowest level, evaluation is critical to the assessment of ICT systems within their context of use and application, namely human activity systems.

1.8 SUMMARY

- E-business is the utilisation of information and communication technologies to support all the activities of business. E-commerce focuses on the use of ICT to enable the external activities and relationships of the business with individuals, groups and other businesses. I-commerce focuses on the use of Internet and Web technologies for e-commerce.
- E-business is a superset of e-commerce. E-commerce is a superset of i-commerce.
- The key message being promoted by e-business is that ICT is an enabler for organisational change focused on the redesign of the delivery of services and products to key stakeholders – customers, suppliers, partners and employees.
- The objective of redesigning organisational processes or human activity systems with ICT to support electronic delivery of products and services typically involves remote access mechanisms, delivery of intangible goods and services, constructing front-end ICT systems to manage customer interaction, ensuring effective back-end systems integration and front-end/back-end systems integration, and ensuring the security of data and transactions.
- An organisation can be considered as a human activity system or more accurately as a series of human activity systems. An organisation is an open system. It receives

inputs from its environment and produces outputs into its environment. The environment also constrains what an organisation is able to do in terms of its human activity. The environment of most organisations can be considered in terms of the interaction between three major environmental systems: an economic system, a political system and a social system.

- Economies are systems for coordinating the production and distribution of goods and services. Economic activity is organised in terms of markets or hierarchies. Markets are systems of competition. They are media of exchange between buyers and sellers. Hierarchies are systems of cooperation. Exchange is conducted on the basis of established trading arrangements.
- E-business and e-commerce are features of e-markets and e-hierarchies. E-markets and e-hierarchies are environments in which economic exchanges are conducted using ICT. E-markets are electronic environments for competition. E-hierarchies are electronic environments for collaboration.
- The political environment is particularly concerned with government and legal frameworks within nation states. The practice of government determines policy in the e-business and e-commerce areas. However, e-business is also a significant force in government. The political environment of Western countries has been much subject to the influence of ICT in the areas of electronic government and electronic democracy in recent times.
- The social system concerns ways in which people relate to organisational activity. Social attitudes to issues such as data protection and privacy as well as trust in e-commerce systems affects the practicality of e-business.
- A number of preconditions exist for the successful take-up of electronic service delivery, including awareness, interest, access, skills, use and impact.
- The increasing use of ICT for private and public sector transactions is seen as potentially creating a 'digital divide' between those that successfully engage with the preconditions and those who do not.
- Commerce of whatever nature can be considered as a process with the following phases: pre-sale, sale execution, sale settlement, after-sale. The precise form of the process of commerce will vary in terms of the nature of the economic actors involved, the frequency of commerce and the nature of the goods or services being exchanged.
- Electronic commerce (e-commerce) is the use of ICT to enable the external activities and relationships of the business with individuals, groups and other businesses. Generally we may distinguish between three major forms of e-commerce: B2C e-commerce, B2B e-commerce and C2C e-commerce.
- Two key sub-processes of B2C and B2B e-commerce are important because of their contemporary significance as key process strategies for improving organisational performance. E-marketing is the use of electronic channels for the delivery of promotional material. E-procurement is an important way to improve the efficiency and effectiveness of an organisation's supply chain.

- The social infrastructure for e-business consists of those human activity systems central to supporting the conduct of e-business. As well as the conventional competencies in areas of human activity, such as finance, management and production, the e-business must develop informatics competencies if it is to survive in the marketplace. These include competencies in e-business planning, management, development and evaluation.

1.9 ACTIVITIES

- (i) Attempt to model at a high-level an organisation known to you in systems terms.
- (ii) Find one example of an e-market and describe its key stakeholders and features.
- (iii) Find one example of an e-hierarchy and describe its key stakeholders and features.
- (iv) Choose an industrial or commercial sector. Investigate the degree with which B2B and B2C e-commerce has penetrated the sector.
- (v) Find one example of an inter-organisational information system and analyse some of the reasons for its creation.
- (vi) Investigate the take-up of e-business, e-commerce and i-commerce amongst companies in your local area.
- (vii) Determine the costs and benefits associated with e-business.
- (viii) In terms of a particular market sector determine whether customers in the sector meet the preconditions for electronic service delivery.
- (ix) In terms of some organisation known to you determine the degree to which it engages in one or more of the aspects of the social infrastructure for e-business.

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