Electronic Business

Geoffrey Sampson
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About the author

Geoffrey Sampson is a professor in the Informatics Department of Sussex University, where he teaches e-business. He was educated at Cambridge and Yale Universities. Before moving to Sussex in 1991 Sampson had taught at the London School of Economics and at Lancaster and Leeds Universities; at Leeds he held the chair of linguistics. Sampson has spent secondments at the Royal Signals and Radar Establishment (now Qinetiq), at the British Telecom Research Labs, and at the universities of Geneva and Cape Town.

Sampson's side interests include Chinese philology; his book Love Songs of Early China appeared in 2006.

Sampson has been a Member of the British Computer Society since 1988. His website is at www.grsampson.net.
## Abbreviations

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<thead>
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<th>Acronym</th>
<th>Description</th>
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<tr>
<td>APS</td>
<td>advanced planning and scheduling</td>
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<td>ASP</td>
<td>application service provider</td>
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<td>B2B</td>
<td>business to business</td>
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<td>B2C</td>
<td>business to consumer</td>
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<td>B2G</td>
<td>business to government</td>
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<tr>
<td>BI</td>
<td>business intelligence</td>
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<td>BPM</td>
<td>business performance management or business process management</td>
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<td>BPR</td>
<td>business process re-engineering</td>
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<td>C2C</td>
<td>consumer to consumer</td>
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<td>CITP</td>
<td>Chartered Information Technology Professional</td>
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<tr>
<td>CPA</td>
<td>cost per action</td>
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<td>CPM</td>
<td>cost per mille</td>
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<td>CPU</td>
<td>central processing unit</td>
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<td>CRM</td>
<td>customer relationship management</td>
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<td>EDI</td>
<td>electronic data interchange</td>
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<td>ERP</td>
<td>enterprise resource planning</td>
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<td>GBF</td>
<td>Get Big Fast</td>
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<tr>
<td>GPL</td>
<td>General Public Licence</td>
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<tr>
<td>HTML</td>
<td>hypertext markup language</td>
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<td>HTTP</td>
<td>hypertext transmission protocol</td>
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<tr>
<td>IISP</td>
<td>Institute for Information Security Professionals</td>
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<td>ISO</td>
<td>International Organization for Standardization</td>
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<td>ISP</td>
<td>internet service provider</td>
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<td>IT</td>
<td>information technology</td>
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<td>JIT</td>
<td>just in time</td>
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### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>M&amp;A</td>
<td>mergers and acquisitions</td>
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<td>MBC</td>
<td>meaning-based computing</td>
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<tr>
<td>MiFID</td>
<td>Markets in Financial Instruments Directive</td>
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<td>MMO</td>
<td>massively multi-player online role-playing game</td>
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<td>ODF</td>
<td>OpenDocument Format</td>
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<td>OSDL</td>
<td>Open Source Development Labs</td>
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<td>PC</td>
<td>Personal Computer</td>
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<td>PDA</td>
<td>personal digital assistant</td>
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<td>PDF</td>
<td>Portable Document Format</td>
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<td>PIP</td>
<td>partner interface process</td>
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<td>PKI</td>
<td>public key infrastructure</td>
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<td>PR</td>
<td>public relations</td>
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<td>RFID</td>
<td>radio frequency identification</td>
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<td>ROI</td>
<td>return on investment</td>
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<td>SaaS</td>
<td>software as a service</td>
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<td>SCM</td>
<td>supply chain management</td>
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<td>SEO</td>
<td>search engine optimisation</td>
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<td>SOA</td>
<td>service-oriented architecture</td>
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<tr>
<td>Sox</td>
<td>Sarbanes–Oxley Act</td>
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<tr>
<td>TCO</td>
<td>total cost of ownership</td>
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<td>UDDI</td>
<td>Universal Description, Discovery and Integration</td>
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<tr>
<td>URL</td>
<td>universal resource locator</td>
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<tr>
<td>VC</td>
<td>venture capitalist</td>
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<td>VoIP</td>
<td>voice over internet protocol</td>
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<tr>
<td>W3C</td>
<td>World Wide Web Consortium</td>
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<td>WAN</td>
<td>wide area network</td>
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<tr>
<td>WSDL</td>
<td>Web Service Description Language</td>
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<tr>
<td>XML</td>
<td>eXtensible Markup Language</td>
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<tr>
<td>Y2K</td>
<td>year 2000</td>
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Preface

This book is an enlarged and updated edition of one published in 2004 under the title *e.biz: The Anatomy of Electronic Business*.

The e-business field is so fast-moving that many topics covered at some length here were not mentioned in the original edition. The new edition is longer than its predecessor; nevertheless, to make room for important new topics it was necessary to omit two chapters on less central subjects. These are website design, and the impact of IT on smaller firms (Chapters 11 and 13 of the first edition). Computing degree courses typically include plenty of material on website design, so that it is not necessary to squeeze a brief treatment into a book about e-business. (The references I would recommend are Morville and Rosenfeld (2006) and Niederst Robbins (2006).) Although there are still special problems for small firms in coming to terms with the new technology (and the subject is discussed in this edition), technical developments such as the emergence of software as a service mean that these problems are no longer acute enough to merit a full chapter devoted to them.

Two points of terminology should be mentioned.

People who hear the term *e-business* sometimes ask ‘Is that the same as e-commerce?’ It is broader. *Commerce* refers to the trading activities that take place at the interfaces between company and company or company and individuals. *Business* includes commerce, and it also includes all the internal activities that enable a company to transform its inputs into its outputs. Information technology – ‘IT’ for short – is bringing about large changes in both these areas, and both are covered in this book. When I use the term ‘e-commerce’, this will refer strictly to trading across organisation boundaries.

It is often useful to contrast e-business with business as it was conducted before information technology introduced new business techniques. I call the latter *conventional* business, as in ‘conventional warfare’. Much successful business today is conventional in this sense.

At the publisher’s request, I have avoided using pronouns in ways that suggest that participants in e-business are always male, though the resulting turns of phrase are sometimes clumsy.

References to sources occur in two forms. When a quotation is taken from an ephemeral news report, for the sake of accountability the source is identified briefly in a footnote. In the case of publications with more
lasting significance, citations in Harvard style – e.g. Smith (2005) – link to the detailed reference list beginning on p. 245.

Many items cited are available online. Search engines have become so efficient that it does not seem worthwhile to specify URLs here other than in a few special cases. Where URLs are quoted, the prefix http:// is understood.

Sussex, August 2007
Introduction

SCOPE AND ASSUMPTIONS

This book is written to help computing students understand how their expertise is changing the nature of business.

This is a new topic. Businesses have used computers for decades. But, for most of that time, they were using the machines mainly to execute, more cheaply and/or quickly, the same processes that were previously carried out manually. Now, computers are often changing the content of what businesses are doing. Although there were isolated earlier cases, it is only for about 10 years that this has been true to any great extent.

Most books about e-business are written for managers who know about business and economics but are mystified by the new technology. This book is written mainly for readers, like my own students, who are at ease with the technical side of computing but may never have had occasion to think about business issues. I hope that businesspeople who come across the book may find it enlightening and helpful, but there is certainly material here that, to them, will seem too obvious to spell out. To computing students, basic economic or business concepts are not always self-evident. There is no reason why they should be.

Technical IT details will be avoided wherever possible in this book. Computing students study them in other contexts. Other readers will often prefer not to learn about them at all.

The book will look at developments worldwide, but its perspective will be centred on Britain and Europe. Unlike most computing topics, in e-business geography matters. And, for e-business, the UK happens to be a supremely significant market. By 2004 Britain had overtaken the USA to become the world leader in terms of the proportion of retail sales taking place online. Tesco.com is the world’s largest online supermarket, and is seen overseas as a model of innovation and business success. Britain has a higher proportion of households with broadband (47 per cent in 2006) than the USA (44 per cent) or Germany (33 per cent). The proportion of total advertising spending going to internet advertising in Britain is slightly higher and growing faster than in the USA (and it is far higher than the world average).

In a book about e-business, there is nothing parochial about a British perspective.

BUBBLE AND REALITY

Now is a good time to write this kind of book. For several years, the topic of e-business was under a cloud, as a reaction to the crazy overexcitement of the dotcom bubble period in the late 1990s – which ended in tears
when the bubble burst in 2000 and many startup companies went bust. In the immediately following years, any mention of e-commerce or e-business aroused instant scepticism. But e-business activity continued, and by about 2006 the public was beginning to notice that at last it was really working. The broadcaster Rory Cellan-Jones chronicled the collapse of the dotcom bubble in his 2001 book *Dot.bomb*; by May 2007 he was commenting ‘this time the internet companies are making money, not promises… The internet revolution that was promised in 1999 has arrived’.¹

At the end of the 1990s, the e-business atmosphere was irrational to an extent that is hard to credit, looking back. Investors were baffled by computer technology but were convinced that, somehow, there was a mass of profit to be made from the internet; in consequence, they were throwing a wall of money at anyone who came up with an e-commerce idea.

Daniel Levine asked the venture capitalist (VC) Guy Kawasaki about that mad time:

‘There’s a sense today that a few years ago all you had to do was sit down for a cup of coffee with a VC, jot down a business plan on the back of an envelope and you could walk out with a check for $30 million. Is that a myth?’ [Kawasaki:] ‘Well, it wasn’t that easy. You also had to boot PowerPoint, but that’s it. [laughs] … Much of that myth is true.’²

When the bubble burst and new-technology companies collapsed or saw their share prices fall to fractions of earlier values, some people concluded that e-business was a delusion. But the mere fact of numerous bankruptcies tells us nothing about the future of e-business: such things are usual with disruptive economic innovations. As David Manasian (2003) wrote:

In the 1870s America’s railroad industry boomed in much the same way as the world’s telecoms industry in the late 1990s, only to collapse in a similar heap of bankruptcies… A few years later … [railways] revived, changing American business for ever… In the first few years of the 20th century there were thousands of people tinkering with carmaking, most of whom went bust. A decade later only a handful survived, but the car was about to become the icon of progress.

E-BUSINESS RECOVERS

By now, not only is the technology moving ahead, but share prices of technology companies have in many cases become healthy again.

² ‘One-on-one with Guy Kawasaki, CEO, Garage Technology Ventures’, *San Francisco Business Times* 29 March 2002.
Already in 2004, the sober and penetrating *Economist* magazine was reporting that

> ... the wild predictions made at the height of the [dotcom] boom – namely, that vast chunks of the world economy would move into cyberspace – are, in one way or another, coming true.\(^3\)

Figure 1.1 displays the growth of total UK online spending over the past 10 years. The trend is rising, at an increasingly rapid rate. (Note that there is no sign of the pace having slackened around 2000–1, when post-bubble gloom was deepest.) In January 2008 it was reported that online spending accounted for 15 per cent of total UK retail spending in the year just ended, up by more than 50 per cent over the previous year. For spending by businesses, the 2007 online proportion was 27 per cent. ‘For the first time ever, money spent by UK shoppers on the web eclipsed the turnover of Tesco.’\(^4\)

Conventional retailers are beginning to suffer from online competition. In 2005, British retailers worth £3 billion went bankrupt; the analyst Nick Gladding believed that competition from e-commerce was a significant factor in a third of cases.


The Swiss food and drinks firm Nestlé had some ‘unique’ features that were seen as so crucial to company culture that they were published to staff as things that would not be changed when a new chief executive arrived in 1997. One was that ‘IT would not play much of a role in the day-to-day running of the firm – Nestlé’s focus on its people, products and brands would continue to be far more influential.’

But by 2004 the need to remain competitive forced Nestlé to abandon this sacred cow. It partnered with the German software company SAP in an ambitious attempt to boost operating efficiency by shifting activities on to an electronic ‘resource planning’ platform.

Ten years ago, companies’ annual reports to shareholders contained little or nothing about their use of IT, partly because that was seen as sensitive information that ought not to be revealed to competitors, but partly also because few shareholders would have understood or cared. Now, shareholders in leading companies are demanding to know that their organisations are making the most of enterprise IT. (Confidentiality is becoming less important, because it often appears that competing firms all gain more from common computing infrastructures than any single firm can gain by going it alone electronically.)

THE IMPORTANCE OF OPINION

Now that the exaggerated enthusiasm of the bubble period, and the exaggerated negative reaction that followed, are both in the past, it might seem futile to dwell on them. But they make a good illustration of the importance of opinion in business.

In technology, all that matters is what objectively is the case. If people think that something works differently from how it actually does work, then too bad for what they think. In business, opinion matters fully as much as objective realities. The value of a thing, for instance, is nothing other than what people think it is – the benefits that they currently expect it to yield in the future. The expectations may prove quite wrong, but there is no alternative, ‘objective’ measure of value. Yet, without value, there would be no business.

A LEARNING PROCESS

As I write, we are not yet 14 years from commercialisation of the internet. (Some legal constraints on acceptable internet use were relaxed in 1990, but significant commercial exploitation began only in late 1993–early 1994.) For the business world, those years have been an intense learning experience. All business life is a process of discovery, as managers try out ideas about how to become or remain profitable in the face of ever-changing

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economic conditions, customer requirements, initiatives by competitors and so forth, and the customers’ responses show whether the ideas are good or bad. But the internet – and IT in general – is such a large-scale break from the past that the experimentation process has been unusually challenging. Some assumptions that seemed obviously correct, in the early years of e-commerce, have turned out to be just wrong. Only now are we reaching a phase where some central questions about e-business have been answered fairly solidly, and the continuing learning process may perhaps begin to feel more like ‘normal’ business life.

As one clear example of this learning process, consider website design. In the early years of e-commerce, it was an accepted truism that the success of a website was tied closely to its aesthetics. A website should make a powerful visual impact. Depending on what type of business it served, it should be exciting, or graceful, or impressive – but certainly not just bland. The man who rapidly became recognised as the leading authority on website design was David Siegel – his book *Creating Killer Web Sites* became the best-selling single title (on any subject) on online bookshops after the first edition came out in 1996, and was translated into 10 languages. Siegel offered all kinds of tips for giving websites a ‘wow!’ factor. He urged web designers to ‘turn a site from a menu into a meal’. He wrote: ‘Web pages will sing, they will dance, they will be alive with movement.’ At a period when few home users had broadband connections, sites designed according to Siegel’s principles were often very slow to load, but that just did not seem important relative to aesthetic considerations. This was not irrational: many business experts believed that the value of websites lay in creating brand images, rather than scoring high on search-engine rankings or actually selling goods.

But it turned out that users did not merely treat findability, efficiency and convenience as higher priorities than aesthetics; they often actively disliked sites that prioritised aesthetic considerations. In an interview with Siegel in 1998, the *Sydney Morning Herald* commented:

> Siegel told the *Herald*: ‘I am not trying to win any design awards for my clients any more.’ We have discovered that e-business websites are about fitness for purpose – not art.

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The most respected web design guru of the present day is Jakob Nielsen, who emphasises *usability* rather than aesthetics. In 2003 Nielsen recalled that, up to 1999, usability advocates were ‘roundly booted at internet conferences and ignored by the prevalent “killer design” agencies’. As a result, e-commerce sites often failed to achieve business benefits. After the turn of the century the consensus changed, but according to Nielsen:

> … the damage done during the early years was so bad that four years of progress have been insufficient to bring us to an acceptable level. Basically, the first 10 years of commercial web sites were a lost decade with very few designs that truly worked for customers.

This is just one clear and striking example of how we have gradually been learning how business can exploit the possibilities created by IT, through experimenting and seeing what works and what does not work. We shall never stop learning. But we have come through the early growing pains. Dimly, we may now be able to discern the outline of longer-term trends.


People who talk about ‘dotcoms’ usually mean companies that sell to the public – although the URL .com domain is not restricted to retailers. Figure 1.1 showed that e-business activity in this business-to-consumer (B2C) area is on a strongly growing trend. But B2C sales – e-tailing – are only one part of the picture.

When the World Wide Web first arrived, B2C was where the excitement lay. Partly, this was because the directness of communication between individual customers and retailers was genuinely the thing about the web that represented its biggest single innovation from a business point of view. Largely, though, it was for the more superficial reason that B2C commerce is the aspect of business that is directly visible to journalists and other opinion-formers.

Any business is an operation that takes in various goods and services as inputs, and turns them into (normally more valuable) goods and/or services as outputs. Things bought by consumers represent the ends of long *value chains* that trace back ultimately to unprocessed raw materials; normally, many companies will have played successive parts in the process by which raw materials are turned into consumer goods. B2C trading is the very last step in the series of transactions that get a good or a service to a consumer, and it is preceded by a long series of business-to-business (B2B) transactions. One American estimate puts total B2B market size at 10 times the size of the B2C market.

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7 Nielsen quotations taken from David Neal, ‘Good design pays off’, *IT Week* 19 May 2003.
B2B trading via the internet never became the stuff of a media feeding frenzy, as e-tailing was; but the evidence seems to be that B2B is actually a more important aspect of e-business, not merely in terms of helping buyers and sellers to find each other but also in terms of allowing established business relationships to function more efficiently. The value of online B2B sales in Britain in 2004 was three times online B2C sales, and growing faster.

Some people distinguish a further category of business-to-government (B2G) trading – trading where government is the customer has features distinguishing it from both retailing and selling to private-sector organisations. Governments, at the national and local level, have recently been among the principal forces driving e-business forward.

**BUSINESS PROCESS RE-ENGINEERING**

The impact of IT is not limited to the interactions between companies and other companies or individuals – *e-commerce*. It is also affecting the internal processes by which companies do their work of transforming inputs into outputs. *Business process re-engineering* (BPR) has been a management buzzword for some years, and often it refers to reorganising business operations in ways that are not related to computing in particular. But one important area of BPR involves using IT to run businesses in ways that would not have been possible with manual methods: that is how the term BPR will be used in this book.

(For the difference between ‘commerce’ and ‘business’, see the preface.)

Thomas Malone (2004) describes how British Petroleum (BP) addressed a need to reduce its total greenhouse-gas emissions by 10 per cent over the 12 years from 1998. Discovering a pattern of modifications to the company’s existing manufacturing operations that would enable that target to be met, while minimising any adverse consequences for the company’s costs or productivity, was itself work that BP needed to execute – purely internal, managerial work, but very important work.

Conventionally, senior managers would have set target emission reductions for each of BP’s many business units, and then adjusted the targets through a cumbersome, time-consuming (and hence expensive) process of bargaining, as unit managers argued that their particular targets were unrealistic. Instead, the company simply issued managers with permits to emit so many tons of carbon dioxide or equivalent annually (with the total number of permits matching the reduced goal), and let the managers trade the permits with one another via a company-wide electronic trading system. A unit that saw an easy way to reduce its emissions would sell its excess permits to a unit that needed a larger allocation. The result was that BP accomplished the task of adjusting its operations very rapidly (the overall 10 per cent emission reduction was achieved in 2001, nine years early), saving a large amount of managerial work via a technique that would not have been feasible without IT.
This is just one example of how IT is now allowing businesses to run their internal operations in ways that were not possible before. Business process re-engineering is not about permit-trading in particular, but about all kinds of ways in which computers are changing the nature of firms' internal activities.

Business process re-engineering is even less publicly visible than B2B e-trading, let alone B2C e-tailing; and because BPR is not about things being sold, there is no straightforward way to quantify it and measure year-on-year change as one can with B2B and B2C e-commerce. Furthermore, IT-based BPR tended to develop a little later than e-commerce. But many observers suggest that of these three aspects of e-business – B2C, B2B and BPR – the most significant of all may be BPR.

ABANDONING PRECONCEPTIONS

E-business is a topic that contrasts in flavour with the typical computing student's intellectual background, and it will be as well to spell out some of these differences. This will involve an element of caricature in portraying the 'default' computing student; not all students in this field are alike, any more than students in other fields are alike. Still, there are traits that are relatively common among students of this subject, and they can make it difficult for computer scientists to come to terms with thinking about e-business.

So, to a rough approximation:

*Computer science is 20 year olds in T-shirts.* Even after they move on from graduation into employment, computer people tend to retain the informality of youth. People involved directly with computer technology are usually young, whether because the work requires a mental agility that fades in later life or simply because the systems themselves are new. But an e-commerce startup requires investors – bankers in suits; and a company-internal e-business initiative needs backing by senior managers – suits again. And any business ultimately survives by serving consumers (either directly, in the case of a retailer, or via value chains down which its own output is ultimately transformed into consumer goods or services); consumers come in all ages, so on average they are middle-aged. The tastes and outlooks of people much older than themselves loom larger in connection with e-business than they do elsewhere in a computing undergraduate's studies.

*Computer science is 'You've been doing the same things for ever, but now our computers are going to change everything!'* Computers have caused what is probably the biggest single change in working methods of the past 100 years, but this can lead computing people to imagine that IT is the *only* important thing to have happened. Grant Norris and colleagues (2000: 119) commented:
Some of these developments, such as enterprise resource planning (ERP; see Chapter 8) are themselves IT-based, but others, for instance just-in-time (JIT) manufacturing, have little or nothing to do with computers. (Manufacturing businesses traditionally held large inventories of products so that they could fill orders that arrived unpredictably, but inventory represents capital tied up unproductively. The trend towards JIT has involved developing methods for predicting demand so that goods can be manufactured as needed and not before.) Part of learning about e-business is learning to allot IT its proper place, important but not overwhelmingly dominant, within the wider scheme of things.

_In computer science, technology is king._ Computing students study many topics, but it is tacitly understood that the techie stuff is what really counts. The students most admired by their peers are the technical gurus. E-business uses technology, but the technical details are not what matters. To quote Grant Norris _et al._ (2000: 137) again, they describe the first ‘large truth’ about e-business thus: ‘E-business is about strategy; it is not about technology.’

Charlie Feld and Donna Stoddard (2004), discussing how business can get the best out of IT, put it this way: ‘Making IT work has little to do with technology itself.’ This point cannot be emphasised enough. The interesting, difficult issues in e-business are how to move businesses forward with the help of the new technology. Somebody needs to know the technical details, but most people involved with e-business, most of the time, can take those details as read – they will rarely be what decides the success or failure of an e-business initiative.

E-business is business that happens to use IT. It is not a branch of IT that happens to be applied to business.

_Computer science is statements such as ‘Arrays in C start at zero rather than one’ – truths that must be learned and accepted, with no room for debate or doubt. Business is the opposite; like war, business is guesswork in a fog. Running a business is a matter of trying out best guesses about how to manage available resources so as to squeeze out most value from them in an unpredictable environment. The guesses often prove wrong._
If people could know for sure the consequences of alternative managerial decisions, the activity we call ‘business’ would scarcely exist. All society would need would be a static administrative activity to oversee the fixed processes by which consumers would be optimally served. In real life, business is what the economist Joseph Schumpeter ([1943] 1976: 83) famously called a ‘process of Creative Destruction’. Existing organisations and ways of doing things are for ever being swept aside through the discovery of more efficient methods, or things that are more worth doing. Bankruptcies are an especially dramatic case, but on a less dramatic scale this happens constantly as processes are reorganised within companies that continue to survive.

To quote the most highly respected management guru of the twentieth century, Peter Drucker ([1992] 1998: 114):

Society, community, and family are all conserving institutions... [A business on the other hand] must be organized for the systematic abandonment of whatever is established, customary, familiar, and comfortable ....

IT has its analogue. Anyone who spends many years in the computing world gets used to painfully learned mastery of particular programming languages, operating systems and so forth being made obsolete by newer replacements. But within any one technical system, all questions typically have cut and dried answers. This can make it frustrating for computing students to read discussions of e-business that say things like ‘arguably, x’ or ‘many people think y’. It can seem as though the writer has not done their job properly: ‘Don’t tell us what might be so; tell us what is so.’ When discussing business, that is often impossible. A writer who pretended that things were more certain than they are would be not a good teacher but a poor one.

AMBIGUITY, SECRECY AND UNPREDICTABILITY

It is not even as though everybody wants to identify the facts clearly. In academic life, to a rough approximation everybody does want that – the motto of many universities is *patet omnibus veritas*, ‘truth lies open to all’. In business, people are trying to sell things, and when the things are as complicated as enterprise software systems, plenty of people have a motive for cultivating vagueness. A new buzzword or phrase comes along and is attached to a range of loosely defined ideas, some of which appear to offer the tantalising prospect of revolutionary advances. Provided the definition is loose enough, a vendor can stretch the buzzword to cover a new software product that serves a narrower, non-revolutionary function, and customers may be attracted via the woolly link with the broader prospect.
To a student, this kind of thing is infuriating. But it is how the real world is, and the student of e-business has to accept that.

Another problem about studying any aspect of business is that many facts in business life are secret. For present purposes, though, that problem is less severe than it might seem. The City and Wall Street contain numerous analysts – business experts who make their living by compiling data and predictions about company activities and performance; part of an analyst’s job is to draw inferences about areas that companies might prefer not to discuss. At the level of an introductory textbook, commercial confidentiality is not really a problem.

Understanding where we are now is one thing; predicting where we shall be going next is another matter. It would be natural for computing students to imagine that although they do not know what is going to happen in e-business in a few years’ time, business experts do know. That is not the case.

What the business experts have, and computing students typically do not have, is a framework of concepts that they can use as tools to make sense of what is going on, as the future unrolls into the present. Instead of seeing the business world as just a blooming, buzzing confusion, someone knowledgeable about business can pin categories on phenomena and make generalisations, and this may allow educated guesses about the way things will go next. It is that conceptual framework that this book aims to offer to the reader.

**USER-CENTRED VERSUS SUPPLIER-DRIVEN**

If the study of e-business has this alien and, for some computing students, perhaps uncongenial quality, why would they want to study it?

One answer is that this topic may be very different from core computing subjects, but it is actually rather interesting. The most persuasive answer, though, may be that computing students need to study e-business if they want to be employable.

For most of the half-century that IT has played an economic role, that role was supplier-driven. Managers had little detailed understanding of what the technology could do for them but sensed that the potential was large, so the technologists could develop hardware and software with reasonable confidence that, if they marketed it, they would find customers: ‘Build it and they will come.’ The default job for a computing graduate was one in which he or she deployed mainly technical skills.

Since the turn of the century, jobs like that have been melting away – although this development is new enough that even computing teachers have not always noticed it.

One reason is that, where purely techie jobs do still exist, often they have moved offshore, to Eastern Europe or to India. It is not that IT work as a whole is leaching away overseas – far from it. At present the UK is running a
multi-billion surplus in IT services trade with the rest of the world (i.e. they are buying far more from us than we are from them). But the career paths available in Britain increasingly involve much more than mere coding.

A second reason is that the rise of the software-as-a-service and web services models of enterprise computing (to be examined in Chapters 6 and 12) means that the economy nowadays has less total demand for code development and maintenance than before.

But the most important reason is that 50-odd years of improvements in hardware and algorithms have led to a situation where computer power is now more than sufficient for most practical applications. What business needs now is people who can think about how to bring the technology to bear on real problems – not people who only want to think about the technology itself. Quoting Bruce Harreld, IBM’s senior vice-president of strategy:

> As applications have become more sophisticated, there is a greater need now to know how to apply the technology to retain competitive edge. It used to be 80 per cent about technology; now it’s 80 per cent about the quality of how it is used.  

Senior managers have ceased to be people who are so baffled by the new technology that they can only give techies their head and hope for the best. By now, they have acquired the savvy and confidence to apply normal management disciplines to IT along with other company operations. Discussing a case study of Delta Air Lines, Feld and Stoddard (2004) comment:

> In doing the hot, sweaty work of simplifying its systems and aligning IT with the company’s overarching business goals, Delta’s senior managers also learned to trust their instincts. They learned that the same business skills that allowed them to see what was wrong with the company’s fleet of aircraft could also guide them in managing Delta’s armada of technology platforms.

Managers in general have been learning this lesson.

Joseph Langhauser of General Motors spoke for many when he told a conference on the future of computing in 2003 that IT tools had proliferated faster than companies can exploit them: ‘We don’t need any more IT… We need to figure out the business processes we have.’ When Intel released its 64-bit Itanium-2 chip in 2002 and marketed it for business computing, it was nicknamed ‘Itanic’ because people were sceptical that business

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8 Quoted by Brian Glick, ‘The next era of IT will be based upon integration’, *Computing* 26 June 2003.

needed the extra power of 64-bit technology. A survey of UK company IT department heads in 2004 found that their top priority was business integration – getting various software systems to work with one another and to support the company’s business activities coherently – and that the very last thing they were concerned about was keeping abreast of new technical developments.

Twenty years ago, advances in computer technology were driven by business needs. Today, cutting-edge technology is driven by consumer electronics (e.g. ever better multimedia for gamers), but what business is looking for is better ways to apply existing technology to its practical problems.

THE NEED FOR SOFT SKILLS

Over the past few years there has been a chorus of calls from industry for computing students to modify their balance of interests, not abandoning ‘hard’, techie skills but understanding the need to complement them with the ‘soft’ skills needed in management – people skills, communication skills and business understanding. In 2000, only 15 per cent of IT job advertisements mentioned management skills; five years later that figure had risen to 40 per cent. A weighty 2007 report by Microsoft on prospects for British IT (which it sees as bright) finds that:

The balance of soft and hard skills is becoming more critical, with soft skills for IT graduates being of more importance than other [technical] disciplines... The ‘traditional’ Computer Science degree with its emphasis on purely technical skills will not be enough on its own to meet the needs of the IT industry ...

(Microsoft 2007: 49)

Many other sources have been filling in the details. In a survey of British IT managers and directors in May 2005, four out of five said that the most important step for company competitiveness is to equip IT staff with comprehensive business skills. The technology journalist Linda More stresses the need for people skills:

… technology staff are no longer able to hide away in the background – they are expected to be seen and heard. Therefore, the growing requirement is for softer, customer-facing skills along with good communication and presentation abilities.10

Corinne Dauncey, marketing manager of the specialist employment agency Tip Top Job, makes similar points from the job-search perspective:

Not only do IT professionals need knowledge and experience, but it is important that they are articulate and commercially astute. Technology and business skills are going to become as important as each other.\textsuperscript{11}

Part of that astuteness is as straightforward as grasping that professional colleagues expect communications to be expressed in literate English, avoiding jargon. Mark Samuels says:

Take note, then, IT candidates. Your future is likely to involve a subtle mix of technology and business... Understand what business requires and communicate your resolution in English, rather than machine code.\textsuperscript{12}

Many IT employers these days are happy to recruit graduates with non-computing degrees, for the sake of the business and other soft skills where they are often strong – a 2007 survey of British IT managers found that more than half of them do not see computing degrees as essential. So students who have chosen computing as a degree subject surely owe it to themselves to ensure that they can offer at least a modicum of these complementary abilities and knowledge.

\textbf{A PROFESSIONAL BASIS}

One short textbook cannot achieve all of these things. People skills are outside its purview. What this book does aim to do is to provide a basic business foundation – to give the reader coming from a computing background a sense of what business is and how it works, and an awareness of some of the trends, the technical possibilities and the IT systems that are changing business now and that seem likely to matter in the future. It gives readers the vocabulary and the concepts they need to hit the ground running, when they first become players on the e-business stage.

In case readers are daunted by the above analysis of how the IT job market is changing, it is worth pointing out that there is an upside as well as a downside. While computing was a purely technical domain, business (and government) kept IT experts ‘on tap, but not on top’ – they stayed behind the scenes, and their status in their organisations was low.

\textsuperscript{11} Quoted by Linda More (see previous note).
\textsuperscript{12} Mark Samuels, ‘What on earth does it all mean?’, \textit{Computing} 30 June 2005.
Now that they are expected to contribute creatively to business developments, they are beginning to receive the respect due to professionals. Eric Woods of the consultancy Ovum commented about public sector IT in January 2007 that ‘It is getting to the point where the IT profession is taken with the same seriousness as any other in government’\textsuperscript{13} – which could not have been said 10 years ago; comparable developments are occurring in the private sector.

Many graduates might feel that cultivation of a broader skills base is a price worth paying for the possibility of attaining levels of career status that were not available to IT specialists in the past. And it is scarcely a ‘price’. In the long run, wider horizons make for a more fulfilling working life.

\textbf{E-BUSINESS IS BUSINESS}

I said, above, that e-business is business that happens to use IT. Since e-business is business, longstanding principles that apply to other aspects of business apply equally to it.

That axiom went temporarily out of fashion during the dotcom bubble. For a short while people believed that the internet had changed all the rules. The \textit{Wall Street Journal} celebrated New Year’s Day, 2000, with a special edition on the new economy, in which its Washington economics editor Thomas Petzinger announced the abolition of the laws of supply and demand, and the Santa Fe Institute economics professor W. Brian Arthur asserted that earnings were no longer a requirement for a successful company: ‘If everyone thinks you’re doing fine without earnings, why have them?’

Not many weeks later came the crash, and since then it has been hard to grasp how people could have said such things. The only rational justification for investing is expectation of future profit – earnings in excess of expenditure. As Stan Liebowitz puts it:

\begin{quote}
In fact, the internet changes very few of the tried-and-true business strategies. Like other important technological advances, the internet will change many aspects of our lives. But the economic and business rules that worked in previous regimes will largely continue to work in the new regime... It is just our hubris at work when we start to think that our technology can change forces that are not of our conscious creation.

(Liebowitz 2002: 1)
\end{quote}

\textsuperscript{13} Quoted by Sarah Arnott, ‘Commitment crucial for public sector IT’, \textit{Computing} 18 January 2007.
Nitin Nohria et al. (2003) carried out a research project comparing samples of American companies that had been consistently successful over a 10-year period with others (companies that had been unsuccessful throughout the period, and companies that had moved between success and the opposite), in order to identify just which management strategies ‘really work’. It seems an obvious question to ask, but it had never been studied in such detail before. Referring to two major enterprise software genres (which we shall be examining in detail in later chapters), they say:

We learned, for example, that it doesn’t really matter if you implement ERP software or a CRM system: it matters very much, though, that whatever technology you choose to implement you execute it flawlessly.

This might suggest that IT is fairly dispensable from a business point of view: use it if you like, but you can get along well enough without it. However, when the UK Department of Trade and Industry (as it then was) published its annual ‘Value Added Scoreboard’ in July 2006, it found that companies known for IT investment tended to be the ones that produced most output value per pound of input cost. And research published by the Hackett Group (a business advisory firm) in 2006 found a strong tendency for companies that are ‘world class’ in other respects also to have world-class IT departments.

Taking the various findings together, the most judicious conclusion seems to be that, yes, IT is indeed important to business – but what is really important is running the business well. Running one’s business technology well is just part of that.
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