

# PREFACE

It has almost become a cliché, nowadays, to say that Information Technology (IT) and Information Systems (IS) are all-pervasive throughout society – but it is actually true. In fact, virtually all businesses use IT and IS in their administration systems and IT is an integral part of the production equipment on the factory floor. Many people have computer equipment at home, carry personal IT equipment when they go out (for example, a smartphone) and IT is built into many consumer durables. The interface between the public and organizations is also mediated by the use of IT: indirectly through call centres, or directly by networked systems. Additionally, IT is an essential component of many of the services we use – for example, the electronic tills in shops, the information displays at the railway station and the electronics built into the aeroplanes we fly in.

IT, and the IS it supports, do not exist in isolation but are linked using Communications Technologies – together we refer to this as Information and Communications Technologies (ICTs). These technologies allow business organizations to work together more effectively: the use of networked IT integrates the business systems of organizations with those of their supplier and customer organizations. The use of the Internet is part of this and it also allows more and more people, with their home computers and their smart phones, to communicate with one another and with organizations across the globe. Facebook is, in effect, one of the busiest social spaces of the early 21st century – it is founded on an impressive IS and IT infrastructure (see the *Facebook case study* on page xxi).

For people everywhere, the ability to access and use IT is a part of their job and their everyday life. The need to use IT systems should be accompanied by an understanding of the technologies involved and the uses to which they are put. Governments throughout the world have recognized these imperatives and have promoted IT awareness in schools, in further and higher education and through adult, lifelong learning schemes.

This book examines IS and IT from a business perspective. Staff, at all levels in organizations, need to understand IT and the IS it supports. The efficient use of IS is essential to the everyday operations of an organization. The innovative application of IS and IT can be key to the achievement of competitive advantage.

The subject area of Information Systems, for business and computing students, includes a study and understanding of:

- Business/organizations – their aims, management, structures and methods of working
- Information Systems and their use within organizations

- The Information Technology used in Information Systems
- The process and techniques of analysing and designing an Information System
- The professional, legal, social and ethical issues involved in the application of Information Systems and Information Technology.

## Contents

The book starts, in *Part 1*, by explaining the fundamental importance of IS to businesses and organizations. There is a danger that our notion of IS and IT is limited by our experience of the ubiquitous PC. Corporate IS is much more than that – this is illustrated, in *Chapter 1*, by an extensive case study of the use of IS in the supermarket business.

The use of IS in supermarkets affects all areas of the business: the everyday operation of the shop floor, support functions and management; and it also extends outside the organization down the supply chain and out to the customers who use the e-Shop. In *Chapter 2*, we look at the use of IS in terms of business models and we develop the IS Business Model that we will use throughout this book.

The final chapter in Part 1 examines IS management. For many organizations IS and IT are the responsibility of the IS department – we examine the roles and responsibilities of that department in *Chapter 3*. Alternatives to (or variants of) the central IS department are to decentralize, outsource or offshore IS and IT functions – these business aspects of IS management are also examined.

In *Part 2* we examine some commonly used Information Systems. Corporate Systems exemplified in *Chapter 4* are payroll and order processing. e-Business systems are discussed in *Chapter 5* – this includes the examination of the three e-Commerce technologies: electronic data interchange (EDI), e-Shop and e-Markets. These examples of IS are used to emphasize how complex corporate IS is and to examine issues such as usability, security and competitive advantage. As established in the IS Business Model, these systems impact all levels of the organization and its exchanges with customers and partner organizations.

Information Systems process business transactions using Information Technology – the nature and application of IT is the topic of *Part 3*. Computers and IT are the topic of *Chapter 6*.

The Information Systems, which run on the IT, take input data, compute and then output information. In *Chapter 7* we examine the design of the data capture and the requirements for information output (as business transactions and management information). The processing part of the IS involves the use and updating of stored data – *Chapter 8* looks at files and databases with an emphasis on the design of the underlying data structures.

Networking is a vital part of IS provision – it enables the systems to be used from the desktop and/or a remote location. It also provides interfaces

between systems, organizations and the general public. Networks are the topic of *Chapter 9*.

The IS provision of an organization is vulnerable. As the IS has become both more dispersed and increasingly vital to the effective functioning of the organization, the topics of privacy and security and resilience have become ever more pressing. Computer security is also examined in Chapter 9.

Central to the IS function is the analysis and design of Information Systems; this is the topic of *Part 4*. There are a number of tasks involved in creating an IS – these can be organized and understood using a system development lifecycle (SDLC). The SDLC is one element of an IS development methodology. These issues are examined in *Chapter 10*.

The design of an Information System is heavily reliant on graphical techniques. In *Chapter 11* we will study use case, data flow, entity relation, sequence and class diagrams. This gives students a good toolbox of IS diagrams (and hopefully it creates a literacy in diagramming techniques which should be useful across all areas of business studies).

Finally we take a brief look at the remaining stages in the SDLC. In *Chapter 12* we sketch an overview of what happens in the programming, testing, implementation and maintenance.

In *Part 5*, the last section of the book, we examine the role of IS in society. Computing only dates back to the Second World War and the internet opened for commercial use in the mid 1990s. The extensive application of IT has created challenges in areas such as privacy, computer misuse and the environment; these are examined in *Chapter 13*. The all pervasive application of IS and IT, including mobile technology, has brought about radical social and business changes, that are summed up in the expression the Information Society – the object of *Chapter 14*. This chapter also discusses careers in IS – possibly this can help you when planning your future career.

## Supporting teaching and learning resources

This book includes a range of pedagogical features that are intended as a means to support students and lecturers.

**At the start of each chapter:** Each chapter opens with a short summary outlining the chapter contents. These summaries are also accompanied by a *Learning outcomes* section, setting out the key learning goals for students, and by a list of the *Key terms* introduced in the chapter.

**Throughout the book:** Extensive use is made of *Case studies* to illustrate the business, IS and IT topics being discussed. The *Facebook case study* on p. xxi introduces a number of topics that are analysed in the book. The extended *Supermarket case study* in Chapter 1 outlines the way in which IS function in an organization and is referenced throughout the book. The chapter on the system analysis and design toolbox includes further case studies to illustrate the techniques being taught and for use in exercises and assignments.

A number of *Themes* are highlighted that are particularly relevant to the business use of IS. These themes are: usability, security, outsourcing and competitive advantage. A further theme is the IS Business Model developed in Chapter 2 – this serves to remind us that the benefits of IS must be applied to all areas of the organization as well as in its business interchanges with other organizations and members of the public.

Moreover, a few specific topics that might be of interest but are not essential to the understanding of the subject are examined in separate *Explanation boxes*.

Finally, some chapters include *Managing Information Systems in the 21st Century* boxes, linking to video interviews with IS practitioners especially recorded for this book (see p. xxii).

**At the end of each chapter:** Each chapter includes a *Further reading* section, which can be a starting point for further research. A *Comprehension test* will help students check to what extent they have absorbed the chapter contents. A number of *Exercises* are also designed to aid the understanding of the material presented in each chapter. These exercises can be used for self-study, while selected discussion questions can be used for tutorial discussion.

**At the end of the book:** A comprehensive *Glossary* defines all the key and technical terms in the book, and an *Index* helps students and lecturers looking for specific topics.

## Online resources

A number of additional online resources are available to lecturers and students using this book. Students have free access to:

- The *Managing Information Systems in the 21st Century* videos
- Extra MCQs for self-test
- An **Additional topics** section including updates from the author
- **Online glossary**.

Lecturers have access to a password-protected section of the website, including:

- A comprehensive **Test-bank** of questions for use in exams, tests and quizzes
- **PowerPoint lecture slides** for each chapter, which lecturers can edit for their own use
- An **Instructor manual** providing guideline answers to the exercise questions in the book.

These resources can be found at: [www.palgrave.com/business/whiteley/](http://www.palgrave.com/business/whiteley/).



**Case Study**  
**Facebook**

The social networking site, Facebook, was launched in 2004 and by 2012 had in excess of 900 million users.

For the user, Facebook is a website. Users put up a personal profile and link with other users as friends. It is common practice to have a personal photo gallery and many users will update theirs on a regular basis. Users can check out what their friends are doing and exchange messages (with other individual users or selected lists of friends). Special interest groups can also be set up; sometimes they are used for campaigning purposes. Facebook is accessed from a PC or a smartphone (and there is, of course, a Facebook app). Social networking sites are a significant component of the Information Society, see **Chapter 14**.

For Facebook the content is provided by the users, not by the site owners who simply supply the platform. It is an example of the participatory web – see **Chapter 5** for a discussion of Web 2.0.

An issue for Facebook users is privacy (although not all Facebook users are necessarily that bothered). The personal profile users set up on Facebook is shared with friends. Users can use privacy settings to govern what is shared with whom, but this can be complicated and Facebook seems to keep changing the policy. For Facebook the information set up by users has commercial value: it can be analysed, sold to third parties and it is used to target advertising. Information can also end up being shared with governmental authorities – the US authorities are users of Facebook data – see **Chapter 14** for a discussion of civil liberties in the Information Society.

The Information System and Information Technology behind Facebook are impressive, although the company is not keen to publish much detail. The development team consists of several hundred engineers (developers) using a very agile approach – see **Chapter 10**. Apparently an engineer will volunteer to take responsibility for a project and see it through from start to implementation, in a short space of time. There is a high performance culture and engineers who don't deliver will be eased-out. On the IT side, the system uses a massive number of servers, reportedly 60,000 in 2011. Facebook has two massive server farms in the US with a new one planned for Luleå, Sweden, to take advantage of the cool temperature and renewable energy – see **Chapter 13** for a discussion of green computing.

The idea of Facebook was dreamed up by Mark Zuckerberg with some of his fellow students at Harvard in 2003. The initial incarnation was limited to Harvard students, and was called Facemash – Zuckerberg then went on to develop the early version of Facebook in 2004. Some of Zuckerberg's collaborators on Facemash believed their ideas had been ripped off and the issue has been the subject of legal proceedings – see **Chapter 13** for a discussion of intellectual property rights.

Facebook is now a massive undertaking but the problem (for Facebook Inc.) is how to make money out of the traffic. The general idea is that advertisers on Facebook should be able to target relevant demographics (using the information users have put online) but this does not seem to be working. Click-through rates are, for example, a fraction of those achieved by Google adverts. In 2012 General Motors pulled out from paid adverts on Facebook. One of Facebook's problems is that it does not make any money out of mobile users, and many of its users are moving to their smartphones for access.

Over the years, Facebook has had a number of private investors. In 2012 Facebook sold a proportion of its shares as an initial public offering; the price for the shares that were sold implied an overall company valuation of \$104 billion (although the share price fell back after the sale was completed).

*Sources include: Filloux (2012), Gersmann (2011), Rushe (2012) and yeeguy (2011).*