Management and innovation of e-business
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IS3 167, 2790 167
2011

Undergraduate study in Economics, Management, Finance and the Social Sciences

This is an extract from a subject guide for an undergraduate course offered as part of the University of London International Programmes in Economics, Management, Finance and the Social Sciences. Materials for these programmes are developed by academics at the London School of Economics and Political Science (LSE).
For more information, see: www.londoninternational.ac.uk
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Chapter 1: Introduction

167 Management and innovation of e-business is a ‘300’ course offered on the Economics, Management, Finance and the Social Sciences (EMFSS) suite of programmes.

It is a subject which provides students with insights and an understanding of the past, present and future of e-business systems. In less than two decades, e-business has grown from a hobby for computer ‘geeks’ to become an essential channel for:

- Communication, with the growth of email and instant messaging for internal and external business communications.
- Marketing, by giving firms the opportunity for one-to-one marketing.
- Sales, such that the online travel business makes up around 50 per cent of the US market.
- Advertising: Google’s 2008 advertising revenue was $21.1 billion.
- Distribution of digital goods, with the huge growth of music downloads.
- Recruitment: Monster UK hold three million CVs = 13 per cent of the UK’s working population.
- And many, many more functions.

As early as 1999, it was widely claimed that the internet is ushering in an era of change that will leave no business untouched and, unlike much of the hype surrounding new technology, it is hard to deny that this proposition is correct. During the course of one of our e-business research projects (Clegg et al., 2005), one of the interviewees told us that: ‘E-business is like an octopus: it has tentacles in all a company’s operations.’ This is a powerful image — and in this course we will show how e-business stretches throughout the organisation and along the whole value chain from raw materials to the final consumer. Along the way e-business has transformed organisations and their relationships with customers and trading partners.

The web is now indispensable in both business and everyday life as we use it to search for information on anything from cinema times to share prices and medical information. And now (in 2010), web 2.0 offers the prospect of taking all these developments a stage further with social networking, wikis and blogs. For virtually all of us, e-business has quite simply changed our lives.

Many students approaching this course may think that it is going to be a technical course but, while you do need to understand the technology (and this is covered in Chapter 2), most of this course is concerned with the management, business and social aspects of e-business. We treat the technology as a tool and prefer to study the impact of its use, rather than how to build the tools. Common misunderstandings are that either e-business is somehow an amateur activity that takes place in garages or else it’s a licence to print money. Neither is correct. Large companies expend considerable resources on their e-business systems and, with relatively few exceptions, websites and their associated systems are now highly professional. Similarly, although some individuals (for example, Larry Page and Sergey Brin, co-founders of Google; Mark Zuckerberg, Dustin Moskovitz and Chris Hughes, co-founders of Facebook) have become very rich through e-business, the strong tradition is that information on the web is free. Many of the products sold on the web are highly discounted which has meant that high profits and excess ‘rents’ are
few and far-between and new business models are being widely explored to leverage the power of the technology for profit.

What you will take away from this course is an understanding of how and why e-business developed so quickly and where it fits within modern business and society. It is a particularly relevant course for those of you who want to go on to careers in customer-facing or coordinating activities as e-business has transformed much of the retail sector as well as the ways that organisations function internally, in addition to how they collaborate with their trading partners.

We teach a very similar course at LSE where it is offered as a Summer School course. Our particular interests are in both B2C (business-to-consumer) and B2B (business-to-business) systems, and we also have an interest in the subject from the perspective of innovation. Our background is in management and economics, and it is theories from these disciplines that we employ in analysing e-business. We feel that, due to its pervasiveness in business and organisational life, it has links with all management and social science course offered by the International Programmes, from the principles of marketing to sociology. E-business also represents an important evolution from the days when computer-based information systems were mostly internal to the organisation to today, when e-business provides both a ‘shop window’, through websites, and a transaction and coordination mechanism, through payment systems and supply chain management. Thus, e-business represents a practical culmination of ‘information systems thinking’ from the past four decades and this course links theoretically and in practice with all other information systems courses.

We hope that you enjoy studying this course and encourage you to engage fully with the topic as it is significant to both your career and everyday life.

Aims and objectives

This course presents an up-to-date analysis of the management, innovation and information systems aspects of the use of e-business technology. It combines transaction cost economics with a decade’s experience of e-business development to discuss e-business trends and strategies. This is a management information systems course and not a technical course. It considers the organisational, managerial, technological and theoretical aspects of e-business and how these elements can be combined to produce innovation in business models, processes and products.

The aims of the course are to:

• explain the growth of e-business to date, both business-to-consumer and business-to-business, using relevant theories from business, management and the social sciences
• examine the interaction between technological trends and the business and social context of e-business, including the diffusion of social networks and web 2.0 developments
• identify innovations within the domain of e-business by presenting cases of the innovative use of e-business technologies
• present relevant theories from business, management and the social sciences that help to explain the development and growth of e-business
• discuss different e-business (business) models and strategies, including global supply chain management and electronic markets
• introduce the notion of new organisational forms, such as virtual organisations, electronic markets and open source production, which depend upon e-business technology.

Learning outcomes

By the end of studying this course, you should have achieved certain key learning outcomes. By a 'learning outcome' we mean an area of the subject in which you have acquired knowledge and skills, and are able to present relevant information, alternative analyses, reasoned arguments and exercise your own judgment.

Upon completion of this course, you should be able to:

• explain the history of e-business from the dot.com boom to the present day
• critically discuss successful and failed e-business ventures
• assess the role of innovation in e-business
• explain the key elements of e-business technology including websites, inter-organisational networks and social networks
• describe the social and legal context within which e-business has prospered
• explain the growth of social networks and their impact on e-business
• analyse and criticise the business models underlying e-business proposals and existing e-business systems
• discuss the changing structure of business-to-business e-business and the shifting role of intermediation
• apply economic theories, such as transaction cost analysis, to explain the economics of e-business
• explain the interaction between the needs of business and the potential of e-business technology to produce new organisational structures and different ways of working (e.g. outsourcing, mobile working and teleworking)
• discuss the key innovations in business models, products and processes and how e-business contributes to innovation through, for example, open source development and open innovation.

This set of learning outcomes is provided here as a high-level overview of the positive outcomes of your study. As you tackle the course you should return to this list from time to time and note down those that you feel you have made progress with and those that you need to work on more. You must also remember that the overall aim of the subject is to develop a critical and reflective appreciation of the impact of e-business technology and innovation on business activities.

How to use this subject guide

This subject guide is written to provide an interpretive guide for the study of the course’s set textbook: Chaffey (2009) E-business and e-commerce management. The guide is not — and cannot be — a substitute for the book itself. You should purchase a copy of this textbook and be familiar with, understand and be able to apply most of its contents. We strongly recommend that you first read through the whole subject guide and then read the relevant chapters of the textbook, in the order suggested in the subject guide. The aim of the subject guide is to help you to interpret
the syllabus and guide you through the textbook. It outlines what you are expected to know, understand and apply for each area of the syllabus and suggests relevant readings, including references to the textbook, to help you to understand the material.

It is important that you appreciate that different topics are not self-contained. There is a degree of overlap between them and you are guided in this respect by the cross-referencing between chapters. In terms of studying this subject, the chapters of this guide are designed as self-contained units of study but, for examination purposes and to understand the realities of e-business fully, you need to have a good understanding of the subject as a whole. This includes both technological and management issues, as well as organisational, social and (a few) legal issues. 'Business' is fundamentally about people and e-business is about the utilisation of particular technologies in business.

You should also understand the connections to other courses you have studied, including units from management, sociology and economics. The implementation of e-business technology has resulted in changes in organisations, society and the global economy through, for example, virtual organisations, social networking and global supply chain management. As you read about these topics in the guide, you should reflect on how these changes link to your understanding of these disciplines.

At the end of each chapter you will find a checklist of your learning outcomes, which is a list of the main points that you should understand once you have covered the material in that chapter and the associated readings.

Structure of the guide

Chapter 2: E-business technology and infrastructure

The aim of this chapter is to provide you with a basic understanding of how e-business technologies work. This is not a computer science or technological course as such, and you do not need to understand the detailed computational techniques involved, nor do you need to be able to write computer programs. We discuss the most common hardware and software configurations and architectures used to support e-business activities, treating the components as ‘black boxes’. You do not need to open these ‘boxes’; that is the job of technicians and not of managers. However, you do need to understand what each box contributes to the overall e-business network. In this chapter we discuss, for example, electronic data interchange (EDI) and web 2.0 design tools. In the Further reading, we provide references for you should you wish to examine individual technologies in more depth. While these technologies are constantly changing and improving, the basic concepts are stable and a good understanding of them will not become out of date overnight. This chapter will be of particular interest to those of you following the BSc Information Systems and Management degree.

Chapter 3: Economic theories of e-business

This chapter presents the transaction costs theoretical framework to explain the deployment of and challenges faced by e-business strategies. This framework provides a robust explanation of the basic economics of e-business. On this basis, the chapter discusses how information and communications technology (ICT) can be designed and deployed to reduce the costs of transactions and hence to change the structure and dynamics
Chapter 1: Introduction

of markets for products and services exchanged through e-business. The chapter also discusses the theoretical implications of disintermediation and re-intermediation (the changing roles of intermediaries or ‘middle men’), according to the economics of transaction costs.

Chapter 4: Business-to-consumer (B2C) systems and strategies

This chapter focuses on the B2C, or retail, side of e-business, which drove the development of most of the early websites, such as Amazon and eBay. Here we describe the most common business models, such as ‘pure play’ and ‘clicks-and-mortar’, and revenue models, such as catalogue and subscription. We identify the key revenue strategy issues and relate them to the newer business models available in the digital economy. Because of the easy access to these websites we encourage you to explore the issues through practical activities and B2C case studies. Some of the latter involve large well-known companies, while others are much less familiar. Last but not least, this chapter reviews the practical challenges of implementing B2C systems emerging from a variety of factors, including security, privacy, service quality and legal protection, online consumer behaviour, and regional and cultural differences.

Chapter 5: Marketing for e-business

This chapter discusses the marketing opportunities and challenges faced by companies investing in online business. Similarities and differences between online and off-line marketing strategies are discussed. The chapter focuses on the importance and risks of multi-channel marketing as a contemporary approach to managing customer relationships. It also deals with the problems of implementing customer relationship management systems that link directly to customer-facing websites.

Chapter 6 Business-to-business (B2B) models and strategies

This chapter discusses the various B2B models and strategies that have been developed over recent years. The different organising structures of B2B activities (buyer-oriented, seller-oriented and intermediary-oriented) are presented and compared, together with an analysis of some of the important issues arising from implementing these structures. In addition, we discuss e-procurement, the application of e-business technology to the procurement process whereby businesses obtain supplies of raw materials, components and the operational goods and services needed to run the companies.

Chapter 7: Supply chain management

The growing importance of global supply chains has shifted this topic from the relative obscurity of operations management and logistics to become a central issue within e-business. These supply chains have facilitated the globalisation of both production and consumption as companies seek low-cost sources of production and attractive new markets across the world. To make such supply chains work effectively, new technologies and new strategies are utilised within supply chain management. This chapter describes how the technologies are employed, and how the relationships between trading partners are being changed.

Chapter 8: Web 2.0 in business and society

The introduction of web 2.0 tools, such as wikis, blogs and social networking websites, has seen a major change in the role of e-business users, both in their working and personal lives. There has been a shift from passive consumption, the hallmark of B2C under web 1.0, to a much more active participation. As well as changing particular aspects of social
behaviour, these tools offer businesses a new way to engage with their employees, trading partners and customers. This chapter describes the various tools and discusses how they are being used and how they are changing many aspects of everyday life.

Chapter 9: New forms of organisation
Organisational structures remain a chronic problem for companies as they search for ways to improve their efficiency and effectiveness. In a dynamic business environment, they strive to be flexible and innovative while squeezing costs and improving coordination. E-business technologies, from the internet to web 2.0 tools, offer the opportunity to change the way that work is performed, including mobile work, telework and open source production. This chapter discusses these new alternatives and reviews the experiences of various companies to date. However, such changes to organisations, and even the implementation of e-business itself, can result in severe problems of organisational change. This chapter reviews the issues involved in this difficult area.

Chapter 10: Security issues in the digital environment
A large amount of information has to be exchanged to enable, support and validate online transactions. It is crucial to the continuing growth of e-business that this information, and the underlying transactions, remain secure. Consumers and businesses have to be able to trust each other as well as the underlying infrastructure and e-business technology that provide a potential tool for criminal endeavours. This chapter discusses the information management strategies that may be put in place to preserve, secure and validate the quality of e-business transactions. It not only covers technical solutions but also discusses the social, legal and institutional aspects of security in the digital environment.

Chapter 11: Conclusion and implications for e-business strategies
This chapter summarises the arguments within the subject guide and consolidates the various threads that run through the guide before arguing that e-business is becoming a competitive necessity in many industries, as well as becoming pervasive throughout organisations. This chapter reviews the key models for creating and analysing the e-business strategies of companies and shows how these conceptual tools can be used to design and implement e-business solutions. A number of case studies are included in this chapter, in order to demonstrate how the technologies and business models have been combined strategically in the pursuit of profit (both successfully and unsuccessfultly).

Syllabus
This course covers a broad spectrum of today’s management opportunities and risks in virtual markets, including:

- history and foundations of online business
- the use of transaction cost theory to explain the economics of e-business
- e-business models: business-to-business (B2B) and business-to-consumer (B2C) business models and strategies for e-business – global supply chain management, electronic markets
- B2B systems, intermediation, e-procurement and IT in supply chain management
- B2C strategies – online consumer behaviour, regional and cultural differences and e-marketing
• e-business environment – legal, ethical and security issues; lessons from
the dot.com boom and bust
• new organisational forms – virtual organisations, electronic markets
and hierarchies
• social networks and web 2.0 developments
• innovations involving e-business technologies; the role of open
innovation in product and process development.

**Essential reading**

The main text is:

Chaffey, D. *E-business and e-commerce management*. (Harlow: Financial Times/

It is always preferable that you have access to the latest editions of
books. The worlds of business and information technology move very
rapidly, as does our understanding of what is important and relevant in
their interaction. If, during the period that this subject guide is in print, a
new edition of the textbook is produced, you should assume that the new
edition is the valid edition for study.

It is essential that you support your learning by reading as widely as
possible and by thinking about how the issues apply in the real world.
To help you read extensively, you have free access to the Online Library
where you will find the full text or an abstract of the journal articles listed
in this guide. You should use the same username and password to access
this resource as you use for the Student Portal. The Online Library can be
accessed via the Student Portal at https://my.londoninternational.ac.uk
(see below). In addition to the textbook, there are certain key articles that
you should read for each chapter:

- Boyd, D.M. and N.B. Ellison ‘Social network sites: definition, history and
  scholarship’, *Journal of Computer-Mediated Communication* 13 2008,
- Bughin, J., M. Chui and B. Johnson ‘The next step in open innovation’, *The
- Chu, C. and S. Smithson ‘E-business and organizational change: a
  structurational approach’, *Information Systems Journal* 17(4) 2007,
  pp.369–89.
- Clegg, C.W., C. Chu et al. ‘Sociotechnical study of e-business: grappling with
  an octopus’, *Journal of Electronic Commerce in Organizations* 3(1) 2005,
  pp.53–71.
- Cordella, A. ‘Transaction costs and information systems: does it add up?’,
- Howcroft, D. ‘After the goldrush: deconstructing the myths of the dot.com
  market’, *Journal of Information Technology* 16(4) 2001, pp.195–204.
- Kasper-Fuehrer, E.C. and N.M. Ashkanasy ‘The interorganizational virtual
  organization’, *International Studies of Management and Organization* 33(4)
  2004, pp.34–64.
- Lee, H.L. ‘Aligning supply chain strategies with product uncertainties’,
- Ljungberg, J. ‘Open source movements as a model for organizing’, *European
- Lohse, G.L. and P. Spiller ‘Electronic shopping’, *Communications of the ACM*


Further reading

Please note that as long as you read the Essential reading you are then free to read around the subject area in any text, paper or online resource. You will need to support your learning by reading as widely as possible and by thinking about how these principles apply in the real world. To help you read extensively, you have free access to the virtual learning environment (VLE) and University of London Online Library (see below).

Other useful texts for this course include:


Online study resources

In addition to the subject guide and the Essential reading, it is crucial that you take advantage of the study resources that are available online for this course, including the virtual learning environment (VLE) and the Online Library.

You can access the VLE, the Online Library and your University of London email account via the Student Portal at:
http://my.londoninternational.ac.uk

You should receive your login details in your study pack. If you have not, or you have forgotten your login details, please email uolia.support@london.ac.uk quoting your student number.

The VLE

The VLE, which complements this subject guide, has been designed to enhance your learning experience, providing additional support and a sense of community. It forms an important part of your study experience with the University of London and you should access it regularly.
The VLE provides a range of resources for EMFSS courses:

- **Self-testing activities**: Doing these allows you to test your own understanding of subject material.
- **Electronic study materials**: The printed materials that you receive from the University of London are available to download, including updated reading lists and references.
- **Past examination papers and Examiners’ commentaries**: These provide advice on how each examination question might best be answered.
- **A student discussion forum**: This is an open space for you to discuss interests and experiences, seek support from your peers, work collaboratively to solve problems and discuss subject material.
- **Videos**: There are recorded academic introductions to the subject, interviews and debates and, for some courses, audio-visual tutorials and conclusions.
- **Recorded lectures**: For some courses, where appropriate, the sessions from previous years’ Study Weekends have been recorded and made available.
- **Study skills**: Expert advice on preparing for examinations and developing your digital literacy skills.
- **Feedback forms**.

Some of these resources are available for certain courses only, but we are expanding our provision all the time and you should check the VLE regularly for updates.

### Making use of the Online Library

The Online Library contains a huge array of journal articles and other resources to help you read widely and extensively.

To access the majority of resources via the Online Library you will either need to use your University of London Student Portal login details, or you will be required to register and use an Athens login: http://tinyurl.com/ollathens

The easiest way to locate relevant content and journal articles in the Online Library is to use the Summon search engine.

If you are having trouble finding an article listed in a reading list, try removing any punctuation from the title, such as single quotation marks, question marks and colons.

For further advice, please see the online help pages:
www.external.shl.lon.ac.uk/summon/about.php

### Other resources

You should also make a habit of **regularly** consulting weekly and monthly journals and newspapers and in this way ‘keeping up’ with trends in the area. You must remember that new ideas, new technologies and new applications of technology are usually first reported in newspapers and magazines, sometimes years before they find their way into textbooks or journal articles. Reading such contemporary accounts will also help you to develop your sense of judgment about all sorts of e-business issues. Bear in mind, however, that you should not believe **everything** you read. You must always take a critical perspective on what you read.
Most broadsheet or business newspapers, such as the Financial Times or the Wall Street Journal, have regular e-business articles. In recent years the Financial Times has published a regular series of supplements on mastering management, and these supplements have all included much relevant material on e-business. In addition, most countries have local publications devoted to computers and information systems, and these can also provide useful material for study. This includes news of local and global e-business initiatives and issues, examples or case studies of e-business in use, and discussion of relevant development and management practices. Among the best-known publications that may be found in libraries are the following:

- The Economist (www.economist.com): although this is not a computer magazine, it does contain regular articles on aspects of e-business
- E-commerce Times (www.ecommercetimes.com)
- Financial Times Digital Business (www.ft.com/technology/digitalbusiness)
- Wired Magazine (www.wired.com).

These magazines are representative of distinct types of reading. In your reading, and for developing wider perspectives on this subject, you should try to read regularly from all these types of publication. It is a very good practice to keep a file of cuttings, photocopies and articles collected throughout your period of study. When you come to the end of the unit, such a resource can be very valuable as a revision aid and as a panorama of contemporary e-business issues and debates.

**Using the essential textbook**

When you first look at the recommended text – Chaffey (2009) E-business and e-commerce management – you may be surprised at the quantity of information it contains and the complex layout of material. Because this book covers an extensive and complex subject area it is useful, as you start to study for this subject, to take some time to explore this subject guide to know how to approach the rich and complex information you will find in the textbook.

The chapters of the book also contain many pictures, screen shots, tables, figures and diagrams. These are intended to be read along with the text, and to help the reader to understand and absorb key ideas. They are not a substitute for reading and thinking about the text. It should be obvious that there are too many figures to memorise them all, so do not try! What you should be able to do is understand and analyse these figures in light of the overall schema provided by this subject guide.

The book’s chapters and those in the subject guide are organised according to a slightly different structure. You have to keep in mind that the two readings are complementary but that the underlying structure of the course is provided by the subject guide and not the textbook. You should read the textbook, plus any other reading indicated by the guide, once you have understood what the course is aiming at. This understanding is provided by the subject guide.

The set textbook has a website at www.pearsoned.co.uk/chaffey and you should take a look at the site and what it offers. You will also note that the textbook contains relatively few other web addresses. This is very sensible, since web addresses and resources change rapidly, and it is much easier to update a website than a published book. Thus the book’s website contains links to other sites that relate to individual chapters. The same problems relate to placing web addresses in this guide – they may well change – but a few are included here that you may find useful:
• www.datamation.com — the website of Datamation magazine
• http://foldoc.doc.ic.ac.uk — the free online dictionary of computing maintained at Imperial College, University of London. This is mostly about computer technology, but it includes useful coverage of some information systems topics
• www.britannica.com — the website of the Encyclopaedia Britannica; this is a good source of material on the history of communications and the computer
• http://en.wikipedia.org/wiki/Main_Page — this open source encyclopedia embodies the strengths (and a few of the weaknesses) of wikis, a key web 2.0 tool, and there is no better way to understand the technology than by using it
• http://home.aisnet.org — this is the main website for the academic information systems community in universities around the world and it has links to many other sites
• http://arstechnica.com/business — this website contains technology-related content such as technology, science and gaming news.

Examination structure

Important: the information and advice given here are based on the examination structure used at the time this guide was written. Please note that subject guides may be used for several years. Because of this we strongly advise you to always check both the current Regulations for relevant information about the examination, and the VLE where you should be advised of any forthcoming changes. You should also carefully check the rubric/instructions on the paper you actually sit and follow those instructions.

Remember, it is important to check the VLE for:

• up-to-date information on examination and assessment arrangements for this course
• where available, past examination papers and Examiners’ commentaries for the course which give advice on how each question might best be answered.

The assessment for this course is based wholly on an unseen written examination. The examination paper is three hours in duration and you are expected to answer three questions, from a choice of six. You should ensure that you answer all three questions, allowing an approximately equal amount of time for each question, and attempting all parts or aspects of a question.

The Examiners attempt to ensure that all of the topics covered in the syllabus and subject guide are examined. Some questions could cover more than one topic from the syllabus since the different topics are not self contained and will require you to refer to many aspects of the syllabus. A Sample examination paper appears at the end of this subject guide.

The Examiners’ commentaries contain valuable information on how to approach the examination and so you are strongly advised to read them carefully. Past examination papers and the associated commentaries are valuable resources when preparing for the examination.
Examination advice

Answer the question asked
Your answer needs to address the question asked and not another that you have seen on a past exam paper or that you would prefer to answer. To avoid this mistake, it is useful to clearly identify the precise question you are answering from the outset. Similarly, you should also define the key terms relating to that question. It is helpful to the Examiners if, in the first paragraph, you briefly indicate what your answer to the question will be; the main points you will put forward in support of this position; and the order in which these will be discussed (this is often called ‘signposting’; for more on this tactic see Structure below).

Support ideas with examples
Wherever possible, provide concrete examples and illustrations so that your answer is based upon solid empirical evidence. This evidence can be provided by, among others: defining key terms and concepts; citing a particular event, decision, policy, etc. to back up a generalisation; providing dates whenever possible; and, of course, referring to the relevant material provided in the Essential reading.

Structure
To the Examiners, the structure and coherence of your argument are just as important as your knowledge and understanding of the syllabus. To help organise your thoughts quickly, it is always sensible to compose an essay plan before you actually begin writing. In this way you will know in advance what you are going to say and in what order, which will make the writing easier. Your answers should always include an introduction that identifies the question, defines key terms or concepts, and provides ‘signposts’ so that the Examiners can follow your argument in the main body; a main body which develops your answer by discussing the key points on which it is based and supporting these with examples; and a conclusion which recaps your answer and offers final reflections (why the question is important, further implications of your answer, etc.).
Chapter 2: E-business technology and infrastructure

Aims of the chapter
The main aim of this chapter is to provide you with a brief introduction to the information and communications technology (ICT) underlying e-business. While it is essential to build up a basic conceptual foundation in the technology, in order to appreciate the technological possibilities and constraints, you should be careful not to become obsessed or blinded by technological detail. Technology is but one of the essential components of e-business. Key concepts in this area are:

• networks and the internet
• networking standards
• the web
• web 2.0
• peer-to-peer networks
• cloud computing
• mobile computing and m-commerce
• technologies for supply chain management
• security technologies for e-business.

Learning outcomes
By the end of this chapter, and having completed the essential reading and activities, you should be able to:

• identify the different types of networks and explain their functions, as well as discussing the importance of network standards
• explain the structure and functioning of the web (in conceptual terms), including the technologies underpinning web 2.0
• discuss the concepts underlying cloud computing and mobile computing and explain how these relate to the internet
• explain the principles of the ICTs that are used to support supply chain management
• describe the (software) technologies that provide the security function in e-business systems.

Essential reading

Further reading
The Chaffey textbook covers the material in sufficient depth but the following textbooks are alternatives:


Additional resources

There are a number of UK magazine websites that you can use to keep up-to-date with technical developments and find out more about the detail of technology:

• Computing (IT security): www.computing.co.uk/categories/security

Introduction to e-business technology

This chapter explores the technical aspects of e-business technology, including standards (widely accepted norms or requirements that establish technical criteria and processes, often set by industry bodies), protocols (rules used by computers to communicate across a network), platforms (hardware or software frameworks that allow software to run), architectures (designs of information systems) and communications infrastructures (such as computer and mobile phone networks). We provide some descriptions of the key concepts and terms which you are expected to know and understand; however, you do not need to describe these in your examination unless you are explicitly asked to do so.

Networks and the internet

Individual computers consist of both hardware (input devices, output devices, memory and central processing units) and software (operating systems, utilities and applications). These form the bases of all computing activities. Connecting computers together involves forming networks. Networks are what make e-business so interesting: they open up exciting opportunities for communication, collaboration and markets. There are several types of networks. Some important ones include:

• local area networks (LANs) – a network covering a small physical area, such as a small office
• wide area networks (WANs) – a network that covers a broad geographical area
• virtual private networks (VPNs) – commonly used to secure communications through the public internet
• internetworks (e.g. intranets, extranets and the internet).

Note that these network types are not mutually exclusive. For example, the internet is both a WAN (because it spans the globe) and an internetwork (because of the protocols it uses).
Intranets are private networks that operate within organisations. These are used by businesses that want to restrict access to important or sensitive information. Intranets also aim to simplify access to information for employees. Extranets extend beyond the boundaries of companies to include suppliers, customers and other collaborators. Extranets are used extensively to support supply chain management (see Chapter 7 of this subject guide). Particularly interesting for this course is the internet, a so-called ‘network of networks’, which enables communication between millions of computers worldwide. As Chaffey (2009) explains, the internet can be understood as a large client/server system.

Client computers provide the interface to human users and perform local processing – think of your personal computer at home. Servers, on the other hand, are computers dedicated to providing services across the network. Email is an example of a service commonly delivered by servers.

Firewalls can be used to protect the security of information flowing over an intranet or extranet. Firewalls are software on servers where a company’s network interfaces with the internet. Firewalls are required to prevent unauthorised users from accessing private networks. We will pick up on the topic of security in Chapter 10 of this subject guide, but for now it is important for you to understand that good information security is more than a technical issue – social and organisational aspects are also central to appropriate information security.

Networking standards

The internet and similar networks are based on a set of technical communications protocols, where a ‘protocol’ is a highly restricted form of language shared by computers which enables them to communicate with each other. While you are not expected to learn the detail of the technical side of e-business, a basic understanding of certain protocols is necessary in order to appreciate what makes e-business possible and how it is changing.

The most important of these protocols are the Transmission Control Protocol (TCP) and the Internet Protocol (IP). These are usually written together as TCP/IP as they operate very closely together. The Transmission Control Protocol layer of TCP/IP breaks files into efficiently sized chunks of data, known as packets. Packets are units of data that are routed between an origin (often a server) and a destination (such as a client) on the internet. The Internet Protocol communicates these chunks of data using a technique known as packet-switching. Once they all arrive at their destination they are re-assembled into the original file (by the Transmission Control Protocol). Some important applications of TCP are email, file transfer and the web.

The web

It is important to understand that the internet and the web are not the same thing. The web is part of the internet – a very important part – but there’s more to the internet than just the web. The web is based on the Hypertext Markup Language (HTML) standard, which is how we publish information on web pages. HTML has many different functions, including hyperlinks, which allow users to move easily from one document or web page to the next.
For users to experience the web, they must have what is known as a web browser installed on their computer. This is a software application that permits them to connect to servers to access and view content online. Web browsers are becoming increasingly important applications because they are seen as being central to the future of the user's computing experience. In the past, web browsers were just one of many different software applications, including word processors and media players. However, the move towards what has been termed cloud computing means that activities such as word processing or the creation of databases are done through the browser, on servers in the ‘cloud’. We further explore the cloud computing trend below.

The Hypertext Transfer Protocol (HTTP) is a standard for transferring requests for the delivery of web pages from servers to browsers. The transfer involves sending and receiving packets of data. You will probably be familiar with HTTP from your experiences of surfing online, as all web addresses start with ‘http://’. The technical name for web addresses is a Uniform (or universal) Resource Locator (URL). What follows the ‘http://’ is known as a domain name. For example, the domain name for the London School of Economics and Political Science is ‘www.lse.ac.uk’.

Domain names are important because they provide a shortcut to websites online. All domain names map onto what are known as Internet Protocol (IP) addresses. For example, the IP address for the LSE is 158.143.96.8.

- **URL**: http://www.lse.ac.uk
- **Domain name**: www.lse.ac.uk
- **IP address**: 158.143.96.8.

You will probably agree that it is much easier to remember your favourite sites’ domain names than it is to memorise the numerous IP addresses, which is what makes domain name mapping so important. This mapping takes place as part of the Domain Name System (DNS) and is fundamental to the internet’s architecture.

Domain names are also important for companies from a marketing point of view. Many companies view their portfolios of domain names as brand assets. Imagine how many domain names Coca-Cola, a global company with a very recognisable brand, must register in all the different countries in which it operates (e.g. http://www.coca-cola.co.uk; http://www.coca-cola.com.sg; http://www.coca-cola-india.com; http://www.coca-cola.com.cn, and so on).

**Activity**

Go to http://www.lookupserver.com and find the IP address that corresponds to your favourite website’s domain name (e.g. facebook.com). This is called a ‘forward DNS lookup’. The reverse of this process is called, as you might have guessed, a ‘reverse DNS lookup’. What other information is made available in this process?

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**Web 2.0**

Recently there has been much discussion about the emergence of a new version of the web – **web 2.0**. Proponents argue that there are important differences between the original web, first popularised in the 1990s, and web 2.0. The original web was typically composed of static pages, written by a site’s owners or administrators, and infrequently updated. In contrast, web 2.0 is said to run on dynamic, user-generated content. It is supposedly more interactive and participatory than the old web, although
critics continue to debate these distinctions. The popular site Wikipedia, where users participate and collaborate to generate content, is a notable example of the new wave of websites that rely on user-generated content and governance. Other examples of web 2.0 type technologies include web logs (popularly known as ‘blogs’) and social networking sites. As these technologies present interesting opportunities and challenges for business and society, we devote Chapter 8 of this subject guide to a more comprehensive discussion of web 2.0. At this point, we will just consider the key technical issues.

From the technical perspective, web 2.0 is different in terms of the extent to which it relies on certain new scripts and technologies. There are two in particular – Javascript and Ajax – which we note here. (Note that you will not need to know how to use these for this course.)

Javascript is a scripting language used in web design to write functions that enhance user interfaces and the dynamics of web pages. Javascript makes pages more interactive by permitting, for example, a web form to validate that the information a user has entered into forms is acceptable before submitting it to a server. Javascript is behind most of the pop-up boxes that we encounter online. Ajax stands for ‘asynchronous JavaScript and XML’ (don’t worry about remembering that) and is a new approach to designing web applications. Ajax is actually a set of technologies, not a single technology, that work together to retrieve data from servers ‘asynchronously’ (that is, with no timing requirements for the transmission of data). It runs in the background and does not interfere with the display and behaviour of a web page. Whereas a typical web 1.0 page would require you to click a link or submit a form and then wait for a new page to load, Ajax allows users to update content on pages without leaving the page. To give you an idea of how these technologies are being used, web applications such as Googlemail and the photo-sharing site Flickr use Ajax, as does Amazon’s user-rating system.

Another web 2.0 technology that you should be aware of is the widget: a block of executable code that is installed within web pages. Importantly, this code is reusable, often written by third parties, and its content is ‘live’ and dynamic. Widgets are what make on-screen tools such as clocks, stock market tickers and flight arrival schedules possible.

Peer-to-peer networks

The traditional internet architecture is the client/server relationship described above, whereby user clients rely on servers to transfer data across networks. However, there are other ways to configure network relationships online. One such innovative architecture is known as peer-to-peer (P2P) networking. P2P networks are composed of users, known as peers, who share their computing resources with other peers, without the involvement of intermediaries such as network hosts or servers. Peers are thus both suppliers and consumers of resources. P2P networks are ad-hoc networks in the sense that new nodes (peers) can be added or existing ones removed without a significant impact on the performance of the network. These architectures are dynamic and distributed. Their distributed nature means that they are more robust than client/server configurations as there is no single point of failure in the system. Figure 2.1 below shows the basic difference between the client/server and peer-to-peer architectures. How do you think each model affects how organisations communicate, operate and coordinate work?
P2P networking was first popularised during the Napster\(^1\) period, when file-sharing first took off, and has yet to lose pace. History shows us that these new internet architectures arguably revolutionised the entertainment industry. While the use of peer-to-peer technology as a platform for distributing content such as music and video is very significant to e-business (see Chapter 11 of this subject guide), we must also consider the other business models and technology applications that can take advantage of peer-to-peer architectures. For example, Skype, the successful start-up company providing a free software application to make voice calls over the internet, runs on a P2P model. It uses P2P networks to transfer its Voice over Internet Protocol (VoIP) data from caller to caller.

Cloud computing

Related to peer-to-peer networking is the emerging concept of cloud computing. Cloud computing enables users to access and use web applications that reside in vast data centres located around the world instead of on their own personal computers. It is called ‘cloud computing’ because most network diagrams denote the internet as a cloud (see Figure 2.2 below). These applications based in the cloud are supposed to benefit from massive on-demand scalability and can be dynamically provisioned to achieve economies of scale, saving businesses money. Importantly, these resources are provided as a **service** over the internet and are often billed like utilities.

\(^1\) Napster was originally an online music file-sharing service which operated from June 1999 to July 2001. It was shut down over legal claims that it infringed copyright. Its demise led to new, decentralised P2P models for sharing files. The Napster brand was later sold to a file-sharing company offering a pay service.
In a way, cloud computing resembles previous network architectures. Recall the client/server relationship we covered before. Cloud computing is similar to the client/server architecture in that the 'cloud' consists of a series of high-performance servers that offer content. The difference between client/server models and the cloud computing model is that the software and the data reside on the servers in the cloud, and not on the client machines, as is the case with traditional client/server architectures. The reason for this is that companies offering cloud services believe that users want their information to be accessible from anywhere and available on multiple platforms: mobile phones; across computers at home and at work; and shared with friends, family and colleagues. The idea is to store everything ‘out there’ so that an employee or work team, for example, can access it whenever and from wherever it is needed. However, with the move to the cloud comes a new set of concerns regarding the possibility of network disruption and data not being available, the security of data that are stored in the cloud, user privacy and others.

Activity
Many free, web-based email services rely on cloud computing to store users’ data ‘in the cloud’ so that they can access it wherever, whenever. Webmail is just the tip of the cloud computing iceberg. What services do you regularly use that employ cloud computing solutions? For a start, think of all the different Google applications that you might use. These are based on cloud computing. What others are there? How would you go about finding out where and how their data are stored by the services?

Mobile computing and m-commerce
So far we have focused on information technologies in terms of personal computers. We typically think of computers as the machines that sit on our desks. However, recent developments in mobile phone technology mean that today’s mobile phones are effectively computers. This is interesting because it means that most of us have computers with us wherever we are. This realisation has led analysts to begin exploring the idea of mobile commerce, or m-commerce. There are a wide range of products and services that open up when we begin to treat the mobile phone as a networked computer:

• Mobile ticketing – the replacement of paper tickets with electronic tickets that can be sent to a mobile phone or personal data assistant (PDA) via a text message or short message service (SMS).
• Mobile vouchers – offering discounts to customers directly through their mobile phones. When combined with location-based services, mobile vouchers can be sent to customers as they pass certain retail areas.
• Location-based services – mobile phone service providers constantly triangulate a user’s location in a certain area and this location data can be used for marketing purposes (e.g. directing customers to a particular restaurant nearby).
• Mobile banking – using mobile phones to conduct basic banking activities such as transfers, balance checks and payments.
• Mobile marketing and advertising – marketing directly to customers through their mobile phones.

Think of some more examples of mobile commerce applications. Are there any limitations to mobile commerce that business should be aware of?
Activity

Consider the different computing technologies that we as consumers have access to, including desktop computers, laptops, netbooks, e-readers, smart mobile phones, MP3 players and digital cameras, and even recent gizmos such as the iPad. What are the main differences between these various technologies? How did you choose these points of difference? In what ways are these technologies similar to one another? Are we gradually moving towards ‘technological convergence’, whereby different gadgets perform the same computing tasks, or are there still important differences between technologies? Remember that our mobile phones are increasingly sophisticated devices, equipped with computer processors, digital cameras and internet capacity.

Technologies for supply chain management

As well as general-purpose technologies and architectures, e-business technologies are also applied in more specific situations; for example, in supply chain management. When extranets are used to coordinate and manage supply chains (see Chapter 7 of this subject guide), they often involve electronic data interchange (EDI). EDI is a generic term that refers to the structured exchange of data or documents between organisations using information technology. It is a format that pre-dates the internet, with various international technical standards. And despite the current of innovation that has taken place in e-business over the past couple of decades, the EDI format is still widely used by many companies in their supply chain activities.

Radio frequency identification (RFID) is a so-called ‘automatic identification’ technology, which permits the identification of items without direct human intervention. Its predecessor, bar coding technology, relied on line-of-sight transmission of data along the supply chain and often required human beings to intervene in the process. However, by using radio signals, RFID can automate the product identification process, and thus promises many benefits to supply chain management.

RFID offers many potential advantages over previous supply chain technologies. For one, by automating the process, it can reduce labour costs. The RFID tags themselves allow significantly larger amounts of data to be stored on the products (e.g. serial number, colour, size, price), leading to better intelligence along the supply chain. Additionally, the tags increase inventory visibility for partners and improve response times to customer demands and market trends. RFID also permits asset tracking, which can help reduce shrinkage and, in the case of a product being recalled, allows partners to locate and remove faulty goods quickly. Depending on how it is implemented, RFID can help facilitate item-level tracking, whereby tags are stored in each individual product (as opposed to pallet or case-level tracking). Item-level tracking opens up many opportunities for increased intelligence along the supply chain, for example in terms of theft detection, stock monitoring and product customisation.

However, a decision to implement RFID at the item-level must be carefully considered. RFID tags can be expensive, although prices are decreasing as the technology matures. Consider that at any given time, there are thousands — if not millions — of products moving along the typical supply chain, and you will see that the technology costs can accumulate quickly. The reliability of RFID is also a concern, as certain metals interfere with the radio frequencies used by RFID. Thus, managers in some industries need to understand these technical limitations before choosing RFID for managing supply chains. For example, motorcycles are built with various metal components, and so item-level RFID may prove problematic for their supply chains. If you wish to read more about RFID, please refer to Angeles (2005).
Rubee is a similar technology to RFID, with some important differences. Whereas RFID relies on radio signals to transmit data, Rubee uses magnetic signals, enabling it to transmit data through both metal and liquid. This makes Rubee useful for the harsh environments where RFID often fails, for example in warehouses where there are lots of metal structures. However, despite this major advantage, there are disadvantages to using the technology, including slow data transmission speeds and small packet sizes. Its relatively slow speeds make Rubee unsuitable for the warehouse environment where many products are moving rapidly through the building. Nonetheless, it is a technology that businesses are closely watching as a potential supply chain game-changer.

The advantages and disadvantages of using RFID or Rubee will always depend on the particular implementation. Organisations have different business objectives which affect their supply chain strategy. If speed or quality of product information is a concern, then perhaps RFID is a good option for supply chain managers. If keeping costs low or minimising information technology investment is a priority, then perhaps RFID is not the best way forward. In such a case, sticking with legacy bar code systems, for example, might make the best business sense. Or perhaps an older EDI-based system is best.

At the time of writing (2010), RFID is being introduced into various industries, such as fashion, clothing and fast-moving consumer goods (FMCG), but it is not in general use yet as, for example, some industries are still developing appropriate standards that are essential for communication.

A software technology that is particularly important to large organisations, both internally and for communicating along the supply chain, is that of enterprise resource planning (ERP) systems. These are large, complex suites of software that serve to integrate the various common functions (e.g. accounting, production, human resources) and data of an organisation. Considered as internal systems, these are of limited interest to e-business, which is fundamentally inter-organisational. However, using EDI protocols and extranets, the ERP systems of the companies along the supply chain can be connected together and hence can ‘talk to each other’ in order to provide seamless communication between the various departments of different companies. Cisco’s supply chain, for example, depends upon interconnected ERPs.

### Security technologies for e-business

Data security is a top concern for organisations, especially as they continue to invest in new e-business technologies. One important way to secure data is by encrypting it. Based on cryptography, encryption is the process of using algorithms (detailed sets of instructions) to make information unreadable to anyone except those who have special knowledge in the form of a ‘key’. This key makes information readable again, through a process called decryption. Encryption can be used to protect data as it moves around networks or while it sits on storage devices.

Businesses can use encryption in different ways. We’ve already mentioned VPNs, which often use encryption techniques. VPNs work by sending data through ‘tunnels’ over a shared public infrastructure, such as the internet. Other data cannot enter these tunnels unless they are also appropriately encrypted. VPNs are commonly used by employees of firms who are temporarily away from their home office, for example consultants at a client’s site, to gain access to the company’s internal networks.
Another business application that uses encryption is the **digital signature**. These are not actually signatures in the normal sense, but rather a way of using mathematical techniques to secure digital messages or documents. Digital signatures provide assurances to the recipient that a message is from a known sender, and that it has not been tampered with. These can be used in financial transactions or other environments where protection against fraud and forgery is important.

Transport layer security (TLS) and secure sockets layer (SSL) are protocols for transmitting information privately over the internet. These protocols have many important B2C applications. For example, many websites use them to collect sensitive information such as credit card numbers during online transactions. TLS and SSL use cryptographic techniques to allow client/server applications to communicate data so that the data are impossible to eavesdrop on or tamper with. You might be familiar with these protocols. If you’ve ever noticed how certain URLs start with ‘https://’ then you have experienced SSL in action.

We pick up on these security technologies again in Chapter 10 of this subject guide, where we elaborate on them and also consider how organisational, social, legal and institutional aspects of information security complicate e-business.

**Conclusion**

This chapter provides an overview of the main technological architectures for e-business. It describes the basic technological infrastructures which enable network technologies and explains how different protocols enable and support these architectures. Specific emphasis is given to the discussion of supply chain management technologies and to emerging phenomena, such as web 2.0. Security challenges and problems are introduced.

Most of the aspects discussed in this chapter will be complemented by additional material presented in the following chapters. This chapter provides an introduction to the background technological knowledge needed to understand more specific aspects of e-business discussed elsewhere in the subject guide.

**A reminder of your learning outcomes**

Having completed this chapter, and the essential readings and activities, you should be able to:

- identify the different types of networks and explain their functions, as well as discussing the importance of network standards
- explain the structure and functioning of the web (in conceptual terms), including the technologies underpinning web 2.0
- discuss the concepts underlying cloud computing and mobile computing and explain how these relate to the internet
- explain the principles of the ICTs that are used to support supply chain management
- describe the (software) technologies that provide the security function in e-business systems.
Self-test questions

1. Discuss the similarities and differences between the internet and cloud computing. What are the main business opportunities offered by cloud computing?

2. Mobile technologies offer new business opportunities. Discuss, with examples, whether mobile technologies can be a real substitute for traditional wired technologies.

Note: these self-test questions are not Sample examination questions. They are intended to help you test your understanding of the issues discussed above. Sample examination questions tend to draw on your knowledge of the issues covered in different chapters, whereas the self-test questions test your knowledge of the chapter in which they appear.
Chapter 3: Economic theories of e-business

Aims of the chapter

The principal aim of this chapter is to explore the economics of e-business markets and, through the use of transaction cost theory, to show how e-business technology impacts the organisation and structure of markets. In particular, we discuss the phenomenon of disintermediation, where traditional intermediaries (or ‘middlemen’) are eliminated through the introduction of e-business. Key concepts in this chapter include:

- the transaction cost model
- types of transaction costs
- ICT and disintermediation
- the myths of the dot.com boom.

Learning outcomes

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

- explain transaction cost theory and identify the main types of transaction costs
- analyse the impact of e-business technology on transaction costs
- explain how and why disintermediation occurs in electronic markets
- discuss the impact of e-business technology on the organisation of markets with examples from the real world
- explain the ‘myths’ that were current during the dot.com boom.

Essential reading


Further reading


Introduction

The purpose of this chapter is to introduce the most common theories that have informed the management and economics of e-business. The chapter will mainly focus on transaction cost theory and conceptual approaches to intermediation and disintermediation. In order to match the literature on the theories, in this chapter we refer to e-business technology as ICT (information and communication technology) and hence you should treat these terms as being synonymous.

The main economic theory you need to understand is the transaction cost model. Examining how markets are organised and how and why ICT can be designed and implemented to facilitate the functioning of market mechanisms, we discuss the fundamental factors that produce electronic markets. We therefore present and discuss a limited version of transaction cost theory, focusing on those factors that affect the exchange of goods and services in a market context. We discuss the circumstances under which ICT can make market mechanisms more efficient. For a more detailed presentation of transaction cost theory, you can refer to Ciborra (1993) and Williamson (1985). Cordella (2006) presents a useful discussion of the application of transaction cost theory to information systems and we recommend that you read this article.

The basic assumption of transaction cost theory is that economic agents (buyers and sellers) face costs to make the exchange of goods and services possible (see Picot et al., 1997). These costs are not necessarily reflected in the price at which goods and services are exchanged. These costs, called transaction costs, are mostly related to information processing costs: not all the information needed by buyers and sellers about the object of the exchange is available; it is costly to process the available information, etc. We identify the different types of information processing costs that individuals face, namely search costs, contracting costs and control costs. We also elaborate on how ICT might contribute to lower transaction costs, which, in turn, makes the exchange of goods and services more efficient, and therefore improves the overall efficiency of the economic system within which these exchanges take place.

After introducing the basic elements of transaction costs, we discuss how ICT can affect the roles of the different economic agents involved in the exchange of goods and services. Disintermediation is a typical example: this is the process by which the number of economic agents involved in an exchange (i.e. resellers, wholesalers and mediators) is reduced. Disintermediation typically occurs because ICT does for free what intermediaries do for a fee. Following the transaction costs argument, ICT provides better opportunities to process information related to the exchange, reducing the need for support for buyers and sellers in managing the essential information needed for the exchange.
ICT therefore reduces the need for third party services and hence the costs faced by buyers and sellers. The first reason why disintermediation occurs is therefore rooted in transaction cost theory. Moreover, building on Picot et al. (1997), we discuss how and when ICT-led disintermediation occurs.

The transaction cost model

In the transaction cost model, markets are viewed as organisational structures which coordinate buyers and sellers by matching the reciprocal expectation related to the price-quantity/quality relationship. The transaction (exchange) is therefore coordinated on the basis of a contractual arrangement which specifies buyers and sellers, the object of the exchange and the price at which the transaction will take place. If you take as the elementary unit of analysis the transaction or exchange between at least two individuals, you can envisage the information-related problems that create uncertainty regarding the object of the exchange and the relationship between price and quantity/quality, which is fundamental to the decision of the two parties to engage in the transaction. Looking at the transaction as the unit of analysis, we can identify how and where ICTs can be used to facilitate access to this information and why ICT can be used to reduce the transaction costs. If you consider the market as a network of exchanges and contracts between buyers and sellers, both cooperation and conflict should be taken into account because individuals might withhold information during the process of exchange. This in fact can generate extra profits and higher revenues for either buyers or sellers.

Every business activity is characterised by a certain amount of uncertainty and this may stem from the task, the technology or the environment. However, the transaction cost framework considers another, rather distinct, form of uncertainty, namely behavioural or strategic uncertainty, which has its origins in the conflict of interests that exists between buyers and sellers. The information that buyers or sellers receive or gather may well be unreliable, with the result that they have to undertake excessive information processing in order to evaluate its reliability. The fact that information is obtained from human sources means that it cannot be trusted a priori. In fact, humans can exploit the use of information to obtain extra profit. This strategic consideration is due to the fact that interdependent strategic intents are affecting the exchange and use of available information. Buyers and sellers cannot be seen as solo chess players whose only opponents are the technology, a random environment or nature. Put differently, in order to pursue individual interests, buyers and sellers are willing to manipulate, omit or even distort information to gain extra value from the exchange. In so doing, they ‘pollute’ the information setting within which the exchange takes place.

Needless to say, this generates the need to invest in sophisticated solutions to double check information. Buyers and sellers cannot trust the information that is exchanged, so they have to invest in solutions that reduce the risk of becoming exposed to ‘polluted’ information. This leads to an increase in transaction costs, which explains the design of information systems that aim to make more reliable and transparent the information exchanged between buyers and sellers. As we discuss below, specific intermediaries – infomediaries – become highly relevant to facilitating transactions in situations where complex information settings make it difficult for buyers and sellers to finalise the exchange.
Types of transaction costs

The transaction cost model assumes that the market is a bundle of transactions or exchanges between individuals who behave so as to optimise their revenues from the exchange. The transaction cost model defines this behaviour as opportunistic. As noted above, transactions entail costs in terms of resources that need to be deployed to complete an exchange of goods or services between the parties (i.e. buyers and sellers). Hence, transaction costs reflect the imperfections of the market mechanism in allocating resources on the basis of the price-quantity relationship. There is always some information-related problem that makes it difficult, and therefore expensive, to finalise the transaction. You may view transaction costs as the economic equivalent of friction in physical systems: the higher the friction in a physical system, the more the system's movement is impeded. By the same token, the higher the transaction costs, the lower the degree of economic activity occurring in the market. Costless transactions only take place in an ideal world where there are no friction, impediments or barriers to the immediate perception of the equity of the exchange (i.e. perfect knowledge of the price-quantity/quality relationship).

Factors that may contribute to the cost of a transaction in the real world can be identified as follows:

- Searching for the product or service in question, as well as for the 'true' price at which the sale/purchase ought to take place. There are two types of search costs: (1) the costs associated with searching for the actual product or service, and (2) the costs involved in determining the best price at which the product or service could be bought.
- Carefully crafting the contract that regulates the exchange, so as to avoid later claims.
- Monitoring its execution so as to pinpoint responsibilities and penalties if modifications have to be made to the original contract.
- Finally, checking the reputation of the partners in order to minimise subsequent surprises related to the undiscovered properties of the transaction.

These costs are generally defined as the costs of gathering information, evaluating alternative options, negotiating and contracting. They are the consequences of the complexity and uncertainty of the economic system. Uncertainty and complexity can be related to either human behaviour or environmental or unpredictable events.

More specifically, we may group the information-processing costs related to transacting through negotiation of an exchange into four main classes:

- **search costs**: the costs necessary to set up the minimal social unit for the exchange (i.e. identify the party with which one wishes to conduct the transaction)
- **contracting costs**: the costs related to the negotiation of the terms of the trade and drawing up the contract which regulates the exchange
- **control costs** and **regulation costs**: these costs relate to the implementation of the contract under conditions of uncertainty, the policing of deviations from the contract terms and the enforcement of sanctions to restore conditions suitable to the terms agreed.
Each of these affects a segment of the transaction lifecycle, which can be divided into three stages:

- search
- contracting
- control/regulation.

In the transaction cost model, we may conceive of information technology as a **mediating technology** because it mediates the transactions or exchanges between the parties. Information technology can reduce the costs of transacting (i.e. the information costs) because it enables more information to be communicated in the same amount of time. Information technology can also contribute to better linkage between buyer and seller, as well as more efficient and effective contracting processes between the parties through brokerage effects. However, considering that the increased amount of information being communicated in the same time unit might increase the information processing costs that the transacting parties need to endure, information technology does not necessarily lead to lower transaction costs.

In the transaction cost model, information technology is seen as a factor that can decrease the costs of transacting, thus improving the functioning of the market or sustaining market-like forms of organisation. The logic behind this argument is that the lower the transaction costs, the more efficient the market will be. The more you use information technology, the lower the transaction costs and, therefore, the more efficient the market will be as an allocation mechanism.

The strength of the transaction cost perspective is that it offers a compact set of concepts and a unifying language to analyse and interpret a variety of micro and macro phenomena, such as vertical integration between firms, employment contracts and internal labour relations, anti-trust laws and interventions, and even the emergence and failure of economic institutions.

Nevertheless, it has two major limitations. First, transaction cost economics is based on a sophisticated but still narrow view of the agent as ‘economic man’, who maximises utility despite the limits of their rationality. Therefore altruistic behaviour, for example, is beyond its scope. Second, the approach presents a static, comparative view of why different economic institutions exist, develop or decay. Transaction cost economics suggests that, for a given level of uncertainty and trust between the parties, there are usually a limited number of governance structures that are efficient and will survive in the long run. When circumstances change, an efficient governance structure must adapt swiftly or it will be swept away by competition. The approach is silent, however, on the forces that make certain economic organisations stickier than others. In sum, transaction cost economics seems to assume an implicit notion of frictionless change. It ignores the widespread role of transition costs in socio-economic organisations undergoing continuous change.

**Activity**

Consider this problem: if coordination costs encompass both transaction costs and information processing costs, could information technology raise coordination costs despite reducing the transaction costs? Discuss in detail how this might occur, justifying your answer with examples.
ICT and disintermediation

Traditionally, disintermediation in this context has been seen to occur when ICT implementations enable economic agents to bypass third parties and directly engage in economic activities with their counterparties. In the context of the web, it has come to signify the disappearance of a wide variety of ‘middlemen’, or intermediaries, and the creation of an enhanced sales network in which customers deal directly with service providers. The result is supposed to be a ‘frictionless economic environment’ that reduces both inefficiencies and transaction costs.

Understanding the impact of e-commerce on intermediaries requires an appreciation that:

- ICT supports many business activities and, as a result, it can lead to changes in market configurations; in particular, it changes the role of intermediaries in matching supply and demand.

- ICT can reduce transaction costs by eliminating the need for intermediaries that used to make the transaction possible: disintermediation occurs because ICT does for free what an intermediary does for a fee.

![Figure 3.1: Progressive disintermediation of a consumer distribution channel](image)

Chaffey (2009) Chapter 2 demonstrates the costs saved in a conventional producer-wholesaler-retailer-consumer value chain by, first, disintermediating (eliminating) the wholesaler and then, secondly, disintermediating both the wholesaler and the retailer. In the latter case, the price to the consumer becomes the same as that charged originally by the producer to the wholesaler and is less than half the old price that the retailer charged the consumer. This happens because ICT can reduce search costs, contracting cost, control and regulation costs through facilitating the exchange of information between economic agents (described by Malone et al., 1987 as ‘electronic communication effects’) and because it makes it easier to match buyers and sellers (Malone’s ‘electronic brokerage effects’).

There are therefore valid economic incentives for both producers and consumers to bypass intermediaries and push them out of the value chain. Intermediaries add significant costs to the value chain and, by suppressing them, the profit margins of producers can increase while at the same time offering lower prices to consumers. Advanced uses of ICT and the
evolution of electronic marketplaces have reduced the transaction costs for producers, thus enabling them to internalise activities that had to be served by intermediaries in a traditional market. This has created the opportunity to distribute profits within the value system by driving the intermediaries to extinction. Under such a scenario, producers can benefit from increasing their profit margins and passing part of their savings to consumers who thus enjoy lower prices and greater choice.

**Infomediaries**

Infomediaries are profoundly affected by the adoption and diffusion of ICT in markets. ICT changes the way in which information is accessed and therefore allows agents to bypass traditional intermediaries to execute transactions. It must, however, be noted that a new form of intermediation is emerging alongside the wide adoption of ICT. Electronic markets are characterised by a very rich information setting which, in certain circumstances, makes it difficult to find the right information needed by the agents. If you are looking for information on a specific product, you will find it difficult to identify the right website to support your search without the use of a search engine such as Google. Search engines are intermediaries which reduce the cost of gaining access to and using information. These intermediaries, given the nature of their task, are defined as information brokers or infomediaries (Hagel and Rayport, 1997). Chaffey (2009) Chapter 2 discusses the role of these new intermediaries and describes in detail their different forms and business models. You should refer to Table 2.5 in his book, where he distinguishes the various types of portal and electronic marketplace. Here we discuss in greater detail the reason why the importance of these intermediaries is increasing in the digital economy while, in the same context, traditional intermediaries are becoming disintermediated.

In the previous section, we discussed how ICT can reduce transaction costs by reducing search, contracting and control costs. However, we also argued that ICT can lead to situations where the increased amount of information being communicated might increase the information processing costs that the transacting parties need to endure. This is the context where infomediaries become very important and gain business opportunities. ICT in fact generates new transaction costs which have to be borne by the economic agents in the e-business context. These new transaction costs are generated by the increasing amount of information that has to be processed to conclude a transaction. In e-business the number of buyers and sellers is normally greater than in the traditional market. Buyers can buy from any digital seller so that place and time boundaries become irrelevant. Similarly, sellers can access buyers located all around the world. This increases the search, contracting and control costs. Thus, many potential buyers and sellers have to match their interests, negotiate the terms of the exchange and enforce forms of control in order to be sure that what has been agreed upon is effectively exchanged.

ICT therefore has a twofold effect. On one side, ICT reduces the need for traditional intermediaries but, on the other hand, it creates opportunities for new intermediaries such as infomediaries. It is in fact possible for specific intermediaries to reduce transaction costs facilitating the exchange, retrieval and processing of the information needed to exchange goods and services in electronic markets. These intermediaries act as infomediaries (information intermediaries) as they intermediate the exchange, use of and access to information. By reducing the information costs they provide valuable support to electronic markets.
Infomediaries are therefore a new type of intermediary which is very important in e-business as they make it possible to manage the rich information environment within which electronic transactions take place. Without infomediaries it would be too complex to manage transactions in digital markets: the search, contracting and control costs would become too high. Infomediaries reduce the transaction costs created by the increased volume of information produced in the digital economy. Infomediaries are therefore specific intermediaries which help to reduce specific transaction costs typically found within e-business.

Case study

Chaffey (2009) in Chapter 2 includes a short case study of lastminute.com (Case Study 2.2). This is a good description of who set up lastminute.com, why and how. It tells of the vagaries involved in setting up a 'new' venture but, of more interest here, it also discusses transaction value. lastminute.com was an inspirational idea that reduced transaction costs for consumers while at the same time providing an avenue of revenue for supplier companies that was not possible before intermediaries like lastminute.com.

Read the case study and then flip to Table 2.5 in Chaffey (2009). Skim through the various intermediary types listed in the table and think through where you would place lastminute.com and why. Is it a search engine – if yes, then what sort? Or do you think it is more a marketplace? Does it help you to compare prices? Look at the examples provided in the same table by Chaffey (2009) to give you some help. It might help to think about what service and value this site brought to its customers: was it simply lower prices or some other added value?

Activities

1. Identify examples of infomediaries that you regularly use or have come across – do not just copy the ones listed by Chaffey (2009). What roles do these infomediaries play? How important are those roles to e-business?
2. Consider the impact of online grocery shopping on the value chain. Does it disintermediate? Or has it brought forth new intermediaries (or infomediaries)?
3. Identify examples of where ICT does not disintermediate the value chain. Why is this so?

Myths of the dot.com boom

While transaction cost theory provides a real insight into the way that markets changed as a result of the introduction of e-business, you should be careful not to use it in an excessively deterministic way. Like all economic theories, transaction cost theory has certain assumptions built into it and those assumptions may not always hold in the real world. It is surprisingly easy to exaggerate the predictive power of any theory. People, especially consumers, do not always behave like 'economic man' and they do not always change their behaviour to adopt beneficial innovations immediately. Moreover, if you look elsewhere in economics, you will find various examples of 'manias' or speculative bubbles where investors force up the price of shares in a particular company or sector way past their real value. A good example of this is the dot.com boom of the late 1990s when e-business was touted to revolutionise whole industries overnight.
Howcroft (2001) provides a very good analysis of this phenomenon and you should read her paper carefully. In particular, she highlights certain ‘myths’ that were prevalent at the time of the boom. These were:

- the myth of the new economy
- the myth of success
- the myth of the entrepreneurial geek
- the myth of the level playing field
- the myth of innovation
- the myth of the virtual
- the myth of the online shopping experience.

Looking back now, it is very easy to poke fun at some of the myths; for example, the myth of the level playing field. Large companies will always have more resources to plough into their websites than smaller firms. On the other hand, the myth of the online shopping experience is less laughable, as the years go by and B2C e-business becomes more widely accepted.

Conclusion

This chapter provides the theoretical background to the study of many aspects of e-business. It ties in with the ideas of transaction cost economics and disintermediation to provide an analytical framework for the study of the economic impact of ICT on markets. The chapter explains, from a macro level perspective, the impact of ICT on the value chain and explains how and why disintermediation occurs. It will be clear as you work through the rest of this subject guide that these concepts underpin many e-business strategies.

A reminder of your learning outcomes

Having completed this chapter, and the essential readings and activities, you should be able to:

- explain transaction cost theory and identify the main types of transaction costs
- analyse the impact of e-business technology on transaction costs
- explain how and why disintermediation occurs in electronic markets
- discuss the impact of e-business technology on the organisation of markets with examples from the real world
- explain the ‘myths’ that were current during the dot.com boom.

Self-test questions

1. In the context of a B2B transaction, what are the main classes of information processing costs? Give specific examples of each of these costs, using the example of a shop buying Christmas trees from a supplier. When, and how, might they be incurred in this case?

2. How can transaction cost theory explain disintermediation and infomediation?

3. Outline the ‘myths’ that circulated during the dot.com boom. Which of these do you believe were completely unfounded, and could never become a reality?
Chapter 4: Business-to-consumer (B2C) systems and strategies

Aims of the chapter

The aims of this chapter are to provide a summary of the basic concepts of business-to-consumer (B2C) e-business and to examine the lessons learnt from more than 10 years of experience in this area. B2C is a relatively mature field that has seen a number of high-profile commercial successes, as well as various failures. Key concepts in this area are:

- business models and revenue models
- revenue strategy issues
- understanding shoppers
- website usability and design
- case studies (of mature and successful companies)
- failures
- problems
- key success factors
- innovation.

Learning outcomes

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

- identify the business models and revenue models of individual B2C companies, as a prelude to further analysis
- analyse the revenue strategy issues that pertain to any given B2C operation
- identify the roles of website visitors to any particular site
- analyse why some websites are successful in terms of consumer adoption and purchases, while others are less successful
- distinguish the quality of different websites in terms of their usability from the perspective of consumers
- advise B2C start-up companies concerning the factors that are important for success in this highly competitive field.

Essential reading


Further reading


Additional resources

• For papers on various topics in e-business, including B2C, see the MIT website: http://ebusiness.mit.edu

• The European Commission maintains a useful website with reports on B2C (and B2B) implementation within the European Union: www.ebusiness-watch.org

• One of the leading writers on web usability is Jakob Nielsen, whose publications are available at www.useit.com/jakob/publications.html

Introduction

The start of commercial web-based e-business is usually dated back to 1995 at the very beginning of the dot.com boom. The business-to-consumer (B2C) retail market was the first to be targeted. The glamour of online retail beckoned and e-business entrepreneurs flocked to try to grab a piece of the action, backed by thousands of investors. In that year, companies like Amazon, eBay and Yahoo began operations and, at the time of writing (2010), these ‘old giants’ are still forces to be reckoned with in the market, albeit in varying degrees of financial health.

As B2C dates back to the mid-1990s, we can no longer say that it is a new phenomenon, although in many parts of the world it began much later. However, we would argue that it is not a ‘mature’ commodity, like much of IT (e.g. personal computers). Rather, it is well established but still evolving. It is a recognised sales and marketing channel for, among others, air tickets, books, computers, groceries and share trading, such that it is the first port of call for many consumers in these markets.

How big a slice of the total retail market belongs to e-business? This is a difficult question, as statistics vary. It all depends on what you consider comprises the total retail market and how you count it as well as the e-business part. The figures currently given for the UK and USA vary between around 5 per cent and 17 per cent but, even at the lower end of the scale, you can see that e-business makes up a substantial proportion, although the forecasts swirling around the dot.com era that by 2015 it would account for over half of all retailing are likely to remain pipedreams. Nevertheless, the statistics from Data Monitor (2009) shown in the table below are impressive (see also Fomin et al., 2005).
Chapter 4: Business-to-consumer (B2C) systems and strategies

### Table 4.1: Recent statistics concerning the B2C market

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>UK</th>
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</thead>
<tbody>
<tr>
<td>Market value (2007)</td>
<td>$142 bn</td>
<td>$29 bn</td>
</tr>
<tr>
<td>Increase over 2006</td>
<td>24%</td>
<td>35%</td>
</tr>
<tr>
<td>Forecast (2012)</td>
<td>$277 bn</td>
<td>$90 bn</td>
</tr>
<tr>
<td>Forecast increase over 2007</td>
<td>96%</td>
<td>205%</td>
</tr>
<tr>
<td>Market segmentation</td>
<td>19% electronics</td>
<td>41% books, music, videos</td>
</tr>
<tr>
<td>Market segmentation (2)</td>
<td>USA has 65% of global online retail market</td>
<td>UK accounts for 39% of European market</td>
</tr>
</tbody>
</table>

Business models and revenue models

Certain basic business models are widely used to classify B2C companies and operations:

- ‘Pure play’ refers to companies, such as Amazon, that only operate online while clicks-and-mortar companies, such as Tesco, operate using both channels. Pure play companies have the advantage of being able to specialise in e-business and focus on their online offerings while clicks-and-mortar companies have the advantage of co-specialised assets (e.g. shared warehouses, economies of scale and their existing brand power and consumer base).

- Vendors (e.g. Tesco) sell directly to consumers while brokers (e.g. online travel agents) match buyers and sellers.

- Vendors sell either content (e.g. Financial Times) or products or services (e.g. e-banking).

- Similarly, they are to a greater or lesser extent specialised (niche suppliers for highly specific markets) or generalised (e.g. Amazon).

- They may employ electronic distribution (e.g. iTunes) or physical distribution (e.g. Tesco).

- Their website may offer only information about their products or services or carry out transactions or provide long-term after-sales support.

Revenue strategy issues

Three issues are especially pertinent to B2C, compared to conventional retailing:

Channel conflict and cannibalisation

This occurs when the new online sales channel does not attract new business but merely ‘cannibalises’ (takes sales away from) an existing channel (e.g. a firm’s traditional shops). The online channel may be cheaper per transaction for the firm but two channels are necessarily more expensive to operate than one. One solution is to move resources away from the conventional channel, but this may mean a reduction in service quality (fewer staff, reduced opening hours) and a consequent loss of revenue. A good example of this is banking. With online banking, should banks close branches, reduce opening hours and cut staff in branches, or tolerate the increased costs of the additional channel?
A possible strategy is to examine the value proposition for the various customer segments and differentiate the channels, setting incentives and constraints to persuade particular segments to shift to a particular channel.

**Alliances**

Online retailers may have considerable expertise in the design and operation of websites, and perhaps in one particular product line (e.g. Amazon and books), but they have the capacity to sell other product lines (e.g. electronics). A common strategy is for the online retailer to partner with a **category manager** with expertise in, say, electronics. Similarly, **order fulfilment** involves the online retailer providing the customers while the partner attends to distribution and logistics.

**Customer acquisition**

Unlike conventional stores that have a physical presence on the high street and can attract passing trade, B2C e-business relies on extensive advertising and marketing efforts to attract customers to the website.

**Understanding shoppers**

In any retail operation, it is essential to understand shoppers (or consumers), but B2C e-business is arguably slightly different from conventional retailing. For example, website visitors may be less likely to purchase products or services, compared to most conventional shops. Just because people visit a website does not mean they are likely to buy a product. These visitors have various roles, partly because accessing a website is much easier than having to spend time and energy travelling to a conventional shop.

**Roles of website visitors**

- **Browsers**
  
  These visitors are ‘just looking’; they are very unlikely to buy. They may be **surfers** who like to surf around the web, looking for entertainment, or **seekers** who require particular information but are unlikely to pay for it.

- **Buyers**
  
  They already know exactly what they want and they are ready to make their purchase. Typically they require quick, easy service.

- **Shoppers**
  
  They are interested in the product (e.g. a digital camera) and will probably buy one eventually somewhere. They usually require product reviews, comparison tools and feature lists to help them decide which product is the best for them.

People obviously change roles, depending on the context, but those described above are the main roles. However, researchers have identified additional roles:

- **simplifiers** – want convenience
- **bargainers** – want the best deal
- **connectors** – want social contact
- **routiners** – regular visitors to a site for news and general interest (e.g. sports fans who follow a particular team and like a daily/weekly update on their team’s progress).
Focusing on the shoppers, it is important to realise that **shopping is not the same as procurement**, where the latter concerns companies purchasing raw materials, components or consumables as part of their everyday business operations (see Chapter 6 of this subject guide).

Shopping is much more a leisure activity – some (but not all) people enjoy shopping. It is often a social or family activity where part of its function is meeting friends, who are also shopping. This may be the one occasion when a family regularly goes out together. Walking around the shops is a useful source of exercise for those with sedentary occupations. Furthermore, it can be a source of sensory stimulation (e.g. a modern boutique or music shop), as well as a source of status and authority, where consumers expect to be ‘served’ by shop assistants and, in some cultures, haggling over prices is normal. Shopping can also be seen as a subtle part of a person’s identity construction as we are all influenced by the products we purchase and the retailers we frequent. It often gives us particular pleasure to be seen by the neighbours as we carry home bags from fashionable (perhaps expensive) shops. Finally, conventional shopping normally provides an opportunity to examine (or try on) goods, as well as providing the immediate satisfaction of receiving the goods straight away.

All these aspects of shopping are extremely difficult to replicate online and represent a formidable barrier for B2C e-business to overcome. Nevertheless, B2C offers an attractive channel:

- for those who are particularly ‘cash rich and time poor’
- where travelling to the particular shop is very difficult
- where the type of shopping is rarely pleasurable (e.g. groceries).

### Reasons for consumer adoption

As Chaffey (2009) Chapter 1 explains, B2C companies need to be able to innovate with new technologies to create a buying experience for customers that will foster increased buying online (see also Riggins, 1999). In other words, companies need to generate an **online value proposition** which doesn’t cannibalise their offline channel; instead it induces new customers to buy their goods and services.

Broadly speaking, value for customers can be created around what Chaffey (2009) calls the ‘Six Cs’:

1. **Content** – detailed content which has informational value that supports the buying process (either online or offline).
2. **Customisation** – companies need to find ways to tailor and personalise their wares for each customer. This can be quite targeted and also forms a part of marketing (see the next chapter of this subject guide).
3. **Community** – businesses can focus on the community around products and services, where consumers can discuss the strengths of the companies and their offerings as well any issues that might arise. Many companies use blogs, wikis and other forums, including Twitter (see Chapter 8 of this subject guide), to create a community but also as a device to gather information on their customers and what they like (or don’t like).
4. **Convenience** – one of the oldest but probably key arguments in favour of online buying is the ability it gives consumers to choose, buy and, in many cases, use products at any time – the classic ‘24 × 7 × 365’ availability of a service.
5. **Choice** – online selling has opened up more possibilities for sellers to differentiate themselves but it also gives more choice to consumers. Tesco, and indeed other supermarkets, allows consumers to buy food and drink online but at the same time also offers insurance, mobile phone contracts, travel, etc.

6. **Cost reduction** – companies often offer lower priced items online, which is a strong mechanism for encouraging sales. We tend to take it for granted now that items and services purchased online will be less expensive than those bought offline.

Alongside creating value, companies must also keep in mind other factors that influence online buying behaviour. We discuss these in the next section.

### Consumer buying behaviour

Various factors either encourage or hinder consumer online buying. They include:

- **Ease of use and responsiveness**, including personalisation and the attractiveness of the site. This is usually summarised as the ‘buying experience’.

- **Trust, security and privacy** – this issue is particularly important in e-business as surveys suggest that fears in this area – more than any other – deter consumers from buying from websites. Because of its importance we devote a whole chapter of this subject guide (see Chapter 10) to security issues.

- **Product, price and branding**.

- **Fulfilment** – the efficiency of distribution and the facilities for returning unwanted goods.

- **Information quality** – information about the offerings needs to be comprehensive, accurate, up-to-date and easily accessible.

- **Consumer** – characteristics of the consumer such as personality, culture, risk aversion, lifestyle and inertia all impact on buying decisions.

It follows that websites need to be designed carefully if they are to achieve significant sales. Lohse and Spiller (1998) relate the design of B2C websites to that of conventional shops and this is a useful article to read. In particular, usability is important – if the website is difficult to navigate, then customers will inevitably go elsewhere.

### Website usability and design

Seminal work in the area of website usability was carried out by Jakob Nielsen, who defines **usability** as a ‘quality attribute that assesses how easy user interfaces are to use. The word “usability” also refers to “methods for improving ease-of-use during the design process”’ (Usability 101 1, Nielsen). The key issues of usability are as follows:

- **Usability is a design issue** – an attractive site is likely to gain customers, while a poor site will damage a firm’s reputation and sales.

- **Design for website visitors/customers** – this implies that the company knows the characteristics, needs and expectations of their customers.

- **The buying experience and website atmosphere** – the site should be easy to use, without being dull. The use of graphics, videos and animation should support the buying experience and not be a distraction. The limitations of computer screens, including mobile phones, need to be considered.

• The web is not mass media, nor is it exactly personal contact – it falls somewhere in-between.

Design goals vary according to the context but may include:

• Creating an impression consistent with the organisation's desired image, which could be youthful or well-established, exciting or secure, zany or efficient, etc.

• Allowing visitors to experience the site in different ways and at different levels (e.g. it should cater for both regular customers and first-time visitors).

• Providing visitors with a meaningful, two-way (interactive) communication (i.e. it should provide relevant information to visitors but also obtain data about them for marketing purposes).

• Sustaining visitor attention and encouraging return visits.

• Offering easily accessible information about products and services and how to use them.

• Encouraging trust and loyalty.

To achieve the aim of increased sales, certain design guidelines are often recommended. We sum them up here again:

• ensure simple, fast access to information

• provide simple, clear, consistent navigation

• avoid jargon and excessive propaganda

• acknowledge the need for multiple languages (including navigation) as not everyone speaks English

• avoid unpleasant colour combinations, too small text and irritating pop-ups.

Design decisions typically imply trade-offs, usually between originality, simplicity and functionality. For example, functionality (especially excessive functionality) often implies complexity (the opposite of simplicity), while originality (implying unfamiliarity) may not be simple or particularly functional.

Chaffey (2009) Chapter 11 categorises website design under three different forms: site, page and content design.

Site design and structure

This refers to the overall structure of a site. Chaffey (2009) discusses site style, organisation and navigation schemes where style refers to the 'personality' of the site. If it is a formal message for a formal audience, then the site should reflect the same attitude. Much of this sounds like common sense, yet the internet is full of websites that are poorly constructed, with little content and the wrong personality for the audience and content. Site organisation refers to organising the content in a clear manner which lends itself to some obvious categorisation – for instance, sorting product ranges alphabetically. Finally, site navigation explains how users can navigate their way from one page to another (or back again) in an easy flow. There are basically two approaches to creating a flow: narrow and deep implies less information on each page but provides links to other pages, while the broad and shallow approach has fewer pages but each one contains a lot of content. This is a design issue and each company needs to assess how best to help customers navigate their website.
Page design

This refers to the layout of each page. Attention must be given to the title, navigation and content. Chaffey (2009) explains that page elements, the use of frames, resizing, consistency and printing are issues that the designer needs to keep in mind when creating the e-business B2C website.

Content design

The key point here is never to include too much information on one page, use hyperlinks to give the reader a choice about exploring content further without unnecessarily crowding the page with too much content, and set out content in small, readable chunks of text that can be scanned easily.

Any new website design should be prototyped and tested with real users, just to evaluate their reactions. Ives and Piccoli (2003) demonstrate how a good knowledge of users can inform website design, while Treiblmaier (2007) discusses the evaluation of websites. Although there are many, often fairly obvious, design guidelines (see Usability 101, Nielsen), it must be remembered that artists break the rules. In other words, exceptional website designers can and do fail to follow what appear to be obvious guidelines and yet, through their design talents, they still manage to produce exceptionally attractive and innovative designs (e.g. www.agencywork.com.my/nokia2600; www.nexteinstein.org; and www.adultswim.com/music/ghostlyswim/index.html)

Activity

Look up a few different B2C websites (perhaps include a supermarket) and try to find one particular piece of information on each site. Then assess how many ‘clicks’ it takes you to find the answer, and also classify the site as ‘narrow and deep’ or ‘broad and shallow’. Try a simple question like ‘What is the company’s postal address?’ or something more complicated like ‘How many choices of a particular product (e.g. breakfast cereals) are currently available?’.

Case studies

The best way to become familiar with B2C is by getting to know the companies and their websites. As the market is directed at us, the consumers, this could not be easier. There are no passwords to worry about and it is recommended that you spend some time just browsing around B2C websites that interest you. As many of these companies have quite a long history (in internet time), it is also very worthwhile reading about how they started, the story of their growth and the particular value propositions that they offer customers. These stories are well documented in Chaffey (2009).

A good case to start with is Amazon.com. Here, in Case study 12.1, Chaffey (2009) emphasises how Amazon makes extensive use of metrics to drive their whole business. Remember also that Amazon is an excellent example of long tail economics, the shift from mass markets to niche markets (Chaffey, 2009, Chapter 8). Because the company does not have to hold physical stocks of books, it can offer a vast catalogue of titles (much larger than even the largest traditional bookshop) and previously unprofitable transactions become profitable using e-business. Whereas even a large conventional bookstore only offers 130,000 top titles, at one point, one-third of Amazon's book sales came from outside these top 130,000. Note also how Amazon has branched out from books to music, electronics, clothing, web services and even (in the USA) luxury
foodstuffs. Interestingly, Jeff Bezos, the founder of Amazon, said in an interview some years ago that the secret of the company's success is not the business model or the website but efficient inventory management.

Another pioneering B2C company is Dell Computers (Chaffey, 2009, Case study 8.2), which offers customers a build-to-order service, so that the computer is built according to the customer's specification. Dell manages this process highly efficiently, representing a triumph of 'information over inventory'. In an interview, Michael Dell attributed Dell's success to 'consistent execution' (in other words, repeatedly getting it right) through world-class manufacturing.

A sector that has been transformed by B2C is the travel industry – see Chaffey (2009) for case studies of Lastminute (Case study 2.2) and easyJet (Case study 8.1). This transformation has been so successful that it has been calculated that B2C accounts for more than half of the total US travel market. Customers are increasingly happy to research their travel plans online and make their own bookings, without any personal contact with a traditional travel agent.

Another case study well worth reading is that of eBay (Chaffey, 2009, Case Study 1.3), which is remarkable not just for the facilities it provides consumers to sell unwanted goods, but also for the way it has extended over the years from auctioning second-hand goods to selling new goods at fixed prices. Today tens of thousands of small businesses in Europe rely on eBay as a sales channel.

Activity

By searching their websites, discover and compare the mission statements for Amazon.com, Dell Computers, easyJet and eBay. What are the respective value propositions of these companies?

B2C failures

In addition to high-profile success stories, B2C has also been characterised by business failures. Chaffey (2009) describes the problems of Boo.com in Case study 5.3. Another failure was the US company Fingerhut (see Phan et al., 2005 for a clear narration of the story), which had been a very successful mail-order catalogue retailer since the 1950s. Part of its success was due to its sophisticated use of IT, including extensive data mining and database marketing. Its move into B2C e-business and credit cards in 1998 was welcomed by Fortune magazine, which regarded the company as 'one of the ten companies that get it'. Shortly afterwards it was acquired by Federated Stores, a US chain, but then things started to go wrong. Fingerhut's traditional customers were largely 'sub prime' (low income) and at the time they were not e-business users. Nor were they particularly creditworthy, which affected their ability to use credit cards. At the same time, Fingerhut lost control of its IT systems, such that IT failures began to hit order fulfilment, peaking during the crucial retail period of Christmas 1999. The company lost trust and credibility, sales dropped and the business closed down in 2002, although it was revived later.

Another interesting failure was UKeU, a UK e-learning initiative launched in 2000. Most of the £50m investment was spent developing the software for the learning platform and insufficient attention was paid to developing a business strategy. This type of operation has high fixed costs, payable up-front, and the failure to attract more than 900 students, against a target of 5,600, saw the project scrapped.
B2C problems

Unproven business models
Any business has to have a reliable revenue stream and eventually to make profits — it took companies like Amazon a number of years before they showed a profit. Investors will not wait forever.

Discount environment
Consumers expect discounts and bargains through B2C and in this environment, large sales volumes and strict cost control are needed.

Cost-efficiency problems
B2C is not necessarily efficient and cost effective, compared to traditional retail. Much depends upon the product market. Nowadays consumers expect attractive websites, backed up by superior support and distribution networks and these are not cheap. Hence, compared to the dot.com boom, entry costs (and operating costs) are no longer low.

There’s not always a global market
Different countries have different cultures, preferences and regulations, such that a product that is a best-seller in the West may be unacceptable elsewhere. For example, alcohol is prohibited in many Muslim countries and its transport across state borders is a problem in parts of the USA, as a firm called wine.com found out to its cost.

Security and privacy overheads
B2C retailers have to be particularly careful to maintain high (and expensive) levels of website security to prevent customer details (e.g. credit card details) being accessed illegally.

Channel confusion and cannibalisation
As discussed above, B2C is a new channel and if it is merely ‘cannibalising’ customers from existing channels, it is unlikely to be successful.

Key success factors
With so many B2C websites, covering a multiplicity of different markets, it is impossible to identify specific success factors, as these are highly context dependent. Product and service markets vary considerably among industries and regions of the world. However, there are a number of high-level factors that do seem consistently important:

Innovation
In most cases, B2C is competing against traditional retail operations and, in order to encourage customers to switch away from the familiar traditional channels, the new B2C operation must offer something extra and innovative. This could be the personalisation and reviews offered by Amazon, the build-to-order of Dell or the convenience and discounts of easyJet. In addition to these well-known cases, there are myriad smaller companies, offering innovative solutions in highly niche markets, from Chinese cosmetics to concert tickets and from violin repairs to virtual pets.

Understanding shoppers
It is essential, as we noted above, that B2C retailers build up a good understanding of the different types of consumer (segmentation) and their needs, expectations and purchase behaviour. Please see also the following chapter of this subject guide on e-marketing.
Understanding the product and the industry

As we have argued, the success of B2C is highly context dependent and it is essential that B2C retailers have a good understanding of the products or services that they are offering. Some products are very easy to individuate (e.g. a particular book has a title and an author), others are much more difficult (e.g. potatoes). Products with well-known (and well understood) features, such as electric kettles, are easier to sell ‘at a distance’ than innovative, highly novel products which the consumer will really want to examine before buying. The latter is also the case with ‘high touch’ items such as clothing.

Consumers are usually happier buying very expensive products (e.g. cars) through traditional channels with their personal touch, although they often research the features of such products extensively on the web before making a purchase. Where a purchase is time critical (e.g. medicine for someone who is ill) or where the product is widely available on the high street, it is difficult for B2C to compete.

As we have already remarked, where physical products are concerned, B2C retailers have to worry about logistics (including inventory control, distribution and returns) as much as their conventional counterparts. Similarly, they need to understand the industry structure in terms of dominant brands, competitors’ strategies and industry regulations (especially in, say, the pharmaceutical industry). As we discussed in Chapter 3 of this guide, e-business often leads to a widespread restructuring of the industry in terms of disintermediation and infomediation and B2C retailers need a good appreciation of such structures and the changes taking place.

Understanding the technology

Consumers expect the website to be available ‘24 × 7 × 365’ and any extended downtime is likely to result in a significant loss of business. Hence, B2C retailers need to be expert in all aspects of hardware and software, especially in understanding the limitations and vulnerabilities of particular components of their technical system.

Activity

The South London Museum of Art, a small local museum, has a website that only provides basic information, such as opening hours and location. The director feels there must be a way to use it to increase revenue. How would you approach this problem? What would you advise her?

Conclusion

B2C e-business is growing and maturing; in industries like travel, this has happened rapidly. Nevertheless, opportunities for innovation remain, although many of these have taken on the flavour of web 2.0, social networking and user-generated content (discussed in Chapter 8 of this guide). Furthermore, growth can be unpredictable, as can be seen from Amazon’s diversification away from books, eBay’s move into fixed-price new goods and Google’s transformation from a search engine into the world’s largest advertising agency (see the following chapter of this guide). This implies that B2C retailers need to be flexible and agile, especially when the critical success factors are often hidden and may reside more in logistics and manufacturing than IT (see the cases of Amazon and Dell referred to above).
A reminder of your learning outcomes

Having completed this chapter, and the essential readings and activities, you should be able to:

• identify the business models and revenue models of individual B2C companies, as a prelude to further analysis
• analyse the revenue strategy issues that pertain to any given B2C operation
• identify the roles of website visitors to any particular site
• analyse why some websites are successful in terms of consumer adoption and purchases, while others are less successful
• distinguish the quality of different websites in terms of their usability from the perspective of consumers
• advise B2C start-up companies concerning the factors that are important for success in this highly competitive field.

Self-test questions

1. Why do you believe that business-to-consumer (B2C) e-business has grown steadily in countries such as the UK? Illustrate your argument with examples.

2. Companies engaged in business-to-consumer (B2C) e-business need to understand shoppers, technology and their industry. Discuss with examples.

3. In business-to-consumer (B2C) e-business the critical success factors may be hidden and the growth path unpredictable. Discuss with examples.