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## FOREWORD

BY THE PRIME MINISTER



There is no doubt that electronic commerce is going to have a profound effect on business, Government and consumers and on the way people live and work. E-commerce presents enormous challenges. Countries that wholeheartedly embrace e-commerce will benefit from improved national economic performance. Those that do not risk seeing trade ebb away to low cost competitors elsewhere in the world.

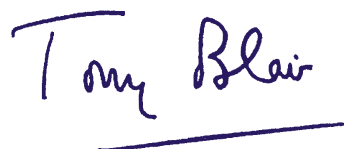
Conscious of the enormous opportunities and threats posed by e-commerce, I asked the Performance and Innovation Unit to prepare a strategy to make the UK the world's best environment for electronic commerce, as announced in last Autumn's Competitiveness White Paper.

The PIU Team has found that the UK is well placed to realise this goal. We have world class telecommunications firms and an open and competitive market. We lead the world in mobile telecommunications technology. We have good levels of Internet penetration in homes and in the workplace. And English is the language of the Web.

But we must not be complacent. There are signs that we are not capitalising on our strengths and keeping up with the pace of change. For example, it is disappointing that a recent survey of Directors in the UK showed that only 2% of UK Board Directors believe that the Internet poses a serious competitive threat. That cannot be right and I hope the messages contained in this report will represent a wake-up call for many in British business.

The Team has identified three areas in which we need to make progress – we need to facilitate access to the technology and networks, we need to enhance understanding of the potential of e-commerce and we need to create an environment where people can have trust in the new medium. There are some things Government can do. For example, we need to ensure that all sections of society have the opportunity to share in the benefits of the e-commerce revolution. We have also got to give a higher political priority to electronic commerce and ensure that all parts of Government are pulling together effectively to improve the UK's performance. That's why I am delighted that Patricia Hewitt will be the Minister responsible for co-ordinating our e-commerce strategy across Government and for taking forward this report.

But it is clear that the Government alone cannot drive forward the development of e-commerce. What is needed is a sustained joint campaign between Government and business to ensure that we reap the benefits. Similarly, Government cannot simply regulate to achieve its aims in this new global electronic environment. This report, therefore, recommends a light regulatory touch. Enough to build confidence in the new way of doing business and to protect consumers, but not so much that we stifle innovation, creativity and entrepreneurship and drive industry overseas. I pledge that we will work with industry to get that balance right.

A handwritten signature in blue ink that reads "Tony Blair".

Tony Blair

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# 1. EXECUTIVE SUMMARY

1.1 Electronic commerce lies at the heart of the Government's vision for building a modern, knowledge-driven, economy in the UK. The Government's aim, set out in the 1998 Competitiveness White Paper, is to "make the UK the best environment in the world for e-commerce". This report provides the culmination of a six-month study by the Cabinet Office's Performance & Innovation Unit. It responds to a commission from the Prime Minister to identify the strategy necessary to achieve that goal.

## KEY MESSAGES

1.2 The report sets out three key priorities for the UK:

- to overcome business inertia - UK business is not yet fully switched on to e-commerce. The best UK companies are world class, but many are lagging behind. Small businesses especially need to wake up to the challenges;
- to ensure that Government's own actions drive the take-up of e-commerce. Sustained progress must be made on electronic service delivery and electronic procurement; and
- to ensure better co-ordination between Government and industry to gain maximum benefit from existing and proposed programmes.

## E-COMMERCE IS IMPORTANT . . .

1.3 E-commerce is of increasing importance to the UK economy. It enables revolutionary change in two ways: 'process' e-commerce -

managing the vital flows of information within industry supply chains - and 'transaction' e-commerce, selling products and services within industry (and Government) or to consumers. It can result in reduced costs and the transformation of Government, companies and markets as well as bringing new opportunities and capabilities to citizens.

1.4 UK e-commerce transactions this year (1999) are expected to be worth around £2.8bn.<sup>1</sup> They have the potential to grow tenfold over the next three years, reaching around 4% of total UK Gross Domestic Product (GDP) by 2002. Their contribution, however, is likely to be disproportionately greater than this relatively small percentage would suggest. E-commerce tends to put downward pressure on inflation and increases economic growth. Figures published by the US Department of Commerce<sup>2</sup> suggest that in the years 1995 to 1998 the Information and Communications Technologies (ICT) industries - key enablers of e-commerce - were responsible for 35% of US real economic growth, whilst representing only 8% of US GDP. In 1996 and 1997, these same industries are believed to have lowered US inflation by 0.7%.

1.5 The overall impact of e-commerce on employment is less clear. It will undoubtedly remove jobs, particularly in intermediary organisations whose perceived 'added value' is undermined. At the same time it will create jobs, in new industries such as 'information brokering' and old industries such as distribution and logistics. If the UK fails to capitalise on the opportunities that e-commerce presents, then jobs and prosperity will be eroded by e-commerce competition from overseas.

<sup>1</sup> Source: IDC research report 1998. Data is only available for part of the e-commerce scope defined in Chapter three. This market figure excludes purely telephone based services such as tele-banking

<sup>2</sup> Source: Emerging Digital Economy II, US Department of Commerce, June 1999

## ... BUT THE UK IS MISSING OUT

1.6 Many good initiatives to promote e-commerce have been launched by Government<sup>3</sup> and industry<sup>4</sup> in recent years. The UK also has key underlying advantages in exploiting e-commerce, including:

- the English language - used on more than 80% of Web sites world-wide;
- a liberalised and competitive telecommunications market;
- a track record for early deployment of new technologies, soon to include interactive television, multi-media mobile communications and pervasive computing; and
- major strength in the broadcasting and content industries.

1.7 Despite all this, the UK lags behind the major economies of USA, Canada and Australia on measures of both business and consumer e-commerce use. In Europe, the UK is also substantially behind the smaller economies of Finland, Sweden and Norway. Germany may well overtake the UK this year

and France, after a slow start, (due to its reluctance to transform its national 'MiniTel' service), is catching up fast.

1.8 The UK's large and medium enterprises (with greater than 100 employees) are holding their own on the world stage in terms of technology deployment, but many have been slow to grasp the opportunities for business change. Small and micro companies are falling badly behind. In Europe, the UK's 'micro' companies are joint bottom of the league table of major economies.<sup>5</sup>

## A 'VISION' FOR E-COMMERCE IN THE UK

1.9 In the race for e-commerce the stakes are high. A powerful and innovative UK, leading in a strong Europe with a genuine 'single market', is essential. E-commerce has the potential to drive a rapid redirection of that single market. This report defines a vision for the characteristics of such UK leadership within Europe. The vision is based around the metaphor of a building with pillars and foundations as shown below in figure 1.1.

### ELEMENTS OF A SUCCESSFUL E-COMMERCE STRATEGY

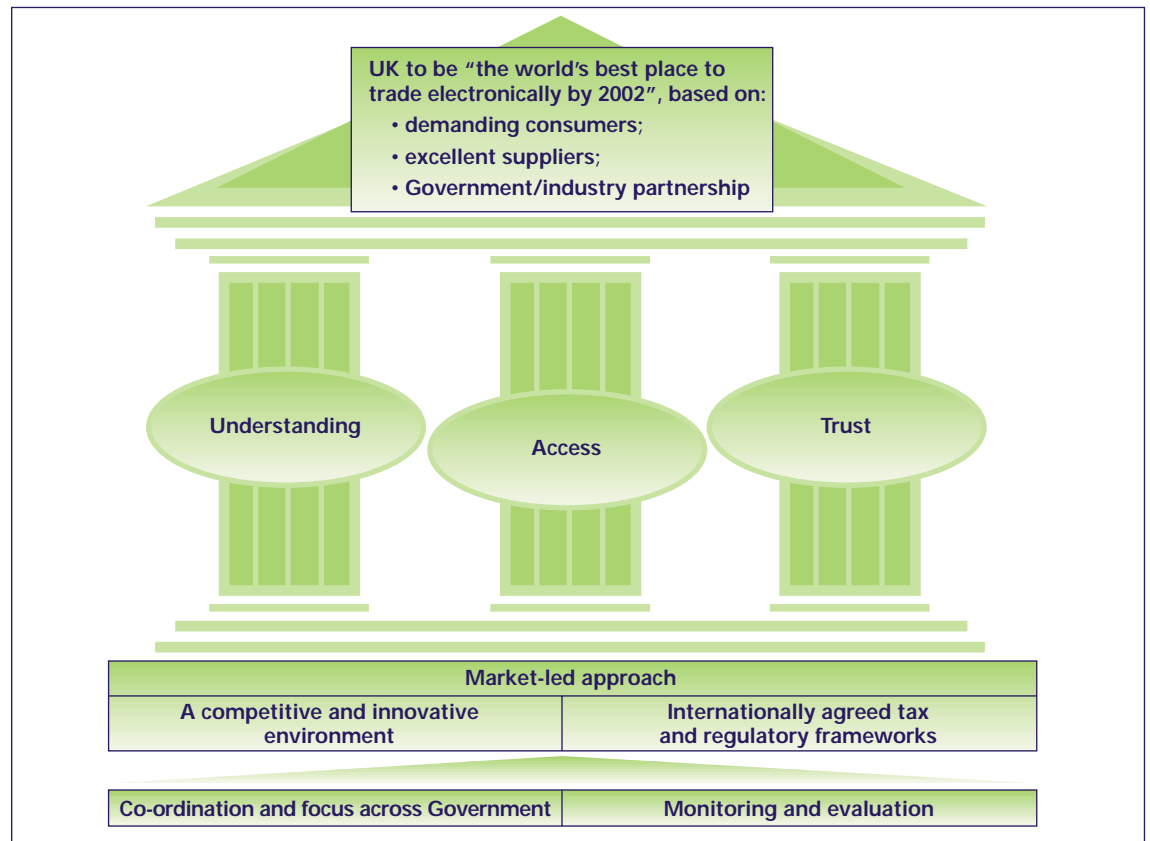


Figure 1.1

<sup>3</sup> For example the Information Age Partnership of Chief Executives established by DTI in 1998

<sup>4</sup> For example the UKCALS Industry Council

<sup>5</sup> DTI Benchmarking study – Moving into the Information Age –1999

1.10 To achieve this vision, the UK must overcome the triple challenges depicted in the 'pillars' of:

- Understanding - getting business, individuals and Government to appreciate in a timely way the opportunities available and the actions to be taken;
- Access - giving businesses, individuals and Government access to all the elements required for full participation in the Information Age; and
- Trust - getting business, individuals and Government to accept the new tools of e-commerce and new styles of doing business.

1.11 As a 'foundation' for this vision, the UK will have reinforced its commitment to open and competitive markets, striking a delicate balance between a necessary degree of 'light touch' regulation and freedom to innovate. It will have demonstrated the power of industry self-regulation - backed by Government. It will have led the successful international resolution of key tax and regulatory issues. It will have put in place the mechanisms to co-ordinate industry and Government actions into a single drive for success and the means to measure and track that success.

1.12 As a result, the UK will have achieved the goal of becoming the best environment in the world for e-commerce. Key indicators of success will be that, by 2002:

For individuals:

- a higher percentage of people in the UK will have access to e-commerce networks from home than in any other G7 country;
- total cost of Internet access will be lower in the UK than in any other G7 country; and
- a higher percentage of the population will use multi-function smartcards than in any other G7 country.

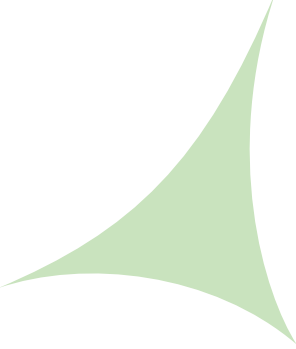
For business: a higher percentage of business-to-business and business-to-consumer transactions will be carried out on e-commerce networks than in any other G7 country.

For Government: a higher percentage of total Government services may be transacted through e-commerce networks than in any other G7 country.

## THE BARRIERS

1.13 This report identifies the key barriers as:

- Foundations: the lack of a clear, internationally agreed, regulatory framework and of clarity in some areas of tax policy. The sheer speed of development of e-commerce, within a competitive and innovative environment that is rapidly changing, has outstripped the normal international processes, despite significant leadership already shown by the UK.
- Understanding: at the heart of the challenge of limited adoption is low understanding of the potential benefits and challenges at all levels. These range from the impact on company profitability to the ability to create entirely new services and forms of market. Many small companies, for whom day-to-day survival is challenge enough, have little time or inclination to address issues that seem complex, technical and irrelevant. Many larger companies appear 'frozen in the headlights' - aware of the likely impact, yet paralysed by the potential for reduced margins and unwilling to address a major transformation of business practice. There are serious skill shortages, both in technical areas and in the management of change in both private and public sectors. Government is not fulfilling its potential vital role as both purchaser and exemplar. Many individuals do not yet appreciate the scope for cost savings and improvements in quality of life possible with e-commerce.
- Access: the challenges of access are multi-layered, just like a Russian doll: when one is solved (and the doll opened) there is a further one inside. The first challenge is access to communications and computing technology. Much has already been achieved: by competition driving down personal computer and software prices; by Oftel's 'Access to Bandwidth' plans to open the BT local access system to competitive use with new technologies; by access centre initiatives from DTI, DfEE, Treasury and DCMS; and through innovative community programmes such as the BBC's 'Web Wise'. However the challenge remains of delivering local telecommunications access competition for new, high quality, high-bandwidth services and of funding successful local access centres in the long term for those who cannot afford, or chose not to have, access from home. The next challenge is access to electronic payment



systems for the more than one million adults without access to conventional banking services. Policy Action Team 14 (PAT14) is addressing this issue as part of the Social Exclusion Unit's work programme. Finally, access for those who through disability or limited literacy will need technological help such as pictogram or voice recognition and guidance interfaces.

- Trust: businesses and consumers must be able to use e-commerce systems without undue fear of fraud and with the same, or a greater, degree of confidence than they associate with physical transactions. There are also barriers related to the privacy of personal and business data. The lifeblood of e-commerce is the ability to use detailed information about individuals' (and companies') purchasing patterns to achieved highly targeted and effective follow up marketing. This immediately raises a potential conflict between personal privacy and existing business practice. A further barrier is that of redress. Simple and appropriate means of dispute resolution need to be established for transactions that span continents. Effective means must be available to avoid unpleasant or offensive content and to limit the potentially expensive nuisance of unsolicited commercial e-mail ('spam').

### WHAT ACTIONS NEED TO BE TAKEN?

1.14 A full list of the PIU team's sixty detailed recommendations is contained in chapter fourteen, and the three key priorities set out in paragraph 1.2 above.

1.15 Many of these recommendations will require industry's action as the prime mover, with Government in support. This summary brigades the recommendations into four groups, as illustrated in figure 1.2:

- those that can be taken quickly and will have an immediate impact;
- those that are also highly important, but will take longer to bring to fruition and are thus longer-term priorities;
- those that can be taken quickly and will maximise the profile of the e-commerce message; and finally

- the necessary longer term, but still important, background actions.

All these are detailed below:

### IMMEDIATE IMPACT

1.16 To have an immediate impact on e-commerce, it is important to galvanise and co-ordinate Government action, to inspire businesses to take up the challenges and opportunities and to get access right.

- Galvanise and co-ordinate Government. There needs to be stronger political and managerial leadership at the centre of Government - driving forward the UK's objectives and co-ordinating actions. This should be achieved through the immediate appointment of an e-Minister and e-envoy. There is great scope for Government to show leadership in e-commerce, both through early introduction in Government's own service delivery, and through Government's purchasing role at the head of a major supply chain. Whilst some early wins are essential for Government's credibility with Industry, much work will need to continue in the longer term.
- Galvanise business. Launching a concerted marketing campaign, in partnership with industry, to generate an e-commerce 'buzz' in the UK is an immediate step which will not only raise awareness of the threats and opportunities for UK business, but also demonstrate the importance the Government places on the role of e-commerce for the future of the UK economy.
- Get access right. This can be achieved, for example, by ensuring that the telecommunications regulatory framework encourages tariff structures which reflect the different usage patterns of e-commerce compared to traditional voice telephony, minimising the cost penalties of 'always on' access and encouraging the development of broadband services. OFTEL has already made vital steps through its 'Access to Bandwidth' proposals, but must be resourced to meet the major challenge of industry's rapid implementation of these changes.

## LONGER -TERM PRIORITIES

1.17 Equally important will be to take action on the longer-term programmes needed to achieve cultural and behavioural changes in understanding and trust.

- For instance, through a concerted effort to achieve recognition of the importance of e-commerce within business (especially within the boardroom), through the use of case studies.
- Mentoring schemes for small businesses, where experience gained is cascaded, with the credibility only achievable among peers who have faced and overcome the same challenges.
- Encouragement should be provided to the private sector for the swift introduction of multi-function smartcards, for use in e-commerce identification and for other purposes. Access to e-cash through such cards would be one option for achieving genuine social inclusion.

## MAXIMISE THE PROFILE

1.18 There are immediate actions that can be taken to maximise the profile of e-commerce in the UK. These include:

- leveraging the UK's balance of the minimum necessary regulation and freedom to innovate through the development of a 'based in the UK' brand (for example TrustUK), linking in to similar initiatives in DCMS and British Trade International;
- providing greater visibility and quick action on on-going measures, such as the Electronic Communications Bill;

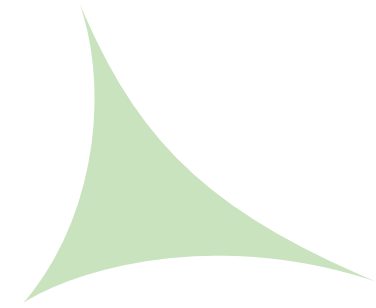
- improving guidance on tax, responding to the relatively poor levels of awareness of the steps already announced; and
- publishing an annual 'state of e-commerce' report, detailing progress in the achievement of the goals and milestones laid out in this report.

## BACKGROUND ACTIONS

1.19 Finally, there are a number of actions that must be set in place in the background. These include:

- examining the new barriers to competition that electronic markets may create and assessing actions which might be taken before serious problems arise;
- driving forward the complex international work on taxation, intellectual property and copyright;
- establishing new targets in schools and across the workforce for IT literacy and promoting awareness of the role of intellectual property in the new knowledge-driven economy; and
- most importantly, setting up mechanisms to measure and monitor the development of e-commerce in the UK.

1.20 Action in all these areas needs to be undertaken as a matter of urgency. E-commerce is remarkable not just for the scale of change it is bringing about, but for the rate of change. If the UK is to win in the race for e-commerce success, Government and business must act now.



PRIORITISATION OF RECOMMENDATIONS

Ease and speed of implementation

Maximise Profile

Immediate Impact

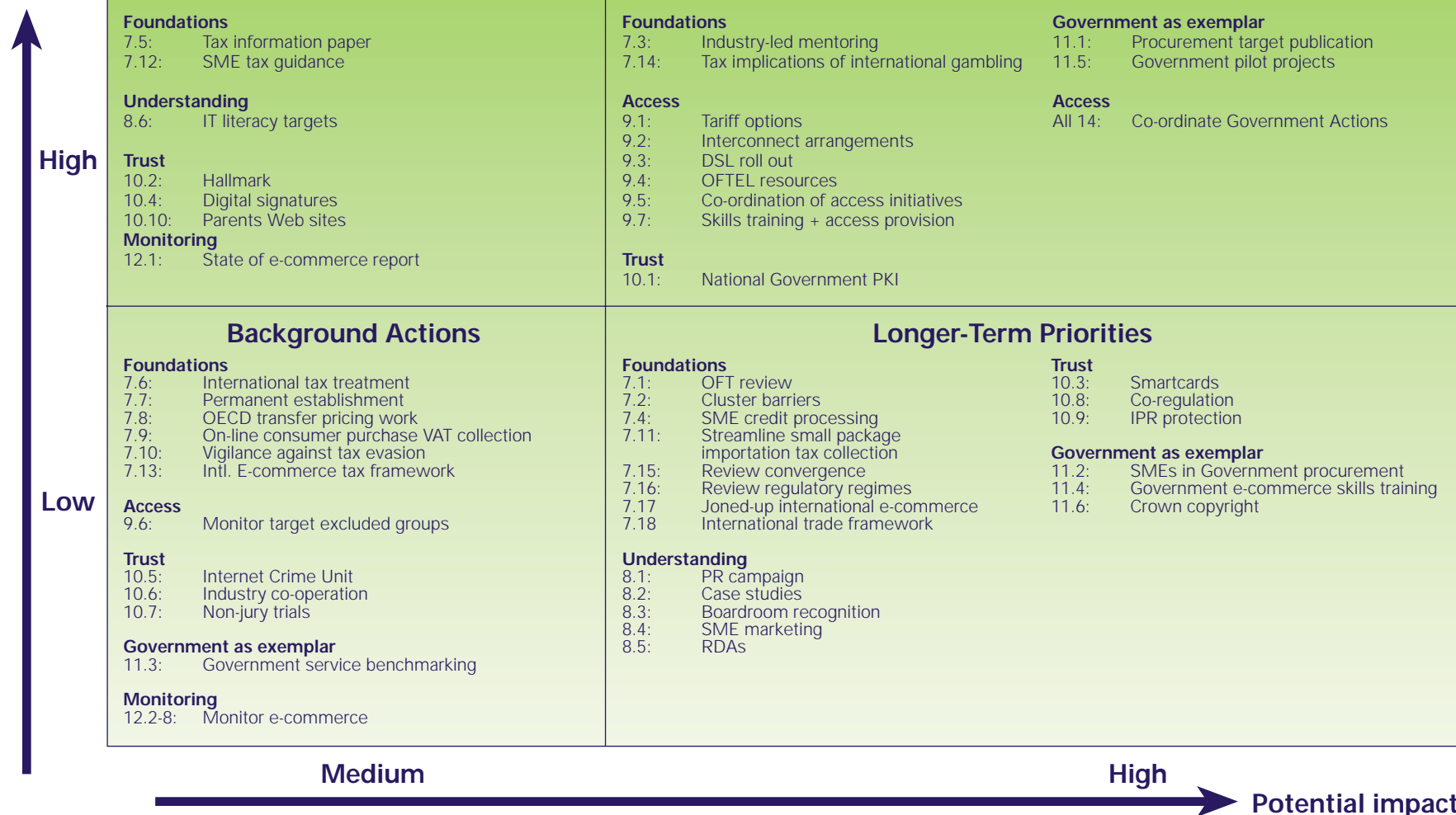


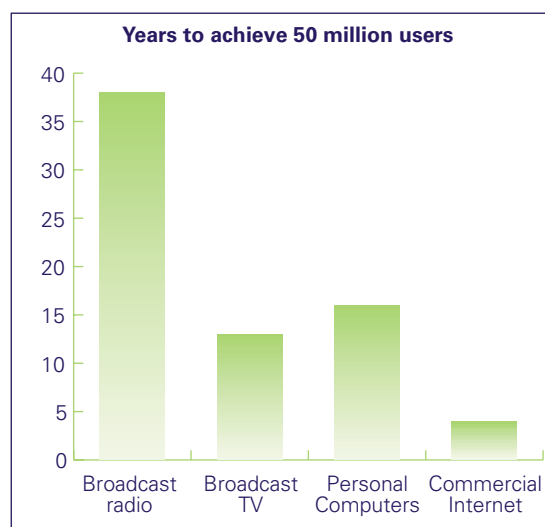
Figure 1.2

## 2. INTRODUCTION

### CONTEXT FOR THE E-COMMERCE PROJECT

2.1 Leading economic commentators, such as Alvin Toffler,<sup>1</sup> have predicted a third 'revolution' – the 'information' revolution – carrying society forward in another major leap equivalent to the earlier agrarian and industrial advances. Economic historians may well look back on the final five years of this century as the defining period in that revolution. The explosive growth of the commercial Internet, beyond its initial base in the military and academic communities, has been unprecedented (see figure 2.1 for US experience). Europe, Japan and the other developed economies are on a similar growth curve of adoption, some one to three years behind the USA. In the US and Canada 102 million people now have access to the Internet and world-wide usage exceeds 179 million<sup>2</sup> (see figure 2.2).

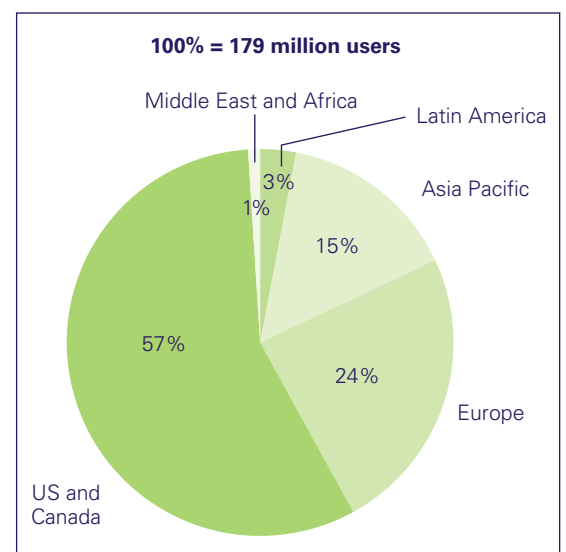
#### UNPRECEDENTED PACE OF CHANGE IN US INTERNET USE



Source: US Dept. of Commerce

Figure 2.1

#### INTERNET ACCESS BY REGION – JULY 1999



Source: NUA

Figure 2.2

2.2 The following two quotations illustrate the scope of the unpredictable change now unleashed:

*"The newest innovations, which we label information technologies, have begun to alter the manner in which we do business and create value, often in ways not readily foreseeable even five years ago"*

Alan Greenspan – Chairman US Federal Reserve Board 6 May 1999

*"The Internet changes everything"*

Bill Gates  
Business @ the Speed of Thought – 1999

<sup>1</sup> The Third Wave – written by Alvin Toffler and published by Bantam Books

<sup>2</sup> NUA Survey July 1999 (see <http://www.nua.ie/surveys>)



## WHY CARRY OUT A STUDY?

2.3 Extensive efforts are already underway both in Government and in industry to prepare the UK to take advantage of this new technological 'revolution', seeking to reap the significant potential economic and social benefits. There remained a concern, however, that the various strands of activity in Government and industry were not necessarily aligned to deliver optimal results. The UK was not assuming a leading position in global e-commerce, even though it was well placed to take such a role. Nor was the UK fully capitalising on its intrinsic strengths in areas such as:

- the dominance of the English language;
- the quality of its liberalised and competitive telecommunications infrastructure;
- world leadership in the deployment of key technologies, such as third generation mobile communications, interactive digital television and pervasive computing; and
- an historic strength in the content and broadcasting sectors.

2.4 At the end of 1998, the Government therefore set itself the ambitious goal of "making the UK the world's best place to trade electronically by 2002";<sup>3</sup> and the Prime Minister directed the Performance and Innovation Unit (PIU) to carry out this study. Its primary purpose is to define the detailed, comprehensive and cross-departmental strategy needed to ensure that the UK achieves this objective. More information on the PIU and its working methods can be found on the Unit's Web-site at [www.cabinet-office.gov.uk/innovation](http://www.cabinet-office.gov.uk/innovation) and in Appendix one.

2.5 By way of overarching structure, the report seeks to address the following broad issues:

- why is e-commerce important;
- what is the UK's current position;
- what does it mean to be the best place in the world for electronic commerce;
- what are the barriers to achievement of the UK's goal; and
- how can these be overcome?

## WHAT THE REPORT DOES NOT DO

2.6 This report does *not* seek to challenge the role of individual Government departments, the devolved administrations, or private sector organisations in delivering e-commerce. The PIU acknowledges the importance of individual departmental programmes that target specific client groups. It also recognises that, in the highly dynamic markets for e-commerce, industry-led initiatives and self-regulatory structures are much to be preferred. The PIU Team has focused its efforts on identifying overlaps or gaps in current activities and on means of ensuring careful co-ordination of these to maximise effectiveness and streamline delivery.

2.7 The devolved administrations have a vital role in delivering e-commerce. The PIU Team was greatly encouraged by the commitment and enthusiasm it found in Edinburgh, Cardiff and Belfast to address this urgent challenge. In preparing its recommendations, the Team has taken the views of officials and businesses in the devolved administrations. Therefore, the Team is confident that its recommendations will be well received where they impact on their responsibilities. A brief overview of activity in the devolved administrations is given in chapter thirteen.

## FINANCIAL IMPLICATIONS OF THE REPORT AS A WHOLE

2.8 The Team believes that for the most part, the recommendations within this report can be implemented within existing budgets. However, it is clear that additional activity will be needed in some areas and this is likely to require a re-prioritisation of resources. It is not possible to estimate the scale of this additional activity with current information. Further, the Team believes that there is considerable scope for public/private partnership. Therefore, further work will be needed to establish full resource implications, in many cases in conjunction with industry. Resource implications will need to be addressed in the normal way.

<sup>3</sup> DTI 1998 White Paper "Our competitive Future: Building the Knowledge-Driven Economy" CM4176

## HOW WAS THE PROJECT CARRIED OUT?

2.9 A multi-disciplinary Team, from both the public and private sectors, was drawn together to carry out the project.<sup>4</sup> Central to the Team's approach was openness and the need to involve industry practitioners in its work. Approaching its task in seven stages, the Team:

- defined a 'vision' for the future of UK e-commerce;
- developed a framework within which to analyse barriers to the achievement of this vision;
- explored and tested this framework in roundtable seminars with key representatives of government, industry, consumer bodies, trade associations and the voluntary sector;<sup>5</sup>
- proposed immediate action to the Chancellor of the Exchequer for his 1999 Budget and to the Secretary of State for Trade & Industry for inclusion in his pending Electronic Communications legislation;
- sought specific regional requirements or differences, through open consultation meetings in Scotland, Wales and Northern Ireland;
- developed preliminary recommendations; and
- produced this detailed final report and recommendations.

2.10 The study has been informed by the Trade and Industry Select Committee's enquiry into e-commerce, which was conducted in parallel with the work of the PIU Team. The Team found evidence submitted to the Committee invaluable, and reviewed its own analysis and recommendations in the light of the Committee's report before finalising this study.

2.11 In producing its recommendations, the PIU Team has been mindful of the Government's existing broader commitments. These include those on public expenditure, the need to refrain from unnecessarily burdensome regulation (particularly for small firms) and the importance of understanding the disproportionate impact policies can have on some sectors of society, including women, ethnic minorities and the elderly.

2.12 More details on the Team and on the approach and methodologies used are contained in Appendix two.

*Note:* Appendices are not attached to the printed version of this report. Copies may be obtained on-line at [www.cabinet-office.gov.uk/innovations](http://www.cabinet-office.gov.uk/innovations). Appendices are included with the CD-ROM version of this report.



<sup>4</sup> See Appendix Two for more details

<sup>5</sup> Detailed reports available on the PIU website <http://www.cabinet-office.gov.uk/Innovation> and in Appendix Three

## 3. THE ECONOMIC IMPORTANCE OF E-COMMERCE

### SUMMARY

3.1 This chapter examines the wide range of definitions of e-commerce. It endorses the approach currently proposed in OECD of a very broad definition. This encompasses the process activities of e-commerce, long-recognised under the label Electronic Data Interchange (EDI), and the more recent developments of transactional e-commerce.

3.2 The chapter moves on to establish the economic importance of e-commerce, outlining its dramatic growth and potential, the major impact it will have on barriers to market entry, its impact on the efficiency and its ability to enable transformation of existing business models.

3.3 The chapter closes by exploring the impact of e-commerce on the macro-economy and argues that the UK needs to move now to capture opportunities, through examination of 'first mover advantage'.

### WHAT IS E-COMMERCE?

3.4 E-commerce is one of the buzz words of the late 1990s, attracting an increasing amount of hype and media attention. But what is it? Most press coverage focuses on Internet shopping, such as the purchase of books from Amazon.com – the world's first Internet book-shop. Such retail e-commerce, involving business-to-consumer purchases, is only the tip of the iceberg. Most e-commerce (some four-fifths) takes place business-to-business. But e-commerce does not just involve financial transactions – it has significant implications for the whole of the business process. In this report we have adopted the broad definition of e-commerce

which the DTI has recommended to the OECD. This seeks to capture the wide impact which e-commerce can have on all aspects of business and society (the definition of e-commerce is elaborated in chapter 12):

*“Electronic commerce is the exchange of information across electronic networks, at any stage in the supply chain, whether within an organisation, between businesses, between businesses and consumers, or between the public and private sectors, whether paid or unpaid”*

3.5 The Team expect the Internet (accessed via the telephone networks) to remain the dominant core network for e-commerce, with interactive digital TV and new mobile services providing different access options. Increasingly, private networks (such as 'Extranets') will provide the improved reliability required for process e-commerce, whilst continuing to use the common core Internet technology.

### WHY IS E-COMMERCE IMPORTANT?

3.6 The PIU Team believes that electronic commerce is important, because of:

- its dramatic growth and potential;
- the major impact it will have on barriers to market entry;
- the way it enables increased efficiency and effectiveness within existing business models; and, most importantly,
- the way it enables transformation of existing business models.

## DRAMATIC GROWTH AND POTENTIAL

### IMPACT ON INTERMEDIARIES

3.7 As already indicated, the speed of adoption of e-commerce is unprecedented. Whilst Electronic Data Interchange between large companies has developed steadily over the last fifteen years, there has been an explosion of growth in retail e-commerce and in transactional use by small business.

3.8 Industry forecasts have consistently underestimated e-commerce growth. In the US, business to business e-commerce is now expected to reach \$1.3T by 2003.<sup>1</sup> Similarly business to consumer e-commerce is thought to have reached \$7bn in 1998 and to be on track to reach between \$40bn and \$80bn by 2002. This suggests that the current pattern, where at least 80% of e-commerce revenues fall in the business-to-business segment, is being maintained. In the UK, e-commerce revenues are expected to reach \$4.5bn for calendar year 1999, rising to \$47bn by 2002.<sup>2</sup>

## MAJOR IMPACT ON BARRIERS TO MARKET ENTRY

3.9 A key aspect of e-commerce is the extent to which it demolishes many existing market barriers. It is vital that UK businesses prepare for the impact e-commerce will have on their markets. These historic barriers can take several different forms. They may be:

- **Geographic.** Box 3.2 illustrates the US/UK differential on portable minidisc player prices, now avoidable by electronic purchasing;

### DIFFERENTIAL ON PORTABLE MINIDISC PLAYER PRICES UK V US

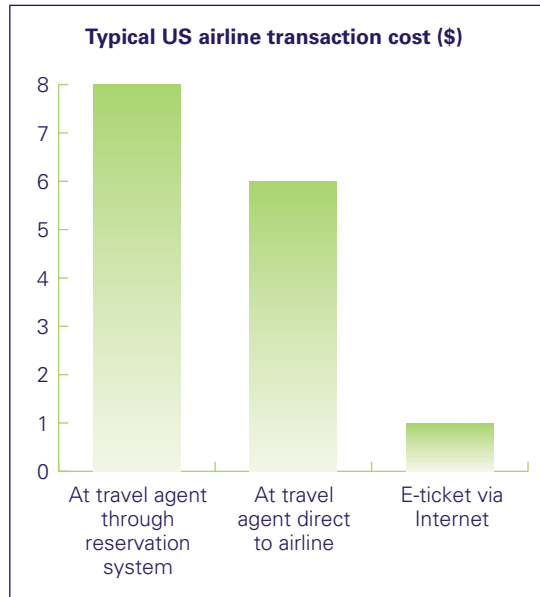
Sony MZ-R55:

- Not yet released in the UK market, currently targeted at the US and Japanese markets only.
- Available for £208 from [www.minidiscnow.com](http://www.minidiscnow.com)
- Expected minimum price when launched in the UK £249.

Box 3.2

Source: the net magazine July 1999

- **Custom and practice.** Figure 3.2 shows the transaction cost saving through avoiding the use of a travel agent;



Source: US Dept. of Commerce

Figure 3.2

- **Market separation.** Box 3.3 illustrates Charles Schwab's entry into the European market; or
- **Business scale.** Figure 3.3 illustrates the potential cost saving on electronic purchase of books, whilst Figure 3.4 documents Amazon.com's revenue growth.

### CHARLES SCHWAB'S PROGRESS FROM US TO EUROPEAN MARKETS

April 1998: Launch of on-line investing services in UK (online trading, portfolio screening, real time prices, market and economic news...).

April 1999: Launch of UK Individual Savings Account (ISA) on the Internet.

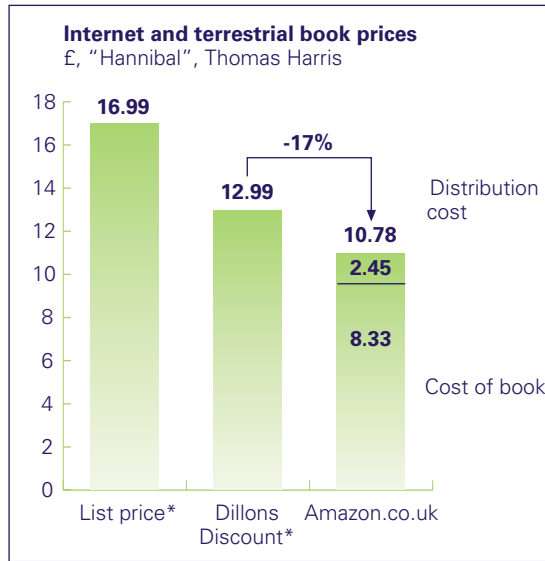
May 1999: Offer US trades via UK web site. Now more than 14,000 registered users.

Box 3.3

<sup>1</sup> Forrester Research Report December 1998

<sup>2</sup> IDC 1998

E-COMMERCE REDUCES PRICES FOR THE CONNECTED CONSUMER



\*Excludes cost to consumer of travel to store

Source: Dillions; Amazon.co.uk

Figure 3.3

INCREASED EFFICIENCY OF EXISTING BUSINESS MODELS

3.10 Electronic commerce is important because of the way in which it is impacting the structure of industries. Its effect tends to proceed in two phases:

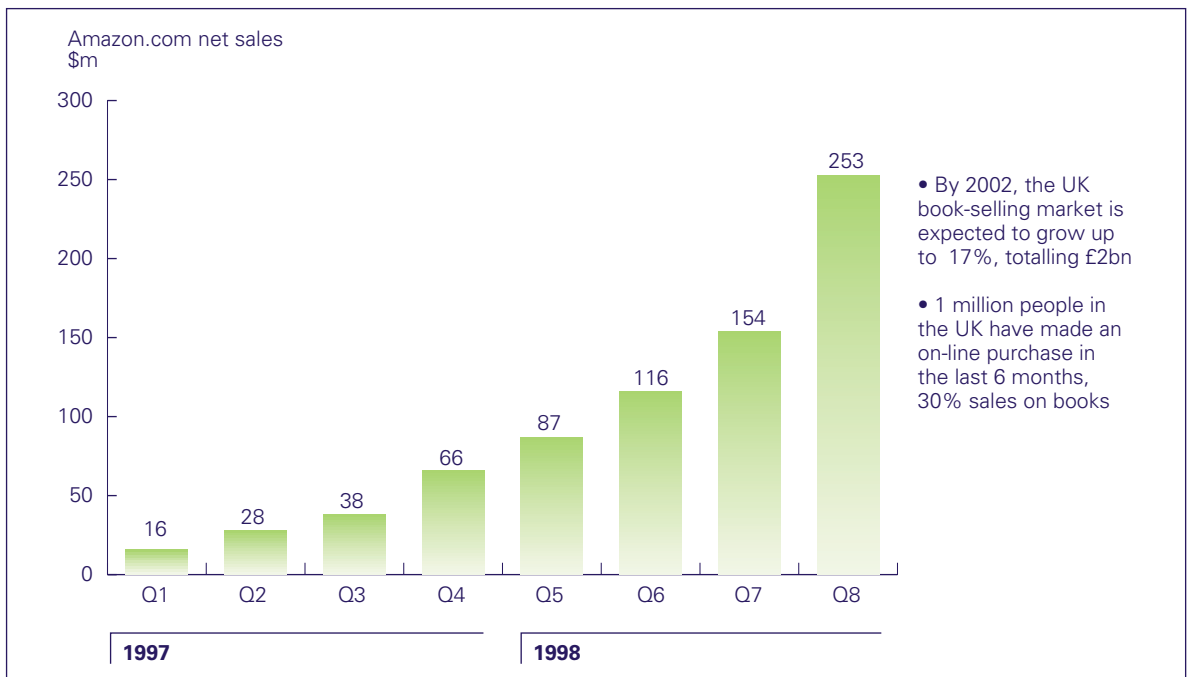
- improving the efficiency of existing structures and supply chains; and in many cases moving on to
- transforming the nature of those industries.

3.11 Examples below (box 3.4), provided by the United Kingdom CALS Industry Council, illustrate the gains already being made by UK industry, in terms of reduced costs and increasing competitiveness within existing business models.

3.12 In the US, the gains are even more dramatic. For example, an Extranet known as ANX, which binds together all the stages of the supply chain in the US automobile industry, should lead to significant productivity improvements, with annual cost savings approaching £1bn for the global industry.

3.13 In the business to consumer area, it is clear that, by embracing e-commerce, industry is also achieving a remarkable "double win". It is both outsourcing work (and thus cost) to its customers and at the same time improving customer satisfaction. Examples have included Cisco, offering on-line customer access to technical design and shipment information databases, improving the productivity of their customer service agents by some 200%.

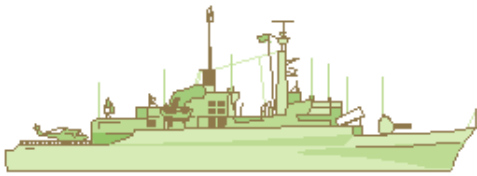
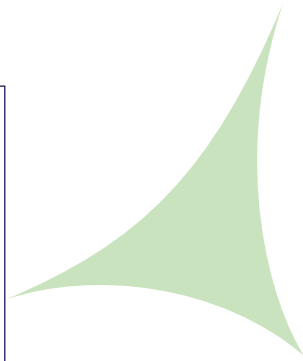
CHANGE IS FAST – EXAMPLE GROWTH IN INTERNET BOOK BUSINESS



Source: Amazon.com

Figure 3.4

- By 2002, the UK book-selling market is expected to grow up to 17%, totalling £2bn
- 1 million people in the UK have made an on-line purchase in the last 6 months, 30% sales on books



**VSEL ... LPD**

Using Electronic Product Definition and maximising concurrency of activities in the Virtual Enterprise.

Compared with similar-sized vessels, LPD had to be achieved in 25% of the man-hours and 50% of the project lead time.



**BOMBARDIER-SHORTS**

Using Electronic Product Definition and shared databases with suppliers.

Delivered 50% reduction in development cycle, 80% reduction in first article re-work and first time fit for wing to fuselage connections.



**ROVER**

Using Electronic Product Definition and links with suppliers through the RED-X programme.

Delivered 6 month reduction in production introduction time and 75% reduction in build problems, mainly attributed to supplier integration through e-business.

Box 3.4

**TRANSFORMATION OF EXISTING BUSINESS MODELS**

3.14 As well as merely improving the efficiency of existing structures, e-commerce enables the transformation of these structures. Some examples of this can already be seen. Wal-Mart, the major US discount chain, is already carrying more than ten times as many product lines on its Web site as in its largest store. In financial services, an estimated hundred-fold cost saving (see figure 3.5) is driving dramatic growth in Internet banking. When taken together with the extensive move to telephone banking, this is already having a major impact on the number high street retail bank branches.

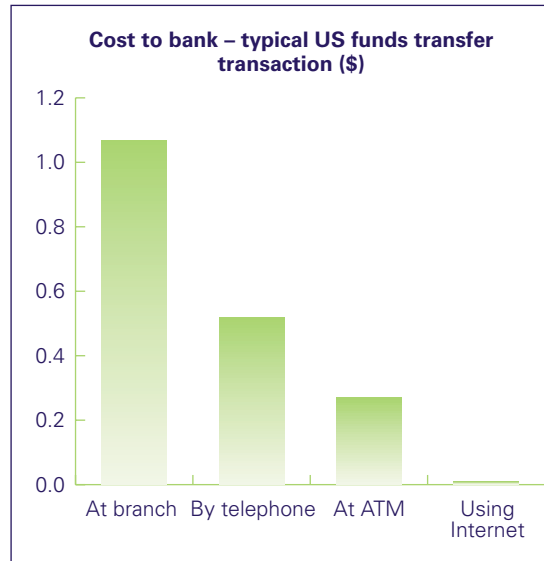
3.15 By lowering traditional entry barriers and ignoring national boundaries, e-commerce also has the potential to enhance sharply the value of strong brands. It seems likely that brands that inspire consumer confidence and trust in one sector will increasingly be leveraged into entirely new sectors. An example is the move by Charles Schwab from on-line share trading to selling insurance on-line.

3.16 It seems likely that such major change may occur in sectors as diverse as:

- **travel** – a reduction in the value, which can be added by conventional travel agents, as passengers increasingly purchase tickets direct from airlines. Easy jet, for example, now sells all its seats over the

telephone or Internet (70% and 30% respectively) – thus avoiding tickets, which are a significant area of cost for conventional airlines;

#### IMPACT ON TRANSACTION COSTS



Source: US Dept. of Commerce

Figure 3.5

- **supermarkets** – as an increasing volume of non-perishable goods are purchased electronically and delivered overnight;
- **entertainment** – as with the advent of much faster Internet access, it is increasingly practical to download films and music directly;
- **financial services** – as the role of existing physical intermediaries is supplanted by network intermediaries; and
- **manufacturing** – with small businesses able to replicate many of the economies of scale previously enjoyed only by large companies, through collaborative purchasing and joint marketing over the Internet.

### THE IMPACT OF E-COMMERCE ON THE MACRO-ECONOMY

3.17 E-commerce is also important because the profound implications it will bring for individual firms will have a knock-on impact on the UK economy as a whole, including on productivity, employment and economic growth. At present we have no comprehensive evidence of the net impact of e-commerce on the economy – and recommendations to gather this are set out in chapter twelve. However, all indications are that its impact could be considerable.

Research in the US, where evidence has been gathered, has shown that ICT industries (for example, producers of computer and communications hardware, software and services), have disproportionately boosted growth and lowered inflation.<sup>3</sup> Whilst accounting for only 8% of US GDP, these contributed 35% of total real economic growth between 1995 and 1998. Similarly, between 1996 and 1997 (the latest years for which data are available), they brought down overall US inflation by 0.7%. These industries are the key facilitators of e-commerce.

3.18 Such figures from the ICT industries alone do not take into account the far wider potential benefits flowing from the use of e-commerce in all sectors of the economy. The extent to which ICTs bring increases in productivity has in the past been the subject of some debate among economists (see chapter twelve). Recently, however, a range of case studies and statistical analyses suggest that investment in ICT, where this is accompanied by appropriate changes in business processes, can bring high rates of return. One analysis, carried out across 17 advanced industrial countries, suggested that an investment of \$1m in IT increased GDP by around an additional \$700,000 a year.<sup>4</sup>

3.19 It is also important to consider the macro-economic implications for the UK of failure to participate in e-commerce. If UK businesses do not successfully embrace the opportunities presented both jobs and prosperity will be eroded by on-line competition from other markets. This was reflected in recent evidence presented to the Trade and Industry Select Committee's enquiry on e-commerce by the Computer and Software Services Association.

*"The US could become the 'out-of-town shopping mall' that bankrupts our high streets..."*

3.20 The PIU Team believe that in principle, e-commerce ought to permit some reduction in inflationary pressures and improve the efficient functioning of the supply side, thus allowing an increase in the trend rate of non-inflationary growth in the economy. There are certainly opportunities for the UK to use e-commerce to help catch up with international best practice productivity performance.

<sup>3</sup> *The Emerging Digital Economy II*, US Department of Commerce, June 1999

<sup>4</sup> Dewan & Kraemer: "International dimensions of the Productivity Paradox" August 1998

3.21 The proposals for a formal evaluation of the overall net impacts of e-commerce put forward in chapter twelve will go some way to establishing the importance of the macro-economic effects discussed here.

companies. The role of Government is to clear the way swiftly for those that wish to move and to raise levels of understanding of the opportunities and threats to e-commerce so that the decision to move or not is an informed one.

## THE UK MUST ACT NOW

3.22 E-commerce is not only of significant economic importance to the UK, but the *rate* of change it brings about is likely to be dramatic. If the UK is to capture the benefits that e-commerce offers and play a leading role in global e-commerce markets, rapid action is required.

3.23 First, the Government needs to act now in order to enable the efficiency gains outlined above to be captured as soon as possible.

3.24 Second, the PIU Team believes that there may be first mover advantages to be gained for UK firms that use e-commerce to enable transformation of their markets ahead of rivals.<sup>5</sup> There are broadly two types of first-mover advantages – cost and demand based. E-commerce has potential elements of both (see box 3.6 below, which uses Amazon as an example). It should also be noted that there can also be first mover disadvantages.<sup>6</sup> When to move is a decision for individual

3.25 This chapter has shown the economic importance of electronic commerce to industry and to the UK's macro economy. It has set out the urgent need to create an enabling environment by removing barriers for business and consumers to capture the benefits described. The following chapters set out how the UK is currently positioned, the nature of the enabling environment needed and how it can be achieved.



### FIRST MOVER ADVANTAGE FOR E-COMMERCE FIRMS

Type	Name	Description	Amazon Example
Cost based	Economies of scale	Costs fall as output increases. First mover has highest output, lowest costs.	Purchasing power
Cost based	Economies of scope	Costs shared across new products. First mover has low costs over large range	Sells CDs as well as books to same customers.
Cost based	Control of scarce input	Competitors do not have access to critical input.	Sites close to wholesalers.
Cost	Learning by doing	Costs fall by being near complementary producers. Early groupings have advantage.	Start near Silicon Valley.
Demand based	Network effects	Additional consumers add value for total customer base. First mover has largest customer base.	More customers mean better affinity marketing.
Demand based	Reputation effects	Uncertain buyers value longevity. By definition first mover is longest lived firm.	Buyers trust Amazon.

Box 3.6

<sup>5</sup> For example, Amazon, Yahoo, E-Bay are all leading e-commerce companies that had no particular advantage when they started other than being first. The Internet took off first in the US and it is US companies that are capturing first mover advantages in many of the new markets e-commerce offers

<sup>6</sup> For example, followers might be able to 'free-ride' on a pioneering firm's investment, and the development of standards might move against those who move first and offer standards to the market

## 4. CURRENT UK POSITION

### SUMMARY

4.1 Whilst the UK has major strengths, the response of industry and Government to the challenge of e-commerce has to date been piecemeal. The UK's best large companies are world class. However, too many seem daunted by the potential of e-commerce to cannibalise their own markets and margins. The aggressive approach of US companies – setting up their own e-commerce subsidiaries to target their core business before competitors do – seems alien to UK practice.

4.2 The e-commerce performance of 'small' and 'micro' UK companies gives rise to particular concern.<sup>1</sup> The UK lags behind other major European economies as well the US Canada and Australia, in this area. Regional disparities in the adoption and diffusion of e-commerce are a further concern. In Northern Ireland, with its small base of large companies, performance is particularly weak, but Wales has also fallen behind. In both cases, Government and development agencies are responding with good programmes to stimulate local innovation and growth, (see chapter thirteen for details).

4.3 UK sectors of historic strength, such as retail financial services, may be especially vulnerable. The 'weightless' nature of these services offers scope for rapid, aggressive, competition from new entrants. These will operate typically on a Europe-wide rather than a national basis. By the same token, exceptional opportunities exist for UK-based companies to extend their operations as the European Single Market in services is progressively created. This chapter details the wide range of actions UK Government is already taking place and benchmarks the UK's current position.

### THE UK GOVERNMENT IS ALREADY TAKING A WIDE RANGE OF ACTIONS TO PROMOTE E-COMMERCE

4.4 Over the last eighteen months, the UK Government has published a series of major policy statements setting out a wide range of policies aimed at helping the growth of electronic commerce. These are summarised in box 4.1.

4.5 This policy agenda has been developed, and in many cases is being implemented, through close partnership with industry. Of central importance are:

- The Information Age Partnership (IAP) Bringing together the Chief Executives of over 35 major IT and communications companies, the IAP is the strategic interface between Government and the e-commerce enabling industries. Established in May 1998, the IAP set up a series of industry task groups to benchmark UK performance and address priority areas. The resulting recommendations to Government in November 1998 have now nearly all been adopted as formal Government policy through the Competitiveness and Modernising Government White Papers and through the last Budget. The IAP has set a continuing work programme, focusing in particular on skills, electronic government, and raising e-commerce awareness in SMEs.
- The Alliance for Electronic Business (AEB), created in 1998, brings together the CBI, the Federation of Electronic Industries, the Computer Software and Services Association, e-Centre UK and the Direct

<sup>1</sup> For the purposes of this report, medium-sized enterprises are defined as those with 100-250 employees, small enterprises as those employing 10-99 staff and micro firms as those employing 0-9 people (in addition to the owner)

## UK E-COMMERCE POLICY: THE STORY SO FAR...

### May 1998: **"Our Information Age"**

Setting out the Prime Minister's personal vision for achieving UK leadership in the Information Age, this included key policies such as:

- connecting all schools, libraries, colleges and universities to the National Grid for Learning by 2002;
- launch of the University for Industry in 2000, using new technology to deliver lifelong learning at home, at work and in the community, with IT skills a key target area;
- 25% of Government services to be available electronically by 2002;
- creation of a national network of "IT for All" access centres in local communities; and
- working with industry, Internet users and law enforcement agencies to provide a self-regulatory response to illegal and harmful content, through the Internet Watch Foundation.

### October 1998: **"Net Benefit: the electronic commerce agenda for the UK"**

Published to influence discussion at a major OECD e-commerce conference in Ottawa, Net Benefit set out the Government's position on all the key e-commerce issues under discussion internationally. In particular, it set out the Government's proposals, following consultation with UK industry, to develop an international taxation framework for e-commerce based around the principles of neutrality, certainty and transparency, effectiveness and efficiency.

### October 1998: **"Electronic Commerce: UK Taxation Policy"**

Setting out the UK's e-commerce taxation policy. Published by Inland Revenue and Customs & Excise on 6 October 1998, as an input to the OECD Ottawa conference.

### December 1998: **"Our Competitive Future: Building the Knowledge Driven Economy"**

The Competitiveness White Paper set the goal of making UK the "best place in world" for e-commerce.

Key policies to help achieve that goal included:

- early legislation to ensure legal equivalence between on-line and off-line ways of doing business, and set a framework to boost development of the market in trust service providers;
- £20 million to expand Information Society Initiative to promote SME uptake of e-commerce technologies
- electronic completion of import and export procedures;
- Improving ICT content and applications (e.g. working with UK's digital content sector to develop an action plan for growth; helping UK businesses secure well over £300 million from EU content and applications programmes);
- an "IPR Action Plan" to modernise the framework of intellectual property rights for an e-commerce environment; and
- 90% of routine Government procurement to be conducted electronically by 2001.

### March 1999: Chancellor of the Exchequer's Budget Statement

The Chancellor presented a National IT Strategy designed to widen access to ICTs in the community, and to encourage small business up take of e-commerce technologies. New policies included:

- the basic ICT understanding currently given by IT for All centres to be taken on a stage through development of 800 more advanced IT Learning Centres, giving community-based access to the National Grid for Learning and the University for Industry;
- subsidised PCs for teachers at home;
- 80% tax breaks for Individual Learning Accounts when used for ICT training;
- recycling computers for 200,000 most deprived families;
- tax changes aimed at encouraging companies to provide home PCs to employees; and
- tax rebate for on-line submission of tax returns by SMEs.

### March 1999: Modernising Government White Paper

- Ambitious new targets for e-government, rising to 100% by 2008.

### July 1999: Modern Markets: Confident Consumers White Paper

New measures to help empower e-commerce consumers, including:

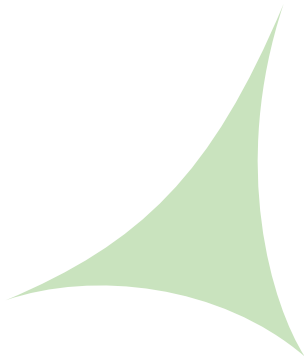
- creation of "Trust UK", an industry-led body aimed at boosting confidence in Internet shopping through an on-line hallmark to identify best-practice web-sites committed to following a demanding code of conduct; and
- creation of a new Consumer Gateway site on the Internet ([www.consumers.gov.uk](http://www.consumers.gov.uk)), providing a one stop shop for public and private sector sources of consumer advice.

### July 1999: Electronic Communications Bill

Government publishes draft legislation to improve trust in electronic trading, including:

- modernising law to recognise electronic signatures;
- removing, wherever practical, existing laws which require the use of paper; and
- a new approvals framework to encourage the development of the market for trust services.

Box 4.1



Marketing Association to promote UK leadership in e-commerce. The AEB principles in its White Paper on e-commerce were influential in shaping Government thinking, for example as set out in "Net Benefit: an e-commerce agenda for the UK", and the AEB has been active in helping Government implement specific new policies.

## MUCH ACTION IS IN HAND INTERNATIONALLY

4.6 E-commerce is global. Many issues – such as developing compatible technical specifications and consumer protection for cross-border transactions – can only be resolved internationally. The UK co-operates with a wide range of organisations, in particular the OECD, the EC and the WTO, to ensure that international agreement reflects specific UK needs and concerns. Box 4.2 summarises current key Government

### ACTIONS BY THE INTERNATIONAL COMMUNITY

#### Consumer protection:

- OECD *Guidelines on Consumer Protection* to be completed by the end of 1999; and
- EU *Electronic Commerce Directive* aims to promote a single market approach to e-commerce consumer protection

#### Illegal and harmful content:

- EU *Internet Action Plan* aims to promote safer use of the internet (hotlines, rating and filtering systems); and
- UK *Internet Watch Foundation (IWF)* involved in establishing an *Internet Content Rating Alliance (ICRA)* dedicated to the development of an objective international rating system for Internet content.

#### Liability of intermediaries:

- EU *Electronic Commerce Directive* aims to clarify the liability of intermediaries for legality of content.

#### Privacy:

- OECD work programme (post Ottawa) includes developing practical guidance on the implementation of the 1980 *OECD Privacy Guidelines* on-line.

#### Copyright:

- Proposed Directive on *Copyright and Related Issues in the Information Society* will cover electronic copies and on-line transmission; and
- WIPO – negotiations underway on protection of databases and establishing an audio-visual protocol to the *WIPO Performances and Phonograms Treaty*.

#### Data Protection:

- *Data Protection Act 1998* gives effect to the *EC Data Protection Directive*.

#### Electronic Signatures:

- *Electronic Signatures Directive*: working to establish recognition and legal admissibility of electronic signatures;
- OECD: *International Conference on Authentication of Electronic Signatures* (June 99) has stimulated further debate in the UK on the need for OECD Principles on Electronic Signatures and Authentication; and
- UNCITRAL working group drawing up *Uniform Rules on Electronic Signatures and Certification Authorities*.

#### Domain Names:

*Internet Corporation for Assigned Names and Numbers* established. UK was a member of the Government Advisory Committee, which met in Berlin 25 May.

#### Taxation:

- Extensive OECD work programme to flesh out Tax Framework document agreed at Ottawa Ministerial. Continuing work with the European Commission to encourage legislative proposals that reflect the conclusions of ECOFIN and the OECD Ottawa Ministerial meeting on VAT as soon as possible.

#### Trade Related Issues:

- WTO preparatory work programme examining multi-lateral trade policy aspects of e-commerce. A report, with appropriate recommendations for further work, will be made to the Seattle Ministerial by end November 1999; and
- WTO Ministerial agreement that customs duties should not be applied to electronic transmissions to be reviewed by the Seattle Ministerial by end November 1999.

#### Research, design and development

- The EU Information Society RD&D programme is worth £3.6 bn, from which the UK is likely to secure over £300m over the next few years to help boost e-commerce technologies, content and services.

Box 4.2

international actions. Major fora, such as the 'Global Business Dialogue', also bring together key industry leaders.

### HOW DOES THE UK STAND ON THE WORLD STAGE?

4.7 As illustrated in figure 4.1, the UK trails the major economies of USA, Canada and Australia on the measure of the percentage of population with regular Internet access. It is also behind the innovative Scandinavian economies of Sweden, Norway and Finland. The chart is drawn from a range of different surveys documented by the Irish Web site 'NUA'.<sup>2</sup> Dates above each entry give the survey date for each country and so the older Finnish, Canadian, Singaporean and French survey data are likely to significantly understate their relative performance. For more specific business measures, such as use of Electronic Data Interchange (EDI) and external e-mail, the pattern is very similar, as shown in figure 4.2. Of particular note here is the strong relative improvement in performance over the last year shown by German and French companies. UK's leadership among the major European economies is clearly under threat.

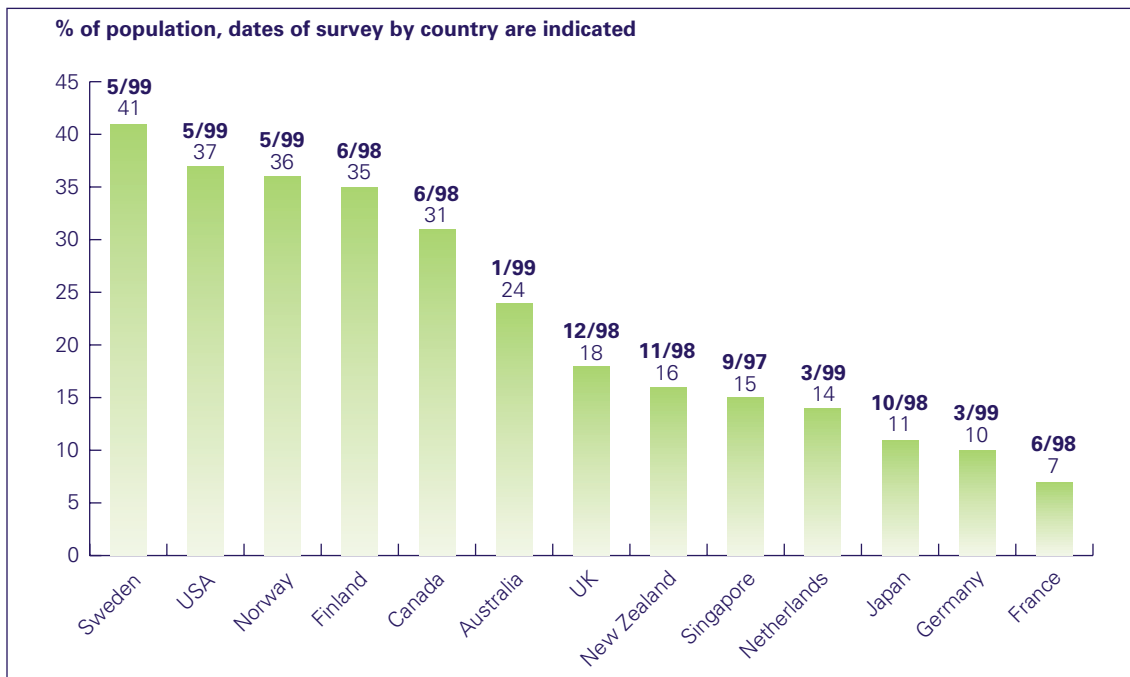
### HOW DOES THE UK COMPARE AGAINST OTHER EUROPEAN ECONOMIES?

4.8 Figure 4.3 gives more detail on UK performance against other European economies for percentage of population regularly accessing the Internet. Again this draws on a range of surveys collected on the NUA web-site. Not all countries have data available for all the dates, but the strength of Finland and the dramatic growth in Ireland in response to a programme of market stimulation are notable.

4.9 Figure 4.4 shows estimates of total e-commerce expenditure as a proportion of GDP in the UK and the other major economies for 1998 and for 2003. It reflects the widely held view among industry experts that the next few years should see the Western European e-commerce market catch up significantly with the US. Figure 4.5 shows that the UK has a high share of that market, reflecting both a relatively high user base and also the fact that those UK Internet users who do buy on-line tend to spend more on average than those of any other European country.



#### BENCHMARKING UK INTERNET USERS – WORLD

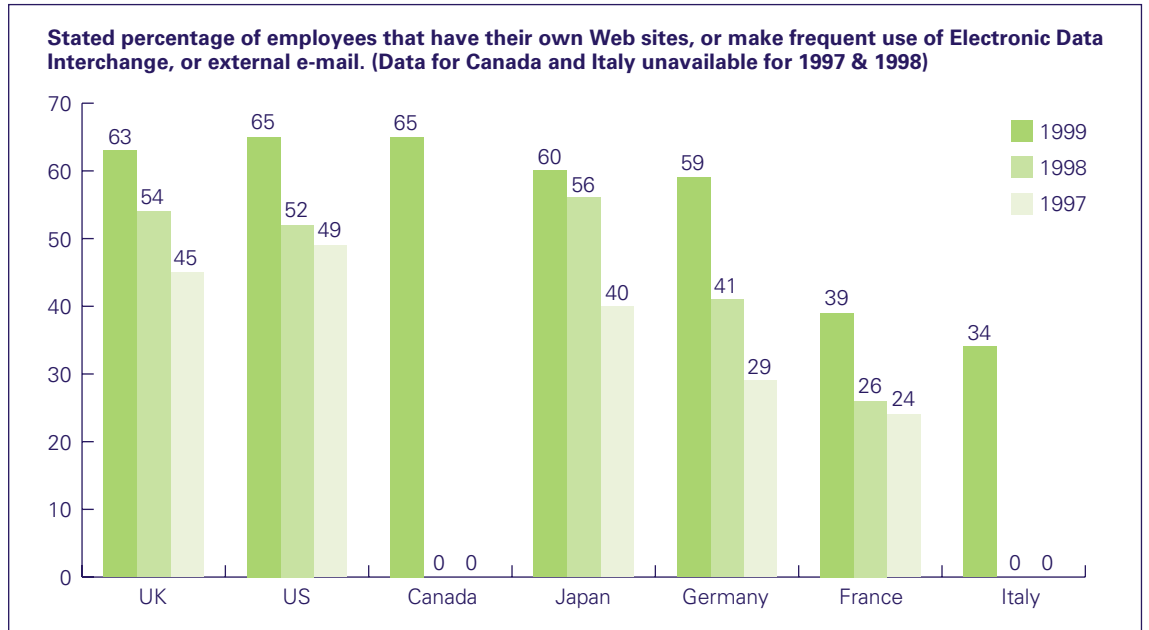


Source: NUA drawing on multiple published studies

Figure 4.1

<sup>2</sup> URL: [www.nua.ie](http://www.nua.ie)

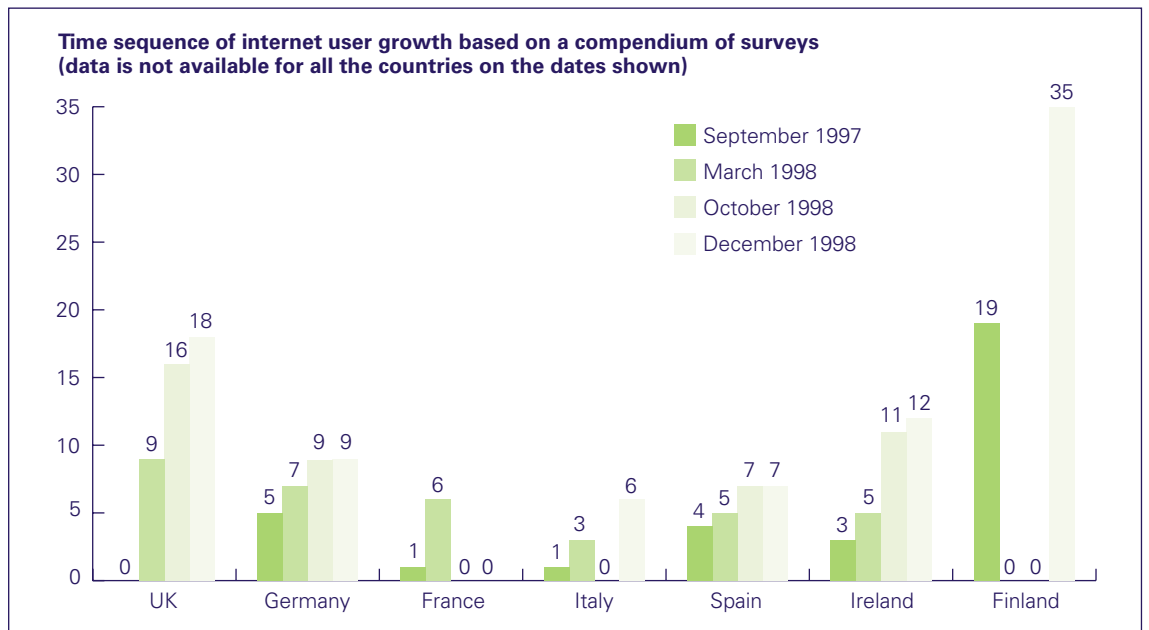
BASIC E-COMMERCE PERFORMANCE – MAJOR ECONOMIES



Source: Spectrum International Benchmarking study – 1999

Figure 4.2

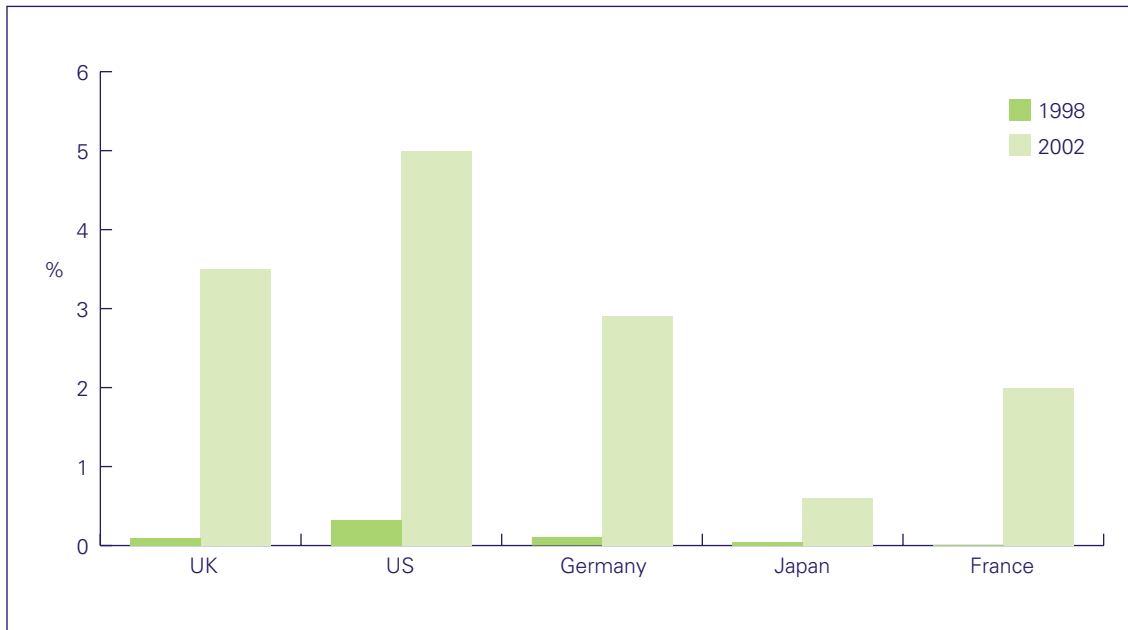
INTERNET USERS BY PERCENTAGE OF POPULATION – EUROPE



Source: NUA – Drawing on a range of other studies

Figure 4.3

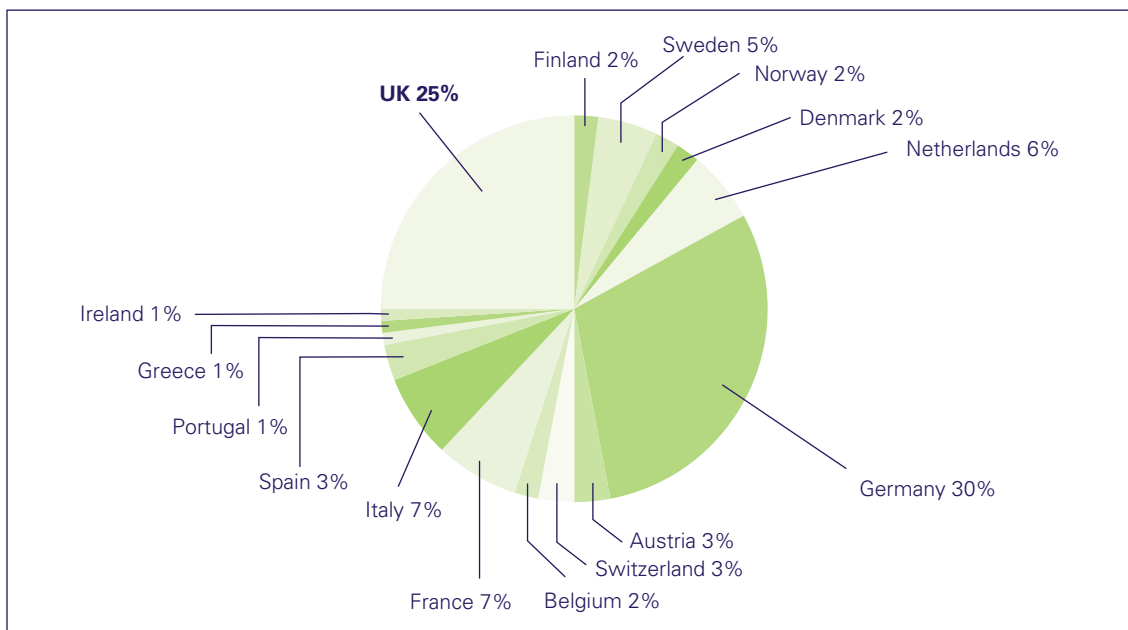
## E-COMMERCE AS A PROPORTION OF 1998 AND PREDICTED 2002 GDP



Source: International Data Corporation, OECD

Figure 4.4

## TOTAL INTERNET COMMERCE BY COUNTRY SHARE OF EUROPE, YEAR END 1998



Source: International Data Corporation

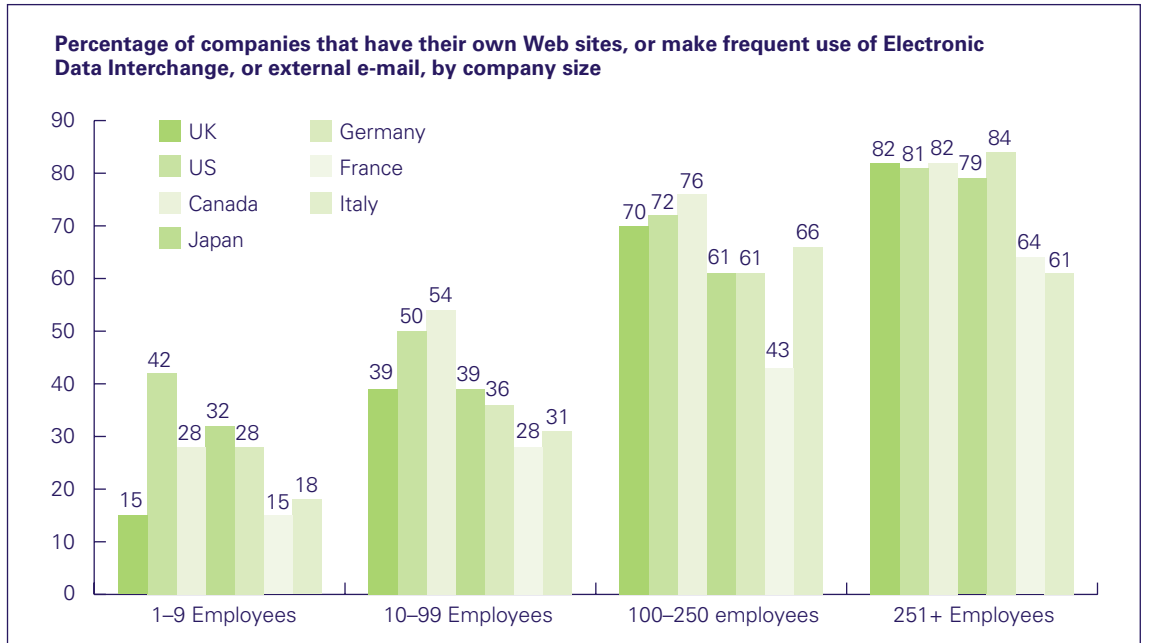
Figure 4.5

### HOW DOES THE UK PERFORM BY COMPANY SIZE?

4.10 The DTI Spectrum benchmarking study provides a helpful insight into e-commerce activity by company size. Figure 4.6 illustrates an extract from this study. UK performance worsens sharply as company size is reduced. Large and medium-sized UK companies are, on average, performing well, but small and

micro firms are lagging behind. Chapter nine explores the particular impact of relatively high, peak time, UK network access charges on such small companies. The relative weakness in small companies is a particular threat as some 70 – 80% of e-commerce revenues are expected to involve such small or micro companies either in business to business or business to consumer roles.

BASIC E-COMMERCE PERFORMANCE BY COMPANY SIZE – MAJOR ECONOMIES



Source: Spectrum International Benchmarking study – 1999

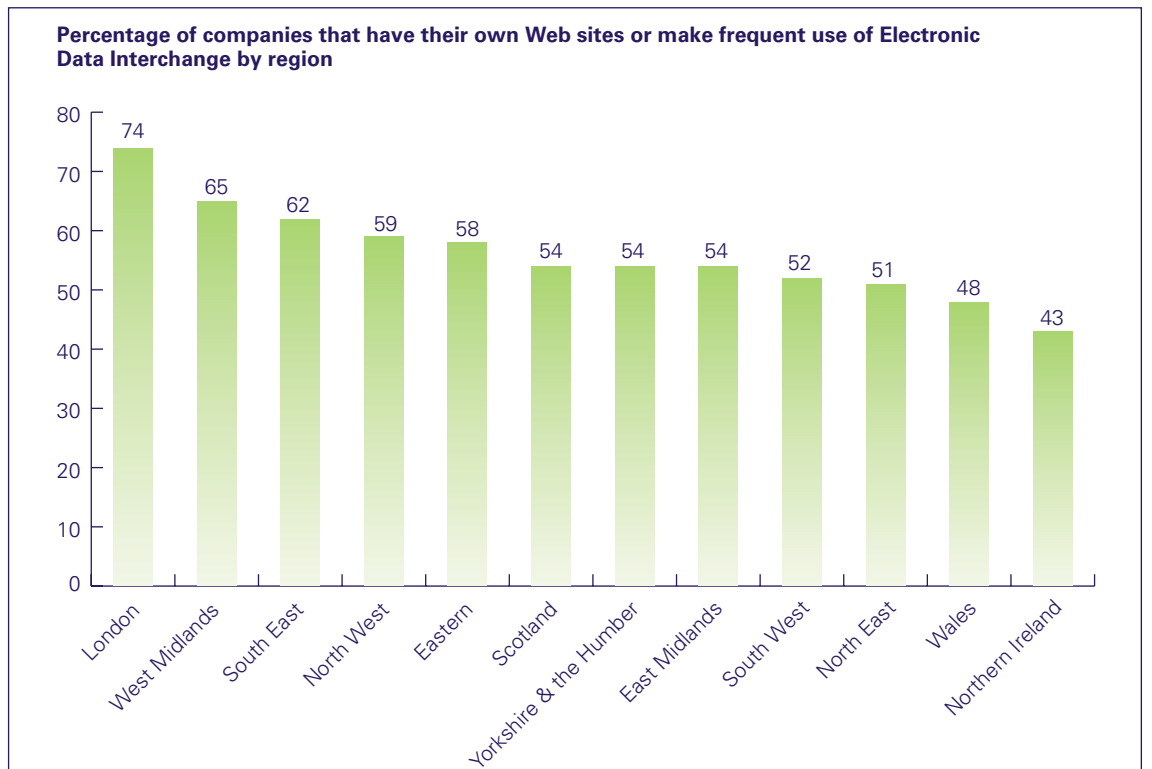
Figure 4.6

**HOW DOES THE UK PERFORM BY REGION?**

4.11 There are significant disparities in the performance of various parts of the UK, as illustrated in figure 4.7. Clearly, there is a risk that some parts of the UK will fall behind in the development of e-commerce, with the potential of further exacerbation of localised

economic problems. The regional development agencies and devolved administrations are already addressing these concerns notably through the 'Strategy 2010' programme in Northern Ireland, the 'Winners at the Web' programme in Scotland and the 'Welsh Information Society' programme. Chapter nine addresses the extent to which large companies pull through e-commerce in

THE UK REGIONS AND DEVOLVED ADMINISTRATIONS



Source: Spectrum International Benchmarking study – 1999

Figure 4.7

their supply and distribution chains, and the relative dearth of such large companies in areas such as Northern Ireland.

4.12 Therefore, although the PIU Team believes that the existing programme of Government action on e-commerce involves a very wide range of Government departments, and represents a significant step towards the Government's goal of developing the UK as the best place in the world for trading electronically by 2002, much more needs to be done. The next chapters will set out a structure for tackling the barriers to e-commerce success in the UK, and give a vision of what success will look like.



## 5. DEFINING A FRAMEWORK FOR UK SUCCESS

### SUMMARY

5.1 This chapter sets out the PIU Team's view that success in e-commerce is a shared enterprise between Government and industry. A consistent message from industry has been that Government should not intervene unnecessarily in developing e-commerce markets. Supporting this view, the chapter sets out the parameters of a role for Government and proposes a new form of co-operative regulation, or 'co-regulation', between Government and industry.

5.2 The chapter then goes on to define the structure that has been used to analyse the barriers to achieving e-commerce success in the UK.

### THE RESPECTIVE ROLES OF GOVERNMENT AND THE MARKET

5.3 The PIU Team strongly believes that much of the action needed to drive forward e-commerce in the UK will rest with industry, backed by Government support. Government and industry both have their part to play, but a market-led approach to e-commerce is essential if innovation, creativity and entrepreneurship are not to be stifled. The role of Government, as illustrated in figure 5.1, should therefore be restricted to:

- **providing a light-touch regulatory and tax framework** within which electronic markets can operate;
- **acting as a catalyst for change**, by tackling market inefficiencies (see Appendix four for further details), but also by working pro-actively to raise awareness of

e-commerce threats and opportunities and to ensure a supply of skilled people;

- **ensuring that e-commerce developments contribute to the creation of a strong and fair society**, by acting to address the equity and social inclusion issues raised by e-commerce, irrespective of the efficiency or otherwise of market processes; and
- **acting as an exemplar** in its own use of e-commerce technologies in service delivery and procurement – both to increase Government's own efficiency and effectiveness and to raise skills and expectations among consumers and businesses.

### CO-REGULATION

5.4 Consistent with the view that even closer co-operation between Government and industry is required, the PIU Team proposes that new co-operative methods of achieving policy objectives will be needed. Therefore, a key theme throughout this report is the approach known as 'co-regulation'.

5.5 Co-regulation recognises that a laissez-faire approach to the Internet by Governments is not tenable in an era of mass-market e-commerce. Consumers need confidence that the transactions they make electronically will be secure, that the goods they order will turn up, and so on. Businesses need to know that on-line transactions will be honoured and need to understand their liability in an on-line world. Originators of content need to know that they will be properly remunerated. To give consumers and business this trust and thus to facilitate the growth of e-business, an underpinning legal and regulatory framework is essential.

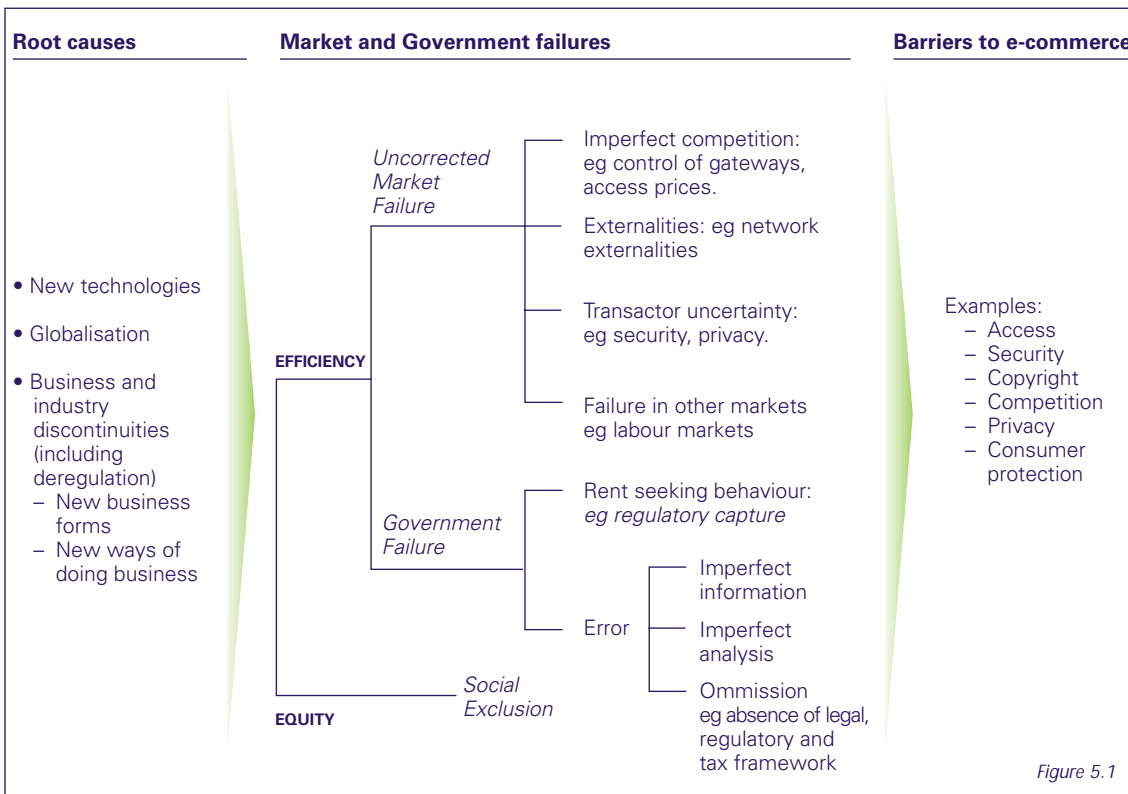


Figure 5.1

However, traditional approaches to regulation are too slow and inflexible to cope with the pace of change in e-commerce markets.

5.6 Co-regulation is a partnership between government and business designed to put in place an overall framework for e-commerce. Government defines the public policy objectives that need to be secured, but tasks industry to design and operate self-regulatory solutions and stands behind industry ready to take statutory action if necessary.

5.7 The advantages of a co-regulatory approach are:

- **flexibility and adaptability.** Voluntary codes and other self-regulatory mechanisms can more easily be adapted to technological changes than statutory regulation;
- **timeliness.** In contrast to the rate of change in the world of e-commerce, Government processes can be very slow. For example, the DTI Bill determining the allocation of radio frequency spectrum – critical to developing new mobile access channels, amongst other things – took 5 years to reach the statute book. EU Directives can take a minimum of 3 years to come into effect. Further, technology specific Government regulations can be

outmoded by the time they are enacted. Self-regulatory regimes can be changed more easily and quickly;

- **appropriateness.** Regarding potential challenges as often profitable new business opportunities, for example requiring new styles of intermediary, rather than as problems for Government to resolve; and
- it will **help create a distinctive “Based in the UK” brand** for UK e-business by giving consumers here and overseas trust in e-businesses based in the UK and enhancing the attractiveness of the UK as a location for e-businesses.

5.8 The main disadvantage of a co-regulatory approach is the risk that self-regulation by existing firms will result in barriers being erected to keep out new competitors. But this can be addressed through the vigilance of the competition authorities.

5.9 Co-regulation has already been adopted by the Government in many areas. For example, the Internet Watch Foundation is a self-regulating response to harmful and illegal content on the Internet. The recently-launched TrustUK initiative<sup>1</sup> is an industry-led on-line consumer protection scheme, which will accredit e-commerce codes of conduct

<sup>1</sup> DTI White Paper ‘Modern Markets: Confident Consumers’ Cm 4410 July 1999

which accord with general principles for codes plus specific principles for e-commerce codes. In addition, the Government is addressing the security concerns raised by e-commerce encryption technology through industry co-operation rather than mandatory "key-escrow".

5.10 However, the Government has not formally adopted this approach as a matter of principle. The Team recommends that the advantages significantly outweigh the potential disadvantages and that a co-regulatory approach should therefore be the first option for addressing regulatory issues concerning e-commerce.

- 'foundations', i.e. the necessary underpinnings for e-commerce, including the general need to provide a competitive and innovative environment for e-commerce, together with a sound underpinning regulatory framework and clarity in all areas of tax policy; and
- supporting 'pillars' of:
  - understanding. The need to create awareness of opportunities and threats posed by e-commerce, overcoming uncertainty and imperfect information about electronic markets, and breaking down skill barriers;
  - access. Giving businesses and individuals the ability to interact, thereby accelerating the achievement of critical mass in electronic markets; and
  - trust. Giving consumers (business and domestic) confidence in electronic markets and ensuring that they are willing exploit the opportunities and react to the threats.

### A STRUCTURE FOR ANALYSING THE BARRIERS TO E-COMMERCE SUCCESS

5.11 In analysing the action needed by Government and Industry, the PIU Team found it helpful to define a structure for approaching the barriers. The structure they identified consists of:

5.12 This report structures the issues around these themes, which the team believes together cover the issues necessary to drive

#### ELEMENTS OF A SUCCESSFUL E-COMMERCE STRATEGY

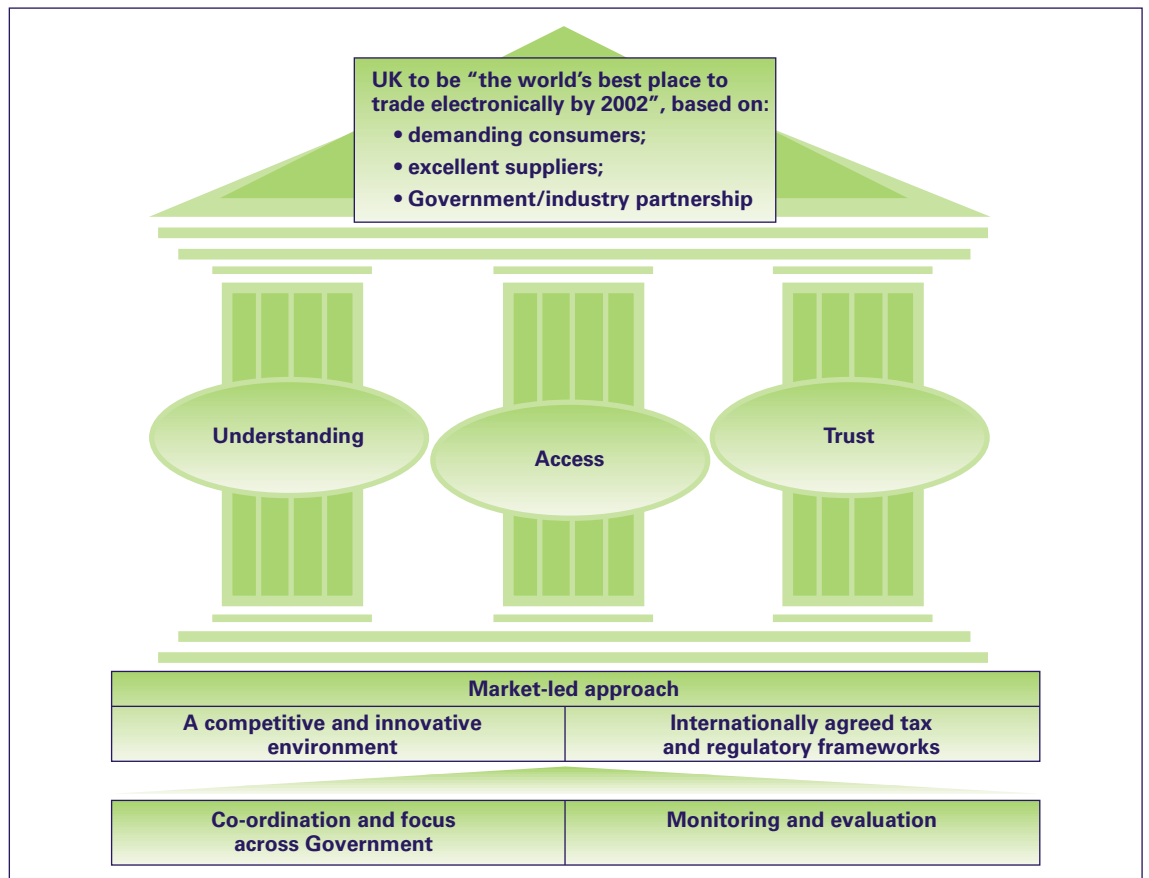


Figure 5.2

EXAMPLE AIMS WITHIN "FOUNDATIONS" AND "PILLARS"

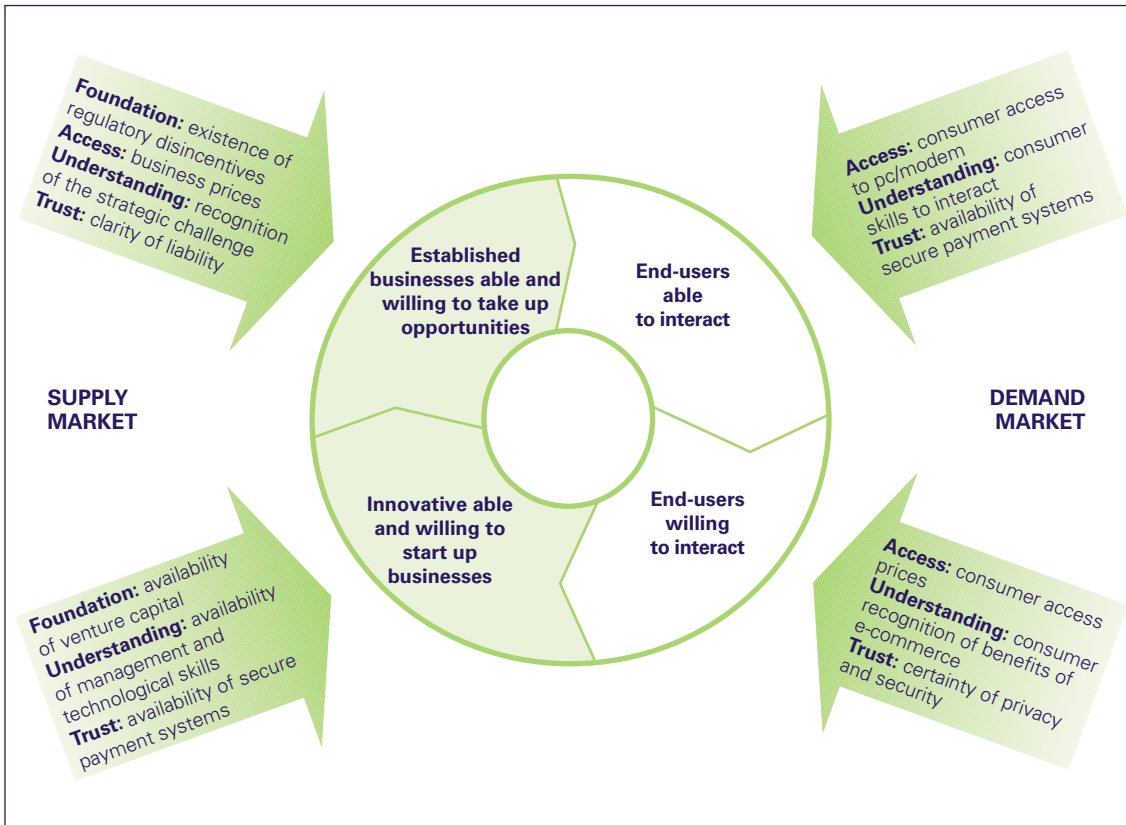


Figure 5.3

the creation of the best environment for e-commerce in the UK (see figure 5.2).

5.13 In broad terms, the foundations can be thought of as the necessary underpinnings for e-commerce. Based on these foundations, the pillar of understanding creates awareness of opportunities and threats, access gives businesses and individuals the ability to interact and trust ensures that they are willing exploit these opportunities and react to threats. However, as described in the following chapters, all of these themes have some relevance to improving ability to interact and promoting willingness as illustrated in figure 5.3.

## 6. VISION

### SUMMARY

6.1 Previous chapters have shown why e-commerce is important, how the UK is currently performing and a structure for identifying the remaining barriers. The Team also felt it was important to articulate what success in e-commerce would look like in the UK. This chapter details such a 'vision'. It is important as it brings the barriers that need to be addressed into sharp relief.

### THE VISION

6.2 The vision is for a country that has put in place the necessary *foundations* of open and competitive markets and stable fiscal and regulatory regimes. A country where business and citizens alike *understand*, in a timely way, the opportunities offered by e-commerce and e-government and the actions to be taken. A country in which *access* is readily available to all the elements required for full participation in the 'Information Age' and where *trust* has been established to facilitate acceptance of new tools of commerce and new styles of operating businesses. The Team envisages the UK as:

- a world class centre for e-commerce; and
- the leading 'hub' for e-commerce activity within a successful single European market, building strategic links with other EU member states.

6.3 This UK leadership will be based on:

- demanding consumers, in a highly competitive domestic market;
- excellent suppliers;
- extensive Government/industry partnership; and

- a recognition of a unique balance between 'light touch' regulation and freedom to innovative expressed through a 'based in the UK' brand, such that:

- Government intervention is only used as a last resort;
- co-regulation is the norm, with a presumption for industry self regulation within a Government backed framework of codes of good practice is the first choice;
- disincentives to the use of electronic commerce no longer exist (good progress is already in train through DTI's Electronic Communications Bill); and
- Government is truly 'joined-up', with close co-ordination of both policy and its delivery.

6.4 Figure 6.1 fleshes out the vision under each of the pillars and the foundations. The following chapters will set out what needs to be done to make a reality of this vision.

6.5 In addition to the detailed monitoring programme set out in chapter twelve, the team recommends the following key indicators as tests of whether, in 2002, the UK has succeeded in its bid to become the best location for electronic commerce:

*For individuals:*

- a higher percentage of people in the UK will have access to e-commerce networks from home than in any other G7 country;
- total cost of e-commerce network access will be lower in the UK than in any other G7 country; and

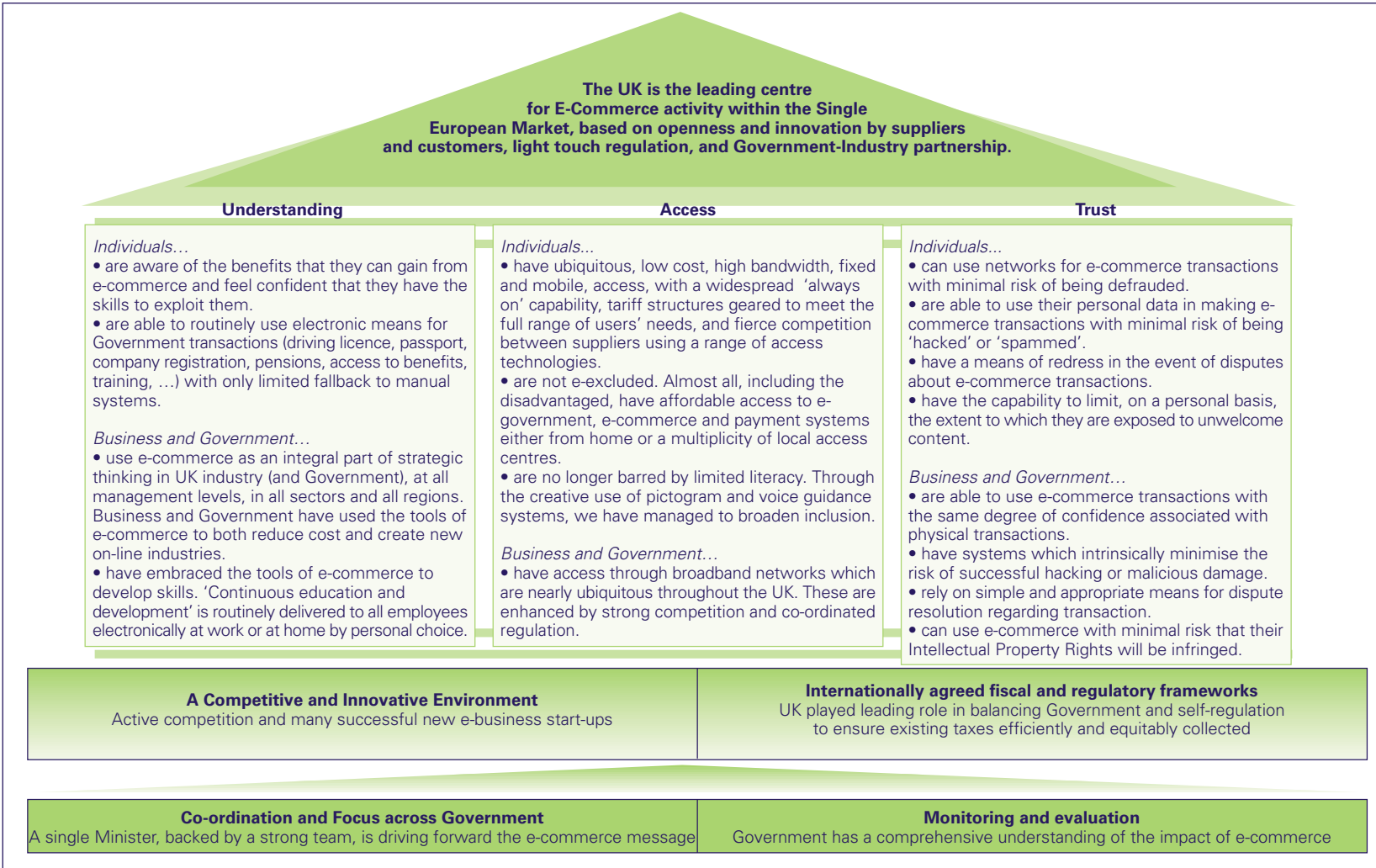


Figure 6.1

• a higher percentage of the population will use multi-function smartcards, incorporating 'E-Cash', than in any other G7 country.

**For business:** a higher percentage of business to business and business to consumer

transactions are carried out on e-commerce networks than in any other G7 country.

**For Government:** a higher percentage of total government services may be transacted through e-commerce networks than in any other G7 country.

## 7. FOUNDATIONS

### SUMMARY

7.1 The previous chapter identified a number of barriers to the UK becoming the best place in the world to trade electronically by 2002. The policy changes needed to overcome these barriers fall into two categories:

- changes that affect the overall framework, or “foundations”, within which e-commerce is undertaken.
- changes specific to particular aspects of e-commerce. These are covered under the headings of understanding, access and trust in later chapters.

7.2 This chapter covers the first of these. Its purpose is to:

- define what is meant by the foundations of e-commerce;
- analyse the main problems that need to be addressed; and
- make recommendations.

7.3 The recommendations put forward fall under three headings: competition and innovation; taxation; and regulation.

### COMPETITION AND INNOVATION:

- Recommendation 7.1: OFTEL and the Office of Fair Trading should carry out a review by end March 2000 to identify any emerging barriers to competition in electronic markets and make recommendations for preventing any such barriers becoming serious problems.

- Recommendation 7.2: DTI should work with industry to map emerging clusters of e-commerce businesses to examine whether their development can be facilitated.
- Recommendation 7.3: DTI should facilitate an industry-led mentoring/partnering initiative to help new Internet service and content businesses start-up and grow.
- Recommendation 7.4: the independent Banking Review, headed by Don Cruickshank, should consider carefully the problems faced by SMEs in obtaining on-line credit-card processing facilities for e-commerce transactions and should recommend action as appropriate.

### TAXATION:

#### OVERALL STRATEGY

- Recommendation 7.5: the Inland Revenue and Customs and Excise should publish a comprehensive Information Paper in the Autumn (1999) updating the Government's strategy for the tax treatment of e-commerce.

#### SAFEGUARDING THE TAX BASE

- Recommendation 7.6: the UK should continue to aim for international agreement on the direct tax treatment of payments for electronic goods and services by end 2000.

- Recommendation 7.7: the UK should continue to seek international agreement on the application of the “permanent establishment” principle to Web sites by March 2000.
- Recommendation 7.8: the UK should continue to play a leading role in OECD work to review the application of transfer pricing rules to e-commerce and to develop rules for attributing income to permanent establishments.
- Recommendation 7.9: the UK should identify effective mechanisms for VAT collection in respect of consumer purchases of on-line items from outside the EU
- Recommendation 7.10: the tax authorities need to remain vigilant in ensuring e-commerce does not lead to increased tax evasion and avoidance.

*SIMPLIFYING AND THEN  
COMMUNICATING THE TAX RULES  
FOR E-COMMERCE TO BUSINESS*

- Recommendation 7.11: the UK should work with the EU, the World Customs Organisation and other international bodies to improve and streamline procedures for the collection of VAT and customs duties on small consignments of imports.
- Recommendation 7.12: the Inland Revenue and Customs and Excise should publish improved guidance for e-businesses, targeted at small and medium sized enterprises, explaining their tax obligations and how the tax system will treat cross-border transactions.

*INTERNATIONAL COHERENCE AND  
AGREEMENT*

- Recommendation 7.13: the UK should continue to play a leading role in the OECD and in other international organisations to achieve an internationally agreed implementation of the framework for the taxation of e-commerce agreed at the 1998 Ottawa Ministerial conference.

- Recommendation 7.14: the UK should seek an international examination of the implications of e-commerce betting and gaming for the tax yield from this sector.

**REGULATION:**

- Recommendation 7.15: the implications of the convergence of telecommunications, broadcasting and information technologies for regulatory regimes and institutions should continue to be kept under review by the DTI and DCMS.
- Recommendation 7.16: regulatory regimes affecting other sectors of the economy need to be reviewed and reformed by the relevant department responsible for each sector to ensure they remain relevant to the changes in industrial and market structure and new business opportunities brought about by e-commerce.
- Recommendation 7.17: the UK should promote a co-ordinated and joined-up approach to e-commerce across Europe and globally.
- Recommendation 7.18: the UK should continue to push for e-commerce to be fully integrated within the framework of international trade.

**BACKGROUND AND  
DEFINITIONS**

7.4 To exploit the opportunities and meet the challenges offered by e-commerce, the UK needs a competitive and innovative environment and to be part of an internationally agreed tax and regulatory environment.

**A COMPETITIVE AND  
INNOVATIVE ENVIRONMENT**

7.5 A competitive and innovative environment is defined in this report as an economic and social environment characterised by:

- a stable macroeconomic framework delivering sustained non-inflationary growth;

- an enterprise culture that encourages entrepreneurship;
- a tax system that rewards enterprise and risk-taking;
- efficient capital markets providing venture capital and other funding for e-businesses;
- a flexible labour force with up-to-date skills; and
- competitive markets that encourage innovation and the adoption of international best practice.

7.6 These requirements are being addressed by the Government's wider economic and industrial policies and go beyond the scope of this report. However, there are a number of issues of particular relevance to e-commerce where the team believes changes are necessary. Consistent with the themes of the Competitiveness White Paper,<sup>1</sup> these fall under the headings of:

- *competition*: early action is needed to identify and tackle any emerging barriers to competition in electronic markets;
- *collaboration*: the need to make sure there are no planning or other barriers to the emergence of clusters of e-commerce businesses; and
- *capabilities*: the need for industry-led mentoring to raise the management skills of start-up Internet businesses and for changes to the employers' national insurance treatment of share options to ensure they don't drive start-up high technology businesses offshore.

## AN INTERNATIONALLY AGREED TAX AND REGULATORY ENVIRONMENT

7.7 E-commerce poses a number of challenges for tax policy and administration:

- *updating the tax regime so it is relevant to a world of electronic as well as physical markets*. In the case of indirect taxes, such as VAT, this means having internationally agreed rules about, for example, the place of taxation of products delivered electronically. In the case of direct taxes, it means having internationally agreed rules defining, for example, the tax jurisdiction in which income or profit has

been earned where the underlying activity consists of services delivered on-line;

- *designing a tax regime for e-commerce that minimises losses of tax revenues* whether because transactions are more difficult to trace, particularly where the good or service is delivered as well as ordered electronically, or because it is difficult to determine the country in which income or profit has been earned and thus to assess which country should get the tax.
- *ensuring tax rules do not act as a barrier to e-commerce and that their application to e-commerce is clear and understood by taxpayers*. The growth of e-commerce not only requires an internationally agreed and enforceable tax regime but a regime that can be readily understood by taxpayers.

7.8 There are three main requirements for addressing the above challenges:

- *a clear set of principles* to underpin the taxation of e-commerce;
- *international agreement* to the implementation of those principles. Without international co-operation and agreement there is a risk of individual countries taking unilateral action which could lead to double taxation or unintentional non-taxation. The resulting compliance costs could damage international trade and UK business in particular. This implies the UK should be playing a leading role in securing international agreement. The key international organisations are the OECD and, for VAT, the EU; and
- *putting in place new arrangements for collecting and enforcing taxes* that keep pace with the change in technology.

7.9 The principles the UK Government is applying to the taxation of e-commerce<sup>2</sup> are shown in box 7.1. These principles are in accord with principles agreed by Ministers from all OECD countries in Ottawa last year.

7.10 Moving from taxation to regulation, chapter five made the case for co-regulation as the over-arching principle for the regulation of e-commerce. In a range of other areas, e-commerce is already subject to the existing body of legislation, such as that on the sale of goods and services, advertising and other consumer law. This contributes to confidence in the market, but action must be

<sup>1</sup> "Our Competitive Future Building the Knowledge Driven Economy", Cm 4176, December 1998

<sup>2</sup> Set out in "Electronic Commerce: UK Taxation Policies", Joint Policy Paper, Inland Revenue and H.M. Customs and Excise, 6th October 1998

## UK PRINCIPLES FOR TAXATION OF E-COMMERCE

- *neutrality* – taxation should seek to be technology neutral so that no particular form of commerce is advantaged or disadvantaged;
- *certainty and transparency* – rules should be clear and simple so that businesses can anticipate, so far as possible, the tax consequences of the transactions they enter into;
- *effectiveness* – tax rules should not result in double taxation or unintentional non-taxation. The overriding aim should be to ensure the right amount of tax is paid at the right time and in the right country;
- *efficiency* – the compliance cost to business and the administration costs to government should be kept to the minimum compatible with effective tax administration; and
- The Government does not believe it is necessary at this stage to make any major changes to existing tax legislation and regulation, or to introduce new taxes.

Box 7.1

taken to ensure that the regulatory framework is up to date and does not place unnecessary barriers in the way of e-commerce. And the regulatory regime for e-commerce also needs to address a number of other issues:

- whether the *convergence of telecommunications, broadcasting and information technologies* requires reform of the regulatory regimes and institutions overseeing the information industries;
- whether the *changes in industrial and market structure* and new business opportunities brought about by e-commerce require new regulatory regimes in other sectors of the economy; and
- whether *changes are needed internationally* as well as nationally.

competition in the economy. However, in some sectors, e-commerce may reduce competitive intensity. For example where:

- a small number of firms achieve dominance over gateways to the Internet; or
- the scale and cost of advertising on key portals and index sites allows some e-businesses to achieve market dominance.

7.12 The “walled garden” is an example of the *potential* new threats to competitive markets that may be created by e-commerce. The walled garden emerged originally as a means of giving consumers confidence that the e-businesses they were dealing with are legitimate and will honour the transactions they make with them. However, as its name implies, a walled garden could allow consumers only to shop within the garden. This is potentially anti-competitive.

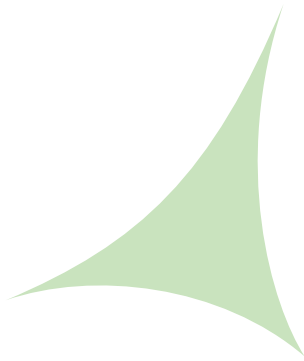
7.13 The issue of walled gardens is likely to become more prominent with the implementation of interactive digital TV in late 1999. This will allow the consumer to access on-line traders and order goods through their television, using a conventional remote control. A potential drawback is, as presently envisaged, that users on some platforms will not be able to access the Internet from their interactive digital TV. More generally, consumers of digital services will often need to gain access to services through some form of electronic gateway – most obviously the set-top box in the case of interactive digital TV. Similarly, service providers wishing to communicate with a customer must often do so through a gateway controlled by another company. “Bottlenecks” could arise where a service

## RECOMMENDATIONS AND ANALYSIS

### RECOMMENDATIONS ON COMPETITION AND INNOVATION

Recommendation 7.1: OFTEL and the Office of Fair Trading should carry out a review by end March 2000 to identify whether there are emerging barriers to competition in electronic markets and make recommendations for preventing any such barriers becoming serious problems.

7.11 It was noted in chapter five that, in general, e-commerce could have significant beneficial effects on the intensity of



provider must use a particular gateway to gain access to certain customers and the use of any alternative route would be uneconomic.

7.14 These problems remain largely hypothetical at this stage. But the DTI and OFTEL will have achieved changes to the Access Control Licence regime, under the Telecommunications Act, by autumn 1999. It is important to ensure that OFTEL has effective tools for dealing with potential anti-competitive practices in this area in any cases where its powers under the Competition Act prove insufficient. They, the Office of Fair Trading, and the Competition Commission, need to be vigilant in tackling quickly any anti-competitive practices that emerge and in promoting new entry competition. A review by OFTEL and the Office of Fair Trading of all possible anti-competitive threats to e-commerce markets are could usefully assist this process.

Recommendation 7.2: DTI should work with industry to map emerging clusters of e-commerce businesses to examine whether their development can be facilitated.

7.15 Successful innovation requires: a flow of commercially valuable ideas from universities and elsewhere; venture capital and other funding to turn ideas into business propositions; and people with the skills to bring them successfully to the market. As noted above, these requirements are being addressed by a range of Government policies.

7.16 However, there are concerns that the formation of clusters of new high-technology businesses, whether in e-commerce or other sectors, may be being held back. The report therefore recommends that DTI should continue to monitor the formation of business clusters, with a view to identifying potential barriers, and should report preliminary findings by the end of 1999.

Recommendation 7.3: DTI should facilitate an industry-led mentoring/partnering initiative to help new Internet service and content businesses start-up and grow.

7.17 A new sector of Internet businesses is growing up around the Web, providing content, on-line market places or value-

added services such as best-buy sites, electronic signature and confidentiality services, electronic payment systems, personal preference brokers etc.

7.18 There is evidence that these businesses are not adequately served by the existing business support infrastructure:

- the banks and the investment community find it difficult to assess risk and conduct due-diligence on new Internet businesses, since the businesses lack a track record and in many cases have a business model which has never been proved elsewhere. In one survey,<sup>3</sup> 28% of digital media businesses cited difficulties in getting access to capital as a key barrier to growth;
- there is considerable anecdotal evidence that the UK lacks the wider support network of accountants, lawyers etc. whose close understanding of Internet business has been a significant factor in helping Silicon Valley start-ups; and
- there is a reluctance, born of an independent, non-establishment culture in these businesses, to approach and use public sector sources of advice and support (e.g. the Business Link).

7.19 Action is already being taken in this area. The independent Banking Review team, established by the Chancellor under the chairmanship of Don Cruickshank, is focusing on, among other things, competition in lending to SMEs. Given the importance of this emerging sector to the wider economy, however, the PIU Team does not believe it right to deal with these problems through generic programmes aimed at high-tech SMEs more generally. It is recommended that the Government should work with industry to develop a self-help network for this sector, perhaps based on the successful model of the Software Business Network (a joint initiative between the CSSA, Computer Software Services Association, and DTI), which already addresses the needs of parts of this sector. The focus should be on promoting business-to-business learning and networking, such as mentoring by successful entrepreneurs, and "marriage brokering" with providers of finance and professional services. Preliminary suggestions should be detailed by the end of 1999.

<sup>3</sup> Informed Sources, 1999

Recommendation 7.4: the independent Banking Review, headed by Don Cruickshank, should consider carefully the problems faced by SMEs in obtaining on-line credit-card processing facilities for e-commerce transactions and should recommend action as appropriate.

7.20 One of the key requirements for a business wishing to develop an e-commerce capability on its Web site is to secure a credit card vendor account so that it can offer its customers on-line credit card processing. However, very few UK banks offer e-commerce services. Those that do frequently require a company to demonstrate up to two years' off-line experience as a credit card vendor before they will give on-line vendor facilities. In effect, this means that new e-commerce businesses in the UK are ignored by the UK banking system.

7.21 This vacuum is currently being filled by off-shore banks, and by intermediary companies which have set up as clearing houses providing software and processing solutions that bridge the gap between the client's bank and the vendor's bank. High charges are levied for these services, and vendors can have to wait up to sixty days for settlement. Anecdotal evidence (through the Team's Seminars and interviews – see Appendices three and six) suggests that the absence of large, trusted UK financial institutions from this market, together with concerns about the cost and potential risk of using small intermediaries, constitutes a significant bar to e-commerce adoption by UK SMEs. However, consumer trust in e-commerce will be damaged if there is a belief that credit or debit cards will be abused by overcharging – either by mistake or by fraudulent misuse. In this context, start-up companies will inevitably find it harder to demonstrate that they are able to receive credit or debit card payments without such abuse.

7.22 There is concern that there is a lack of competition in the market for processing credit and debit cards in the UK, and this is being examined by the Banking Review team (see paragraph 7.19). It is recommended that the review team:

- assesses the extent to which banks' current policies reflect an accurate assessment of

risk – or whether it represents a missed opportunity for the banks; and

- identifies solutions to any genuine barriers that may be preventing banks or others from entering this potentially significant growth market.

## RECOMMENDATIONS ON TAXATION

7.23 The recommendations on taxation in this report fall under the following headings:

- the need for an updated statement of the Government's *overall strategy* towards the taxation of e-commerce;
- the importance of removing tax barriers to the *start-up of new e-businesses* in the UK;
- the need to *safeguard the tax base*; and
- the need to *communicate effectively to small and medium sized businesses* what the tax rules for e-commerce are.

### OVERALL STRATEGY:

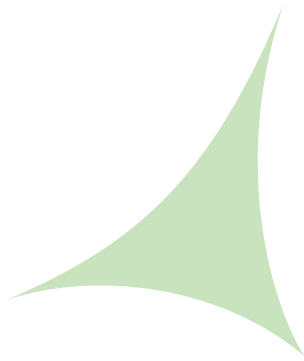
Recommendation 7.5: the Inland Revenue and Customs and Excise should publish a comprehensive Information Paper in the Autumn (1999) updating the Government's strategy for the tax treatment of e-commerce.

7.24 The Inland Revenue and H.M. Customs & Excise issued a joint policy paper last year that set out the Government's strategy for the taxation of e-commerce. There is also ongoing co-operation through the Electronic Commerce Consultation Forum. Considerable further work has been undertaken since last year both nationally and internationally. Therefore, the team recommend that an Information Paper, updating the Government's strategy, should be published in Autumn 1999 – alongside the Pre-Budget Report.

### SAFEGUARDING THE TAX BASE:

7.25 The issue of tax losses has attracted a lot of publicity, mainly as a result of estimates of potential tax losses in the US. One forecaster<sup>4</sup> has projected US tax revenue losses of as much as \$45bn annually by 2003, due mainly to uncollected sales taxes.

<sup>4</sup> Forrester Research Report, December 1998



However, other analysts<sup>5</sup> suggest this exaggerates the extent of the problem in the US because:

- most e-commerce is business-to-business and not subject to sales taxes;
- e-commerce generally involves consumer sales not subject to tax anyway; and
- very few Internet businesses are making profits.

7.26 The problems in the US arise largely from the structure of the sales taxes in individual states. Value Added Tax (VAT) in the UK and EU is structured quite differently and does not therefore face the same risk of a declining revenue yield (see box 7.2)<sup>6</sup> Where the EU does face a problem is in the supply of products digitally to private consumers by suppliers outside the EU. There is currently no way of tracing that these supplies have taken place, nor are there the mechanisms to collect tax in these circumstances. Although this represents a small area of market activity at present, the advent of high-bandwidth technology will mean that this may increase significantly over the next few years. Customs and Excise are working closely with other countries and with business, principally through the OECD, in order to seek solutions to this problem.

#### USA SALES TAXES

USA sales taxes are based at state level and below. Suppliers selling goods to customers resident in a state other than that of the supplier do not have to charge sales tax. The development of the Internet as a tool for ordering and paying for such out-of-state transactions has led to a substantial increase in the tax losses already being suffered as a result of a general increase in mail order sales.

In the EU, VAT is based at the national level and importations from outside EU are assessed for VAT at entry into the member state. For goods supplied to consumers from another EU member state, the VAT is charged by the supplier. The threats to VAT in the EU are therefore much less than the threats to sales tax in the USA.

*Box 7.2*

7.27 However, e-commerce offers the prospect of increased tax revenues as well as threats to the tax yield. This is because, to the extent that e-commerce results in a higher rate of non-inflationary growth in the economy, tax revenues ought to be

stimulated. The Team has five specific recommendations (7.6-7.10) for safeguarding the tax base.

Recommendation 7.6: the UK should continue to aim for international agreement on the direct tax treatment of payments for electronic goods and services by end 2000.

7.28 The UK, like many other countries, requires tax to be withheld from royalty payments made to non-residents in respect of patents or copyrights. The current rules, which distinguish between such payments and payments for goods and services, from which tax does not usually need to be withheld, were developed in relation to physical goods and long predate e-commerce.

7.29 It is increasingly possible for digitised versions of certain products to be transmitted electronically, including e.g. newspapers, magazines, books, photographs, music and software. Consumers may have to pay a fee before being allowed to view the digitised versions; and will usually have to pay a fee before being allowed to download a copy of the product. It is not clear whether a payment to view and download such products is a payment for the use of a copyright or payment for the purchase of a good or service. If the former, practical issues arise concerning whether, under UK law, the consumer should deduct and account for tax when making the payment.

7.30 An OECD working group is currently looking at these issues as part of the two-year programme of work following the Ottawa conference. The UK is seeking an agreed outcome by the end of 2000 which:

- treats electronic and equivalent traditional transactions in the same way for tax purposes;
- avoids double taxation or unintentional non-taxation of income; and
- minimises compliance costs to business and consumers.

Recommendation 7.7: the UK should continue to seek international agreement on the application of the "permanent establishment" principle to Web sites by March 2000

<sup>5</sup> Ernst and Young report: "The sky is not falling", 21 June 1999

<sup>6</sup> Though one recent report, by the Institute of Directors, suggested £10bn of annual VAT revenues in the UK were at risk (Financial Times, 30 August 1999)

7.31 The UK taxes non-residents on their UK income. But, where the UK has a treaty with the person's country of residence, it only exercises its right to tax if the person has a permanent establishment here as defined in the tax treaty. Broadly speaking, "permanent establishment" means a fixed place of business. The application of the permanent establishment concept to e-commerce needs clarifying. In particular, there is uncertainty about whether a Web site on a server is a permanent establishment and, if so, in what circumstances.

7.32 This issue affects both the foreign taxes UK businesses have to pay abroad and the UK taxes foreign businesses have to pay in this country. It is therefore important to resolve both – to secure national tax revenues and provide a clear tax framework within which businesses can operate. And the UK is actively participating in the OECD work on this issue that is due to be completed by March 2000. The UK should continue to seek international agreement on the way forward within this timescale.

Recommendation 7.8: the UK should continue to play a leading role in OECD work to review the application of transfer pricing rules to e-commerce and to develop rules for attributing income to permanent establishments.

7.33 E-commerce is likely to increase the complexity of arrangements relevant to the determination of the appropriate prices for transactions between associated persons in different jurisdictions for direct tax purposes. It could become more difficult to identify where relevant functions have been performed, to quantify the value added in relation to business conducted over the Internet and to establish where any such value has been added. Similar problems arise in relation to the attribution of profits to permanent establishments.

7.34 The UK chairs an OECD working party on transfer pricing and is actively contributing to work being done by the OECD on the attribution of profits to permanent establishments. The OECD is closely monitoring developments in e-commerce to ensure it can move swiftly to update/modify guidance on transfer pricing/attribution rules as and when this becomes appropriate.

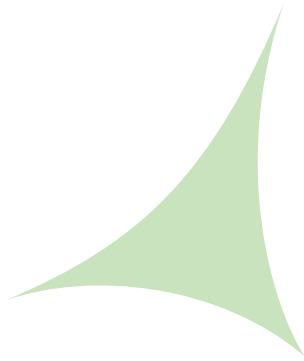
Recommendation 7.9: the UK should identify effective mechanisms for VAT collection in respect of consumer purchases of on-line items from outside the EU.

7.35 Current VAT rules do not provide for collection of tax on digital items purchased by private consumers from outside the EU. Items such as software, CDs and videos downloaded on-line therefore escape VAT. At present it is believed that the volume of such consumption is not great. The goods and services concerned account, in any case, for a relatively small proportion of consumers' expenditure. So the threat to the revenue yield from VAT is not presently large. It is, however, likely to grow, especially when increased bandwidth encourages this model of distribution. Part of the work being carried out in the OECD by the UK and other countries is aimed at resolving this issue.

7.36 The UK has encouraged the European Commission to bring forward legislative proposals to bring the 'place of taxation' rules up to date generally and to bring them into line with the Ottawa conclusions on VAT (see box 7.3). By doing this, European traders would be safeguarded from unfair tax competition such as that which adversely affected European telecoms companies until a similar legislative change was introduced in 1997.

7.37 But even if the legislative gap is filled, there remain important practical questions about how the tax would actually be collected. One option is some form of automated revenue collection which Customs and Excise is exploring with interested parties such as infrastructure providers and software developers. Customs and Excise need to continue to investigate, with EU member states and other countries, as well as business, what would be the most effective mechanisms for VAT collection on on-line purchases from outside the EU by private consumers. It is important that these mechanisms are developed alongside the business models to ensure that they are effective without being burdensome. This is likely to be a process which will extend at least until the end of the OECD's two-year programme of work established at Ottawa.





Principles agreed for consumption taxes (VAT) at OECD Ottawa Conference in October 1998:

- rules for the consumption taxation of cross-border traders should result in taxation in the jurisdiction where consumption takes place;
- for consumption purposes, the supply of digitised products (on line delivery thereof) should not be treated as a supply of goods (in the UK this means treating them as services);
- countries should consider using some self-assessment mechanism where this would give immediate protection of their revenue base and of the competitiveness of domestic suppliers; and
- countries should ensure that appropriate systems are developed in co-operation with the World Customs Organisation and consultation with carriers to collect tax on imported physical goods.

Box 7.3

Recommendation 7.10: the tax authorities need to remain vigilant in ensuring e-commerce does not lead to increased tax evasion and avoidance.

7.38 E-commerce may lead to an increase in non-compliance with the tax regime. In order to minimise the risk to the tax yield, the UK tax authorities are:

- reviewing the adequacy of current powers for information gathering in an electronic environment;
- examining the extent to which existing or developing technologies, standards and protocols can be used or modified to identify taxpayers, trace or establish their location, identify commercial or business transactions and those transactions on which consumption taxes are due;
- examining how developments in technology might be used to trigger a bill for consumption taxes for on-line supplies by a non-resident supplier to private customers;
- monitoring the development of electronic payment systems for any compliance risks they present; and
- working with other groups within OECD to improve the exchange of information between jurisdictions and to improve multilateral assistance with the collection of taxes.

7.39 The UK is playing a leading role in the work of the OECD on these issues, chairing the working group that is looking at them as part of the two-year work programme agreed at Ottawa last year. The group is aiming to make significant progress by the end of 2000.

*SIMPLIFYING AND THEN  
COMMUNICATING THE TAX RULES FOR  
E-COMMERCE TO SMALL BUSINESS:*

Recommendation 7.11: the UK should work with the EU, the World Customs Organisation and other international bodies to improve and streamline procedures for the collection of VAT and customs duties on small consignments of imports.

7.40 The use of the Internet for purchasing goods is leading to a significant increase in the number of small consignments entering the UK from outside the EU. For supplies of physical goods that cross the EU frontier, customs and VAT are due in the country that receives the goods.

7.41 Currently, low value thresholds are allowed by EU legislation. In the UK, a *de minimis* limit of 22ECU (about £18) applies to all physical imports. Where the value for duty of such imported goods is below this figure, customs duty and VAT do not have to be paid. Goods ordered electronically using the Internet but delivered physically thus present no additional risks to the UK's revenue yield. There may however be an increase in the marginal "loss" that results from application of the *de minimis* limits as more small consignment purchases are made from overseas suppliers using the Internet as the ordering and payment mechanism.

7.42 The UK is currently reviewing the thresholds allowed under EU legislation with a view to simplifying the processes. A number of options are under consideration, including raising the threshold, eliminating it, applying a single rate of duty, and maintaining the status quo. Suggestions for consideration by the European Commission and other member states are likely to be brought forward within the next few months.

7.43 It is recommended that the UK should continue to work with the EU and other

international bodies to improve and streamline procedures for the collection of customs duties and VAT on small consignments of imports. Preliminary findings should be reported by the end of March 2000.

Recommendation 7.12: the Inland Revenue and Customs and Excise should publish improved guidance for e-businesses, targeted at small and medium sized enterprises, explaining their tax obligations and how the tax system will treat cross-border transactions.

7.44 E-businesses, particularly small and medium sized businesses, are unclear what the tax rules governing e-commerce are. The tax authorities need to produce clear guidance and publish it on the Web, perhaps on DTI's e-commerce resource centre on the Web. This should be completed by November 1999.

#### *INTERNATIONAL COHERENCE AND AGREEMENT:*

Recommendation 7.13: the UK should continue to play a leading role in the OECD and in other international organisations to achieve an internationally agreed implementation of the framework for the taxation of e-commerce agreed at the 1998 Ottawa Ministerial conference.

7.45 Unilateral action by the tax authorities in the UK or other countries would be likely to result in different countries having different tax rules for e-commerce. Different tax rules in different countries would be a barrier to businesses involved in international trade and would increase their tax compliance costs. And Governments need to keep pace with technological developments to secure their tax base.

7.46 Much has already been achieved internationally. As a result, for example, of the Ministerial-level conference in Ottawa last October, the OECD has a two year programme of work underway on e-commerce tax issues (including royalties, VAT, the definition of "permanent establishments" and transfer pricing, on which specific recommendations are made

below). Similarly, in July last year EU Finance Ministers agreed the following for VAT:

- existing VAT provisions should be adapted to e-commerce on the basis of established international guidelines. There should be no new taxes;
- digitised products supplied by electronic means should be treated, for VAT purposes, as supplies of services (which means that unlike physically supplied items such as books, CDs etc. they are not subject to customs duty); and
- the place of taxation of services supplied by electronic means should be the place of consumption.

7.47 The UK has been a driving force in the OECD and EU on the tax issues raised by e-commerce. It is vital that the UK not only plays a leading role in the OECD, which is the best forum for agreement on these issues, but also in other international organisations – so progress continues to be made towards an internationally agreed framework for the taxation of e-commerce.

Recommendation 7.14: the UK should seek international examination of the implications of e-commerce betting and gaming for the tax yield from this sector.

7.48 E-commerce has the potential to facilitate the growth of Internet and telephone-based betting and gaming, so threatening the tax revenues raised in the UK from this sector. For example, "virtual casinos" on the Internet currently escape UK duties when not established here. This illustrates the need for international agreement in the OECD.

7.49 There is currently no international framework for the taxation of betting and gaming. The UK is therefore seeking an international review of the implications of Internet and telephone-based betting and gaming for the tax revenues raised from the sector. This should be initiated in the OECD by December 1999.



## RECOMMENDATIONS ON REGULATION

7.50 E-commerce raises fundamental questions about the regulatory regime in three key areas:

- the regulation of information age industries (telecommunications, broadcasting and information technology);
- the regulation of other sectors of the economy e.g. financial services; and
- the need for internationally agreed regulatory frameworks.

### INFORMATION AGE INDUSTRIES

Recommendation 7.15: the implications of the convergence of telecommunications, broadcasting and information technologies for regulatory regimes and institutions should continue to be kept under review by the DTI and DCMS.

7.51 The convergence of telecommunications, broadcasting and information technologies poses a significant regulatory challenge. It means consumers will eventually have the choice of accessing a full range of digital entertainment and other services over a wide range of networks and through a variety of different consumer electronic devices. They will soon, for example, be able to access the Internet over their TV set and may eventually watch TV programmes delivered over the Internet.

7.52 However, telecommunications and broadcasting are currently subject to different regulatory regimes under the auspices of different regulators: OFTEL in the case of telecommunications; the ITC and the BBC in the case of broadcasting. As technologies converge the case for a single regulator will become increasingly strong.

7.53 The Government's view, set out in its June 1999 statement<sup>7</sup> is that an evolutionary approach to regulation, based on improved co-operation between the regulators and a number of specific initiatives in particular areas, is the right way forward. This approach was originally proposed in a 1998 Green Paper,<sup>8</sup> and received support in the subsequent public consultation.

7.54 There is no merit in moving regulatory responsibilities around between different bodies for the sake of doing so – what matters is the substance of regulation and effective co-ordination between the regulators. The Team is satisfied that the measures set out in *Regulating Communications: the Way Ahead* are satisfactory for the time being, but DTI and DCMS will need to continue to keep the development of markets under close review to ensure that this remains the case.

### OTHER SECTORS OF THE ECONOMY

Recommendation 7.16: regulatory regimes affecting other sectors of the economy need to be reviewed and reformed by the relevant department responsible for each sector to ensure they remain relevant to the changes in industrial and market structure and new business opportunities brought about by e-commerce.

7.55 Changes in industrial and market structure, as a consequence of e-commerce, may undermine current regulatory regimes throughout the economy and may even be a barrier to the growth of e-commerce in some sectors. A good example of how this might be avoided is the Financial Services and Markets Bill currently before Parliament. This provides for a more modern approach to the regulation of financial promotions such as advertisements for shares or financial products. In a consultation document published in Spring 1999, the Treasury proposed that secondary legislation should be used to cut back the Bill's basic prohibition on unauthorised persons making financial promotions. The consultation document proposed that the basic prohibition should not apply to promotions appearing on overseas Web sites which are not "directed at" the UK. And, whilst this approach should lend much greater industry certainty than the current legislation provides for, it should equally allow sufficient flexibility for the regime to keep pace with developing technology and international regulatory practice. The Treasury consultation document also set out ideas for making the scope of the FSA's regulations technology-free – recognising that the development of e-commerce has made the old distinction between, for example, passive advertisements and active letters, out-of-date.

<sup>7</sup> *Regulating Communications: The Way Ahead*

<sup>8</sup> "Regulating Communications Approaching Convergence in the Information Age" (Cm 4022)

7.56 It is recommended that preliminary assessments are completed by June 2000 as part of the more general sectoral impact assessments, detailed within recommendation 8.2.

#### INTERNATIONAL AGREEMENT

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7.57 In a number of areas, particularly for instance in the field of consumer protection, UK legislation stems from EU Directives. Regulatory regimes need therefore to be reviewed and reformed at the international as well as domestic level to ensure they take account of the breakdown of geographical barriers brought about by changing technology. It is important to be aware that no supplier is likely to be able to meet 15 different sets of consumer, health and safety or other requirements when exporting throughout the EU. The EU e-commerce directive only tackles this issue in relation to certain requirements. In other areas further harmonisation of EU legislation is required. For this reason, the UK, together with the European Commission and Parliament, favours 'high level' harmonisation under the draft directive for distance marketing of financial services. Unfortunately, most other EU member states are opposed.

Recommendation 7.17: the UK should promote a co-ordinated and joined-up approach to e-commerce across Europe and globally.

7.58 In order for the UK to take full advantage of the opportunities afforded by e-commerce, co-operation is required on an international basis, in particular within the European Union. It is imperative to ensure that regulation in the rest of the world is of high quality and that the UK is in step with it. Failure to do this will lead to market failures (chapter five). The UK must ensure that it plays a full part in EU regulatory development, and that the EU legal framework encourages rather than discourages the development of e-commerce. In a Council Resolution on the Information Society last year, the member states invited the European Commission to review the existing consumer legislation in the light of e-commerce developments. This work must be given priority.

7.59 A number of EU initiatives deal specifically with the Internet e.g. the draft

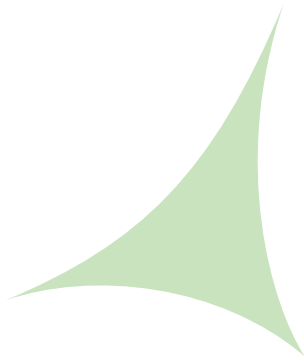
E-Commerce and Copyright Directives, and the Action Plan on safer use of the Internet. In addition, a large number of horizontal initiatives also bear significantly on e-commerce, including the Transparency Directive, the Distance Selling Directive, the draft Directive on the distance marketing of financial services and the Data Protection Directive. The Distance Selling Directive includes provisions to protect consumers from unsolicited commercial communications, including e-mail or "spam" (see chapter ten). It allows member states to adopt either an "opt-in" or an "opt-out" approach. As well as providing the effective protection the Directive requires, the Government will need to ensure that its approach does not act as a disincentive to e-commerce development.

7.60 The UK should take a leading role on e-commerce in Europe and should promote full and effective co-ordination within the European Commission. The UK should work to ensure that EU initiatives are compatible with co-regulatory principles and, in those areas where it is possible, carry through implementation at an early stage rather than waiting for a complete package to be agreed.

7.61 The UK should push forward EU work to address the problems and uncertainties which are likely to grow as cross-border transactions increase. The draft E-Commerce Directive usefully proposes that traders should be governed by the regulatory requirements of the member state in which they are based, so that suppliers do not have to comply with fifteen different sets of rules. The Team welcomes the recent appointment of a new Commissioner for Enterprise and the Information Society and recommends that the new co-ordinating team in the UK should work closely with the Commissioner to push forward a EU-wide e-commerce strategy.

7.62 Nevertheless, the workings of international law will remain complex. Cross-border enforcement will be a challenge both for regulatory bodies and for businesses and consumers who find themselves in contractual disputes. The field of private law disputes between litigants is subject in Europe to governing conventions (the Brussels, Lugano and Rome Conventions). The draft E-Commerce Directive does not seek to go into this field of law, but proposes that information should be made available about the contractual rights and obligations





of suppliers and their customers. This must be a priority. As we note in chapter ten, concern about obtaining redress is a key issue to be overcome in building trust in e-commerce.

Recommendation 7.17: the UK should continue to push for e-commerce to be fully integrated within the framework of international trade.

7.63 Internationally, the UK should continue to press for e-commerce to be fully integrated within the framework of multilateral trade policy as it has been developed over the last fifty years. In particular the rules of the World Trade Organisation (WTO), which support this framework, need to be developed further to maximise the benefits e-commerce has to offer.

7.64 The next WTO trade-round starting in Seattle in November 1999 will be an important opportunity to secure international agreement on e-commerce strategy. Priorities should be:

- maintenance of the present multilateral moratorium giving customs duty-free treatment;
- full endorsement of the principle of technological neutrality between e-commerce and traditional commerce;
- agreement on the applicability of the General Agreement of Trade in Services (GATS) rules to on-line delivered products;
- further liberalisation of services beyond that already set out under GATS and further liberalisation of government procurement;
- capacity building for developing countries, through appropriate financial, technical and knowledge-building assistance to help them build, develop and exploit their e-commerce capability; and
- proper and balanced protection of intellectual property rights so as to stimulate innovation, application and exploitation; and ensuring interoperability and interconnectivity.

## 8. UNDERSTANDING

### SUMMARY

8.1 It is critical that UK industry and Government should develop a greater understanding of the opportunities and threats resulting from e-commerce in order to achieve the Vision set out in chapter six.

8.2 This chapter argues that e-commerce has created new challenges for our understanding and also for our associated skills and goes on to detail solutions to address these. Recommendations fall into two main categories – promoting understanding and building skills:

- Recommendations to promote understanding:
  - Reach the whole market:  
Recommendation 8.1: mount a concerted PR campaign in partnership with industry to create an e-commerce “buzz” in the UK. Commission research to identify the most appropriate branding to support this campaign.
  - Ensure shared understanding with industry sectors:  
Recommendation 8.2: carry out and communicate shared industry/Government sector-specific “e-commerce impact assessments” to highlight the opportunities, threats and barriers in each sector, and in particular in the audiovisual content industry.
  - Seek to influence particular business groups:  
Recommendation 8.3: work with key business influencers to

increase boardroom recognition of the strategic challenges of e-commerce;

Recommendation 8.4: develop a multi-channel marketing strategy to influence small, medium and micro businesses; and

Recommendation 8.5: the new English RDAs and devolved authorities in Scotland, Wales and Northern Ireland should address e-commerce as a priority in their economic development strategies, where they have not already done so.

- Recommendations to build skills:  
Recommendation 8.6: set National Targets for IT literacy.

8.3 The Government’s role as an exemplar will be critical to driving both understanding and skills. Chapter eleven explores this further. In addition, training programmes in local access centres, which will be necessary to build skills in individuals, are discussed in chapter nine.

### BACKGROUND AND DEFINITIONS

8.4 E-commerce is creating new challenges which individuals and businesses need to understand and develop the skills to exploit. These challenges include:

- increasing globalisation – new business value chains and technological uncertainty (for example over the development of interactive digital TV) require new strategic thinking from businesses;

- ever increasing numbers of new products and services; and
- the need for new skills to master new technologies.

8.5 Understanding the opportunities and threats and being able to exploit them is critical to all parts of the “dynamic loop” of e-commerce. For example:

- business start-ups need to understand the opportunities and be able to recruit skilled managers and IT-enabled employees;
- established businesses need to understand the opportunities and threats to their businesses and have the skills to react to them; and
- consumers need to understand the potential benefits that they may be able to capture from e-commerce and have the confidence and skills to capitalise on these.

8.6 However, there is evidence that there is a lack of understanding and a skill gap at a general level in the population and in specific sectors of business. The recommendations in this chapter seek to address this.

## RECOMMENDATIONS AND ANALYSIS

### RECOMMENDATIONS AND ANALYSIS TO PROMOTE UNDERSTANDING

Recommendation 8.1: mount a concerted PR campaign in partnership with industry to create an e-commerce “buzz” in the UK. Commission research to identify the most appropriate branding to support this campaign.

8.7 Lack of understanding is a large barrier to the uptake of e-commerce in business. European market research suggests that many companies are deciding to “wait and see” rather than act now: 24% of companies argue that “wait and see” is their main barrier to taking up e-commerce opportunities.<sup>1</sup> While there may be advantages to “following” in the market, “wait and see” can be a risky option given the potential for first-mover advantage. This European finding is also apparent in the UK.

8.8 Understanding e-commerce is also a problem for consumers: 21% of consumers overall cite lack of understanding as a key barrier to uptake of e-commerce.<sup>2</sup>

SOURCES OF INFORMATION ABOUT ICTs USED BY COMPANIES (Micro, Small and Medium sized)

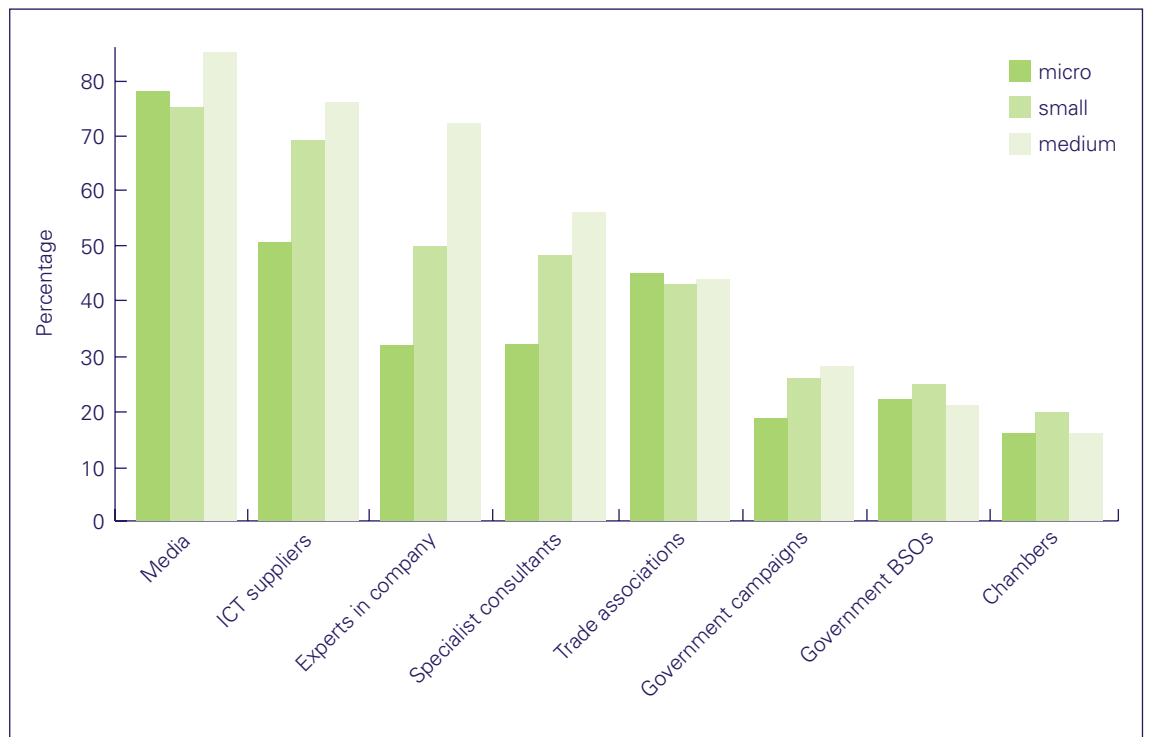
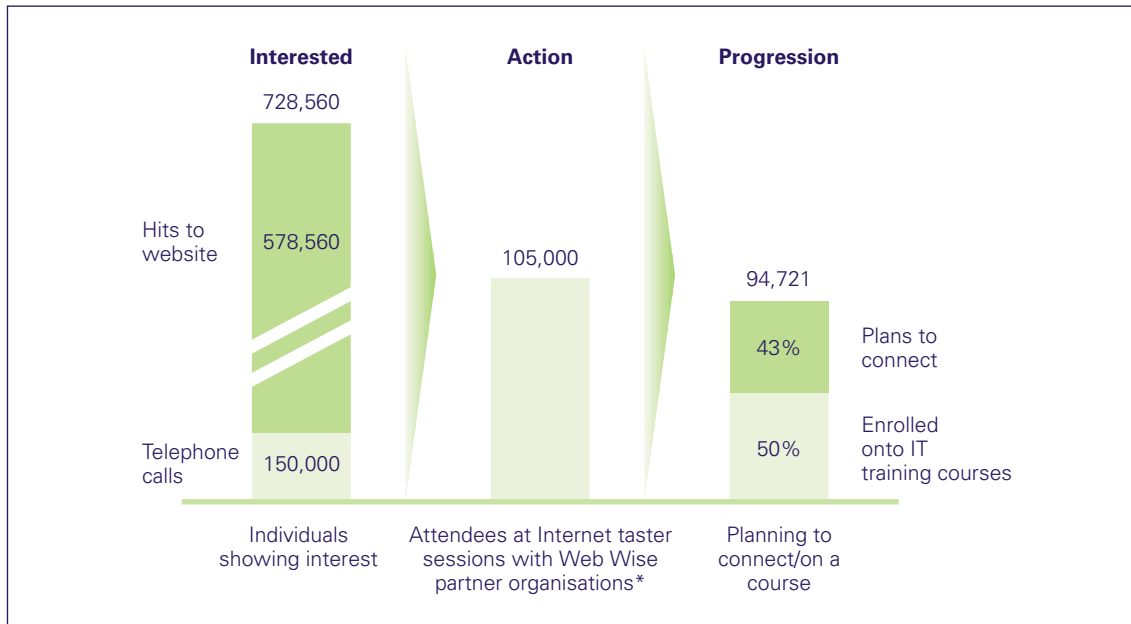


Figure 8.1

<sup>1</sup> Romtec EITO/DG3 Study – 1998

<sup>2</sup> Consumers’ Association, 1999

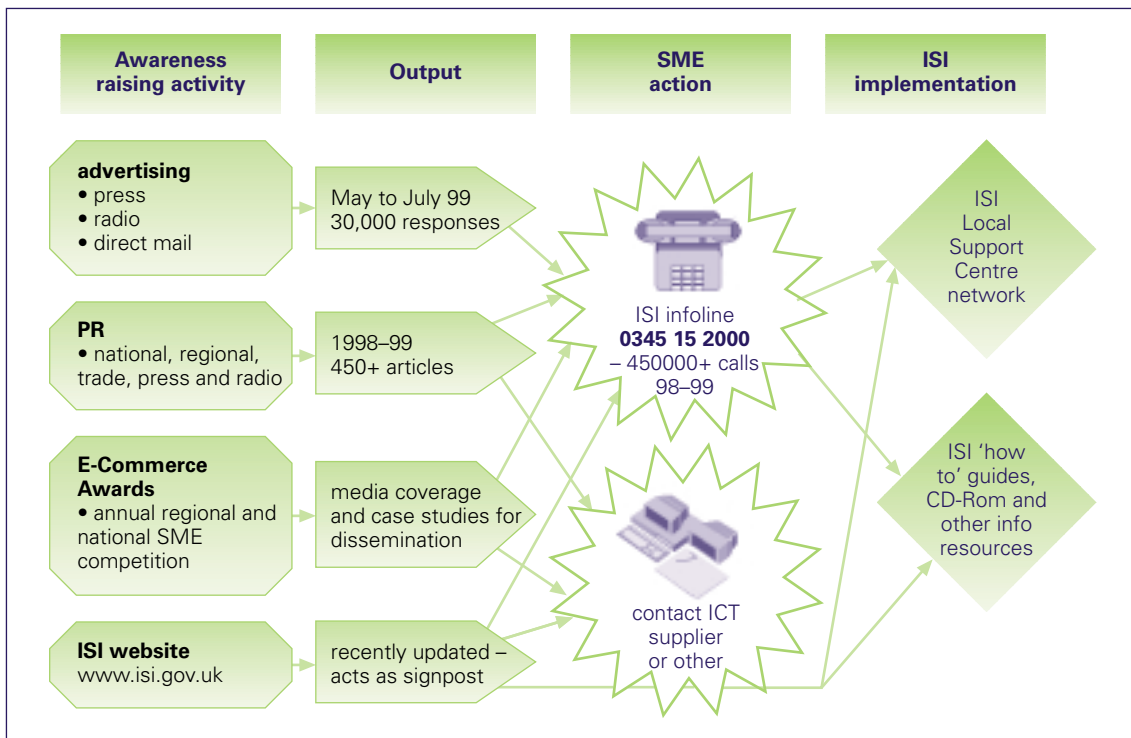
PRELIMINARY RESULTS OF BBC'S WEBWISE CAMPAIGN, MAY/JUNE 1999



\*including DTI's IT for All centres  
Source: DTI

Figure 8.2

ISI MARKETING ACTIVITIES

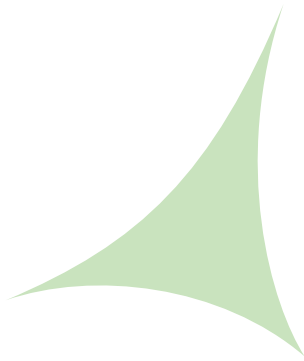


Source: ISI, DTI

Figure 8.3

8.9 The media is consistently cited by all sizes of business (and by micro, small and medium sized businesses in particular) as the principle source of information on e-commerce technologies (see figure 8.1). Moreover, the success of the Sun's

currantbun.com free ISP service in reaching a wide cross-section of the population demonstrates the power of the media to influence behaviour in the consumer sector. So too does the BBC's current WebWise campaign, which is achieving dramatic



results both in generating interest in the Internet and in turning that interest into action (see figure 8.2).

8.10 The Government media strategy for e-commerce is mainly dealt with by the Information Society Initiative (ISI) in the DTI which focuses on increasing up-take of ICTs amongst SMEs (see figure 8.3). While the ISI awareness-raising activities seek to exploit the available opportunities, they are severely constrained by modest funding, which is approved on a one-off, limited basis. For example, only £2m was available in 1999 for all the awareness-raising activity shown in figure 8.3. Moreover, there is no sustained, concerted campaign that would reach the broader business community or consumers.

8.11 At the same time, there are a large and growing number of public-sector brands in the e-commerce area. The ISI and IT for All are probably the best-established national brands, but there is a lot of promotional activity going on at a local and regional level (often resourced with European funding), and more national activity will emerge as, for example, the DFEE-funded IT Learning Centres and University for Industry come on-stream.

8.12 In order to reach the broadest audience possible, the PIU recommends a better resourced, broader and cross-Government media strategy, building on, but significantly extending, existing media work. The aim should be to achieve a step-change in understanding, in all areas of business and society, of the opportunities opened up by e-commerce. Media coverage should include UK business "success stories", together with communication of the benefits (and threats) of e-commerce to established businesses and examples of the potential benefits of e-commerce to consumers (e.g. via price reductions). All media channels, including TV documentaries, soaps etc. should be exploited.

8.13 This activity needs to be developed in partnership with industry and carefully co-ordinated across Government, as it will involve marketing to all target groups across all sectors. It is recommended that a full-time PR role is created within the new e-commerce central co-ordinating team as proposed in chapter fourteen. In particular, this new post should be given responsibility for integrating Government activity with the BBC's WebWise campaign and its planned successor for 2000.

8.14 In the short-term, this activity should seek to leverage current DTI resources devoted to this area. But these are not sufficient to carry out the breadth and scale of activity envisaged in this recommendation. It is therefore recommended that an early action for the e-envoy (see chapter fourteen) should be to commission professional advice – and subsequently present preliminary findings by June 2000 – on:

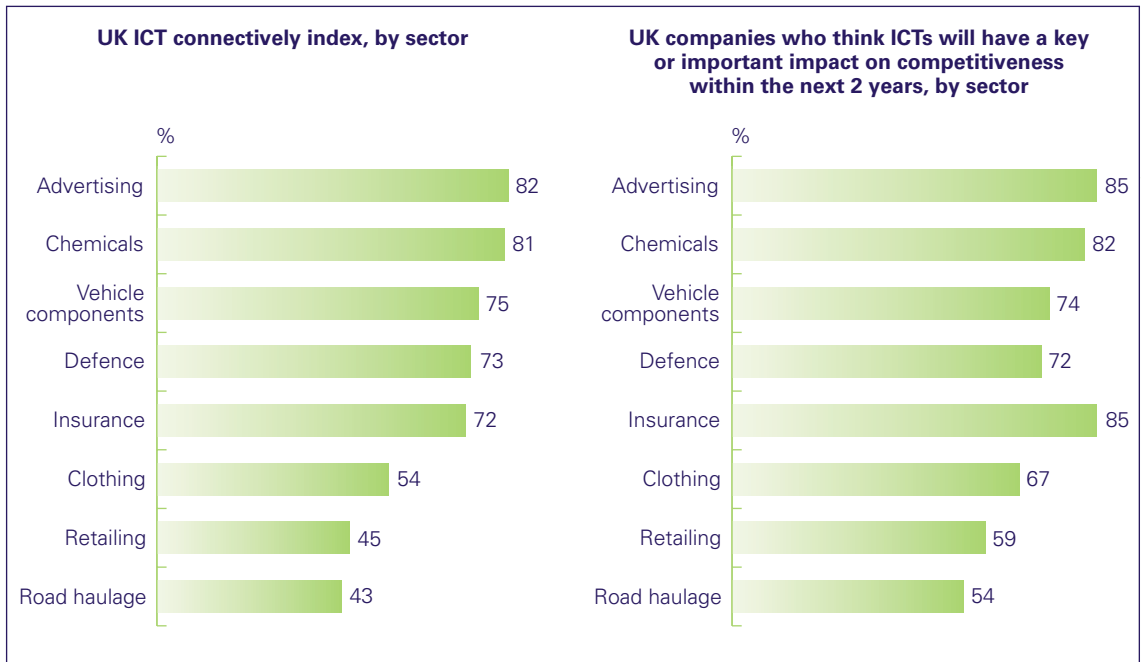
- the optimal marketing strategy for achieving a step change in e-commerce awareness at all levels of business and society – drawing on a review of the success of previous campaigns;
- the best branding to support this strategy (the research should review the scope for expanding existing brands, such as the ISI, but also look at potential new brands); and
- the level of resource needed to deliver the strategy, and the scope for leveraging in private-sector contributions to this.

Recommendation 8.2: carry out and communicate shared industry/ Government sector-specific "e-commerce impact assessments" to highlight the opportunities, threats and barriers in each sector, and in particular in the audiovisual content industry.

8.15 Some sectors are not taking up e-commerce as fast as others (see figure 8.4). A better understanding is needed of the reasons why. The PIU e-commerce Team believes that there is a role for the development of a shared understanding and vision of the impact of e-commerce in each sector, of the kind that were conducted as part of the PIU project (see Appendix two for methodology).

8.16 "Impact assessments" should be conducted by sectoral directorates within DTI (and other Government departments which have a responsibility for particular sectors), in conjunction with industry. Priority should be given to key sectors (to be identified by the co-ordinating team), and these sectors should be completed for the June 2000 Review recommended in chapter twelve. An example of one such sector is the audiovisual content industry. DCMS is particularly active in assisting SMEs in this industry to exploit the opportunities provided by digital technology and e-commerce. It is important that DCMS continues its work in

UK ICT CONNECTIVITY INDEX AND PERCEIVED IMPORTANCE OF ICTs, BY SELECTED SECTORS (%)



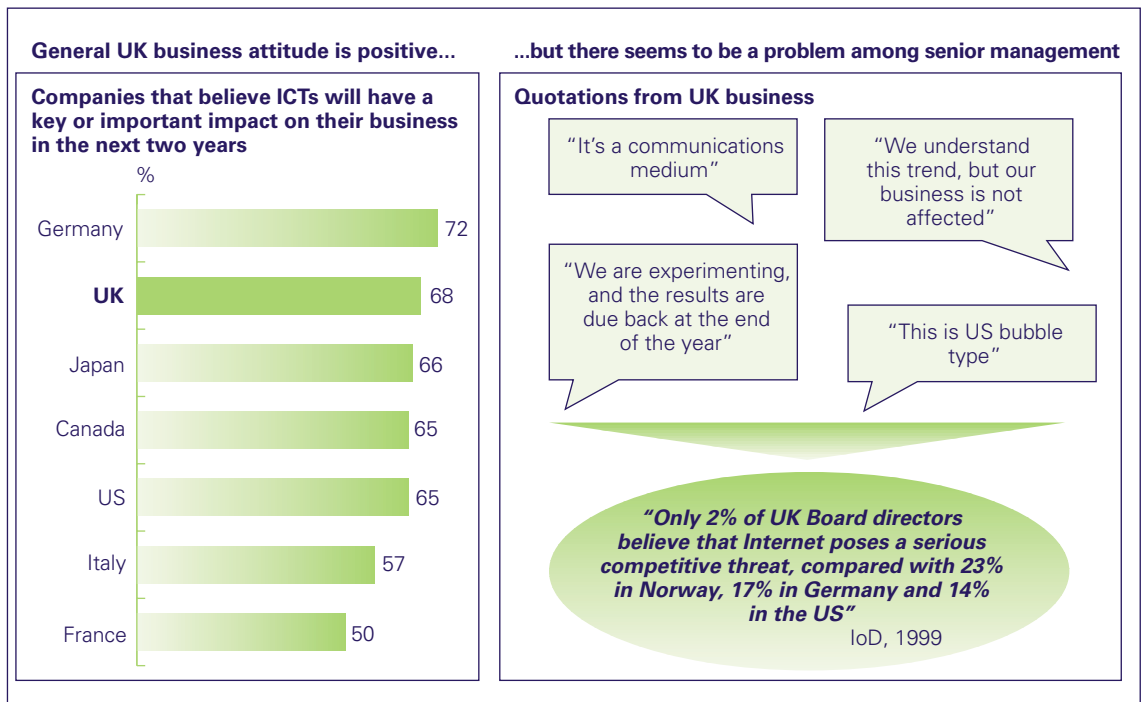
Source: Spectrum International Benchmarking Study, 1999

Figure 8.4

this area. Assessments should be co-ordinated with the regulatory reviews suggested in recommendation 7.16 and build upon the excellent work of the DTI/OST 'Technology Foresight' teams.

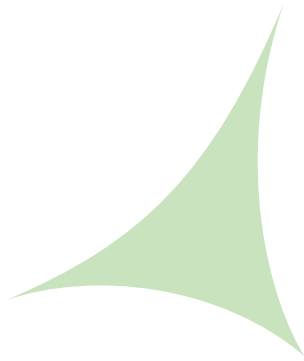
8.17 The e-envoy (chapter fourteen), should monitor the overall programme and facilitate exchange of best practice between the different sectoral approaches. Lessons from these assessments can then be disseminated through the PR campaign described in recommendation 8.1.

UK ATTITUDES TO E-COMMERCE



Source: Spectrum International Benchmarking Study, 1999, IoD; Richard Sharp, Goldman Sachs International (City conference organised by Worshipful Company Information Technologists, June 1999)

Figure 8.5



Recommendation 8.3: work with key business influencers to increase boardroom recognition of the strategic challenges of e-commerce.

8.18 General UK attitudes to ICTs are positive; for example 67% of businesses believe that ICTs will have a key impact on their businesses in the next two years, putting the UK second in the G7 on this measure. But for many businesses this belief has not resulted in a strategic level response to the opportunities and threats posed by e-commerce. A study of UK manufacturing, distribution and retailing companies in 1998 found that while 83% believed e-commerce to be crucial to competitiveness, only 21% were developing an e-business strategy.<sup>3</sup> Research *which focuses on business directors* suggests that this may be because UK top management lags behind overseas competitors in its understanding of the strategic impact that e-commerce can have on business competitiveness (see figure 8.5).

8.19 One indication of this problem is that UK businesses tend not to appoint senior directors to manage e-commerce activities. Research by the Institute of Directors last year reported that only 8% of UK businesses have an IT Director on the board, compared with 67% of US businesses.<sup>4</sup> And more recent research shows that whereas 62% of UK businesses believe it is vital to appoint an executive sponsor to manage the introduction and adoption of e-commerce, 76% of businesses have not done so.<sup>5</sup>

8.20 While the DTI is taking actions to target SMEs, there are currently no initiatives within Government which are explicitly aimed at addressing top management in larger companies (although the ISI's work on supply chains has some benefits in this area).

8.21 A campaign should be initiated immediately to create an awareness of the opportunities and threats of e-commerce among company directors, reporting findings in June 2000. This campaign should involve all the key groups able to bring effective influence to bear on company directors, including:

- promoting awareness through non-executive directors as part of good corporate governance;

- using the influence of the financial institutions (for example through the new e-Minister convening a seminar on e-commerce with City analysts, fund managers etc. to help them assess the potential opportunities – and threats – of e-commerce and the need for Director-level leadership); and
- approaching the CBI (perhaps as part of their “Fit for the Future” campaign), and Chambers of Commerce to lead an awareness campaign focused on board directors, working closely with the e-Minister.

Recommendation 8.4: develop a multi-channel marketing strategy to influence SMEs/micro businesses.

8.22 There is evidence that poor understanding is concentrated in certain groups of businesses, notably SMEs (and micro businesses in particular, i.e. those with 1-10 employees, see figure 8.6), who potentially have the most to gain from new opportunities.

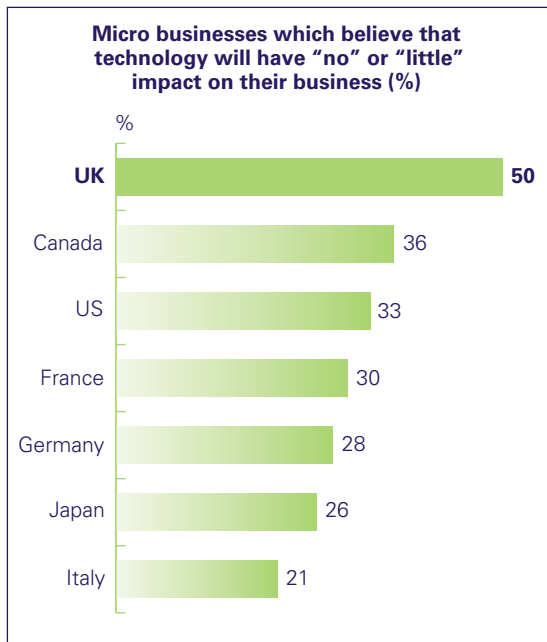
8.23 To increase support for SMEs, the Competitiveness White Paper in December 1999 announced that the existing Information Society Initiative would be extended, investing around £20m of additional funding over three years. Previously, the Initiative had focused on putting in place an infrastructure of Local Support Centres to which SMEs could turn to for advice. Under the new Initiative, greater emphasis is being given to a range of awareness and marketing activities and to improving the environment of support from all business advisors, in banks, accountancy firms as well as ICT suppliers and ISI local support centres (through an advisor skills initiative). Other elements in the strategy are represented in figure 8.7. These are aimed at achieving a target of 1.5 million SMEs making regular use of networking technologies by 2002, with 1 million actually trading on-line.

<sup>3</sup> Durlacher Quarterly Internet Report, Quarter 3, 1998

<sup>4</sup> Institute of Directors/Oracle Blueprint for Business, 1998

<sup>5</sup> PFA, 1999, sample size = 183

UK MICRO BUSINESS ATTITUDES



Source: Spectrum International Benchmarking Study, 1999 Figure 8.6

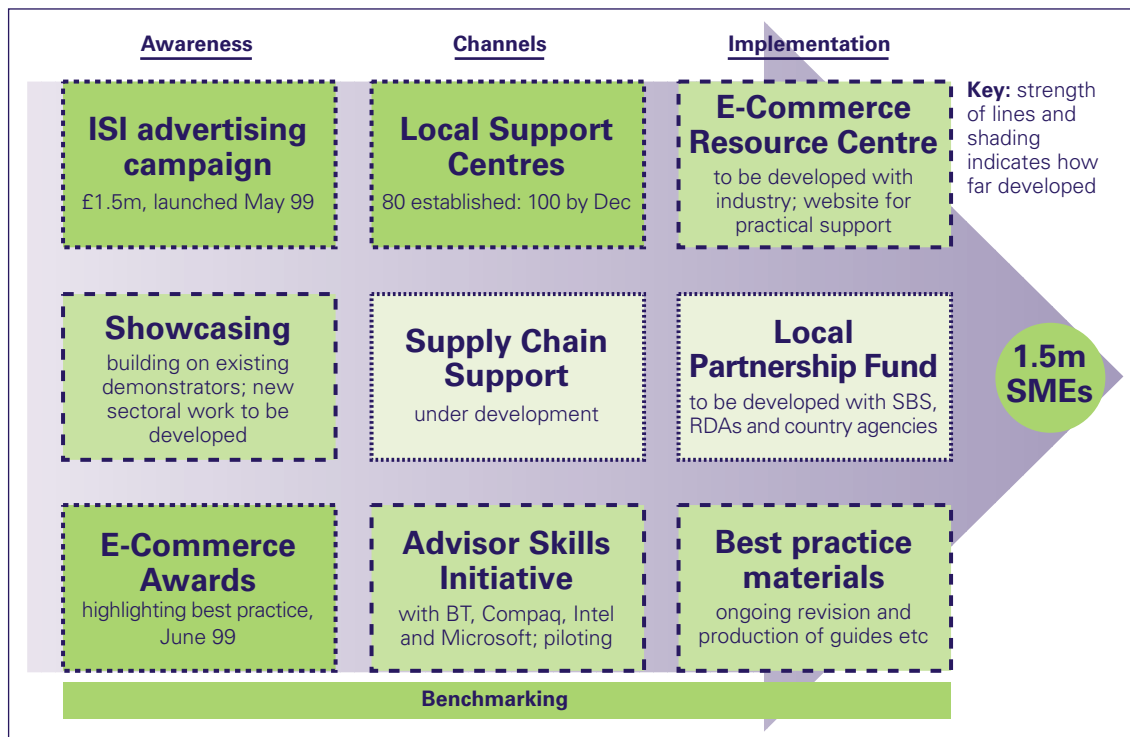
8.24 However, the most recent data from the ISI International benchmarking study, suggests even greater efforts are needed to address the under-performing small (with less than 100 employees) and micro (with less than 10 employees) businesses. The new targets set by the Secretary of State for Trade and Industry include bringing these smaller

businesses up to the level of the international best by 2002. In order to meet this, a more targeted approach is needed – clearly segmenting the very different types of businesses involved. This is underway through an Information Age Partnership sub-group and will be reporting in November 1999.

8.25 This work should be taken forward urgently, reporting preliminary findings in June 2000, and should encompass the following specific recommendations:

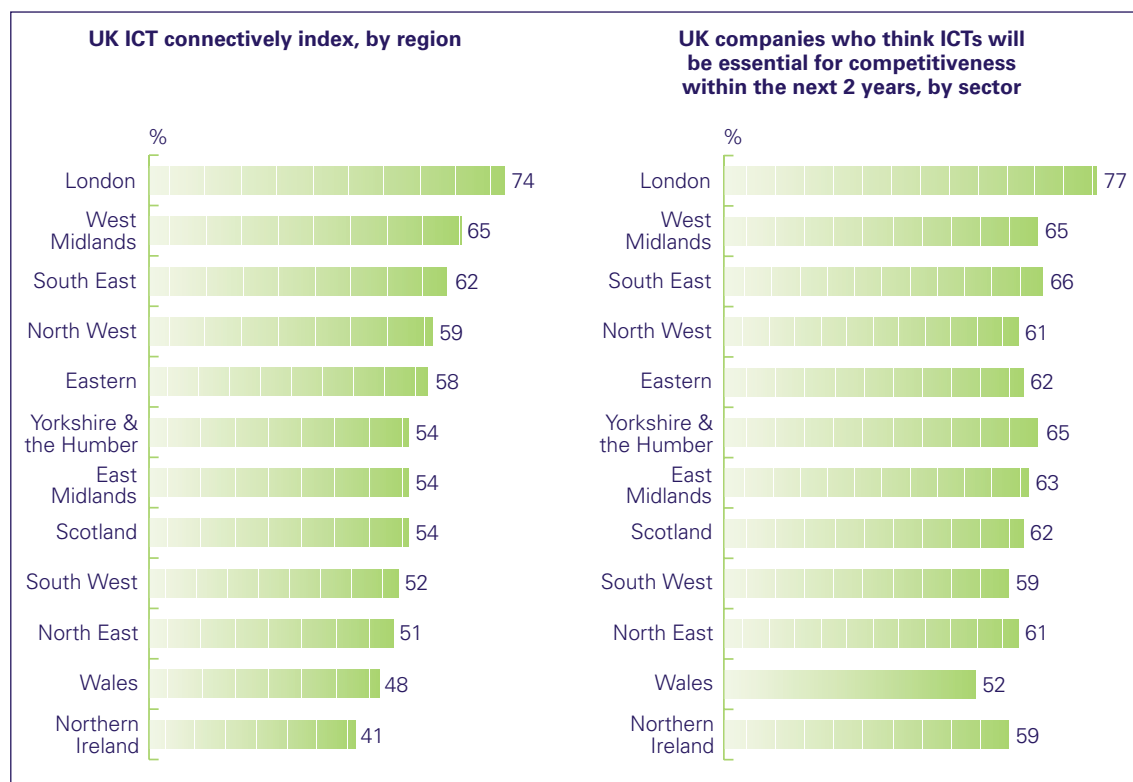
- uptake of ICTs among SMEs and micro businesses should be monitored closely. As experience this year shows, it may be necessary to change significantly targets and the direction of the ISI in the light of new data on how world best practice is moving on;
- a multi-channel communication strategy should be developed, building on the work on segmentation by the IAP and other industry contacts, to ensure that all avenues are being exploited in reaching SMEs and micro businesses. For example, this should fully exploit trade associations, which have been shown to have relatively more influence over smaller than larger businesses (see figure 8.1);
- the role of large organisations in encouraging and facilitating the uptake

ELEMENTS OF ISI STRATEGY



Source: ISI, DTI

Figure 8.7



Source: Spectrum Benchmarking Study, 1999

Figure 8.8

of new practices amongst their suppliers is one of the more powerful vehicles for change and should not be neglected. Work is under development in DTI on leveraging the power of supply chains: this should be a high priority, and closely informed by the sectoral e-commerce impact assessments described in recommendation 8.2; and

- the DTI's current advertising budget of £1.5 million in this year only funded an eight-week advertising campaign, generating over 35,000 responses from small businesses. No further campaigns on a similar scale are possible within this year's budget. It is recommended that the ISI make a more sustained commitment to advertising within the scope of recommendation 8.1.

Recommendation 8.5: the new English RDAs and devolved authorities in Scotland, Wales and Northern Ireland should address e-commerce as a priority in their economic development strategies, where they have not already done so.

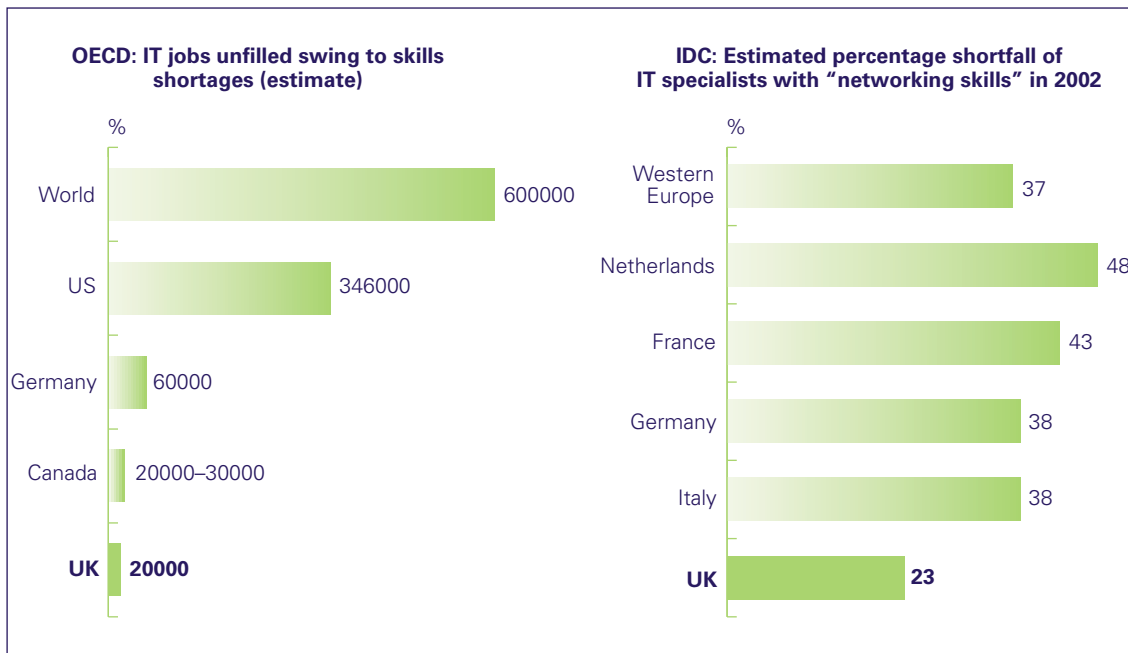
8.26 Business attitudes to the potential benefits of e-commerce technologies vary significantly across the UK (see figure 8.8).

Strategies to promote business use of e-commerce are well-developed in Scotland, Wales and Northern Ireland (see chapter thirteen); the advent of Regional Development Agencies in the English regions gives an opportunity to extend this approach nationally. As an integral part of their regional development strategies, RDAs should systematically develop a strategy for integrating local, national, and European-funded e-commerce activity at a regional level. Reporting should be in step with RDA published dates.

## RECOMMENDATIONS TO BUILD SKILLS

8.27 While it is essential that understanding the opportunities and threats created by e-commerce becomes more widespread, this may not be sufficient for change to occur – people also need the skills to exploit those opportunities. The UK faces significant skills shortages, both in terms of general levels of IT literacy and in terms of the higher-level professional skills required within the IT, electronic and communications sectors (see figure 8.9<sup>6</sup>). Although the number of IT graduates *per capita* in the UK compares

<sup>6</sup> A recent OECD report estimated there were 20,000 unfilled jobs in the UK IT sector. IDC research on behalf of CISCO predicts a UK shortfall of over 80,000 by 2002, corresponding to nearly a quarter of available jobs. While this is less of a gap than predicted for some other countries, it means that there is likely to be a considerable constraint on the growth of the UK's e-commerce enabling sectors



Source: OECD Preliminary Findings and Research Agenda "The economic and social impact of electronic commerce", 1998; IDC Report to the European Council: "Strategies for job creation in the Information Society"

favourably with that of the U.S.,<sup>7</sup> the lack of qualified IT professionals is also a constraint on e-commerce implementation in industries that use e-commerce. A recent survey by NOP<sup>8</sup> found that 34% of UK companies considered their IT departments to lack the necessary skills for managing and implementing the introduction of e-commerce technologies. This compared with more than 60% in France and just over 25% in Germany.

8.28 The Government has asked the Information Age Partnership and the National Skills Task Force to develop a national strategy to redress this skills gap. The group, chaired by Alan Stevens of EDS, is expected to report in September 1999. The recommendations of this group should be properly resourced and implemented. However, this group does not address general IT literacy problems across the wider workforce. Recommendations in this area are outlined below.

**RECOMMENDATION 8.6:  
SET NEW NATIONAL TARGETS  
FOR IT LITERACY**

8.29 Although IT literacy has been improving steadily, 40% of UK companies questioned in the 1999 Spectrum ICT Survey of Businesses<sup>9</sup> said that their employees did not have a

sufficient understanding of IT. This was the highest level of dissatisfaction registered in any G7 country (see figure 8.10). These findings are consistent with a Skills Audit by the UK Government,<sup>10</sup> in which a survey of 75 multinationals operating in the UK, US, France, Germany, Japan and Singapore rated the IT skills of the UK workforce as the weakest of all six countries examined. The IT National Training Organisation reports that although half the UK workforce use computers, no more than an estimated 5-8% have a Level 2 competence in the use of IT.

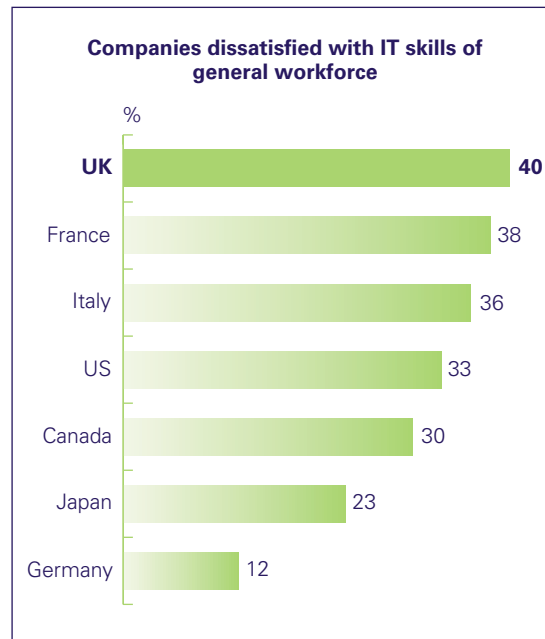
8.30 Businesses are taking the initiative to train employees at work, although this varies across the country. 42% of London companies are providing ICT training "frequently" or "quite often", but this drops to 28% in Northern Ireland, where ICT uptake is lowest among business.<sup>11</sup> Moreover, those regions and countries which are most concerned about skills gaps tend to be those where businesses provide least ICT training for their employees.

8.31 The Government's strategy has been focused on the education system, where by 2002 it aims to have:

- connected all schools, colleges, universities, libraries and as many Community Centres as possible to the National Grid for Learning;

<sup>7</sup> McKinsey Productivity Report, 1998  
<sup>8</sup> PEECCS 98 e-commerce survey  
<sup>9</sup> Spectrum ICT Survey of Businesses 1997/1998/1999 by NOP Research Group  
<sup>10</sup> The Skills Audit, DfEE and Cabinet Office, 1996.  
<sup>11</sup> Spectrum ICT Survey of Businesses, 1999

## BUSINESS ATTITUDES TO WORKFORCE SKILLS



Source: Spectrum International Benchmarking Study, 1999 Figure 8.10

- ensured that all teachers feel confident and are competent to teach using ICT within the curriculum;
- ensured that librarians are similarly trained; and
- enabled school leavers to have a good understanding of ICT, with measures in place for assessing their competence in it (although no such measures have yet been defined).

8.32 Policy towards employer-based training, however, has not directly addressed IT skills issues. Instead, it has focused on generic skills issues such as promoting Investors in People and Modern Apprenticeships/National Traineeships. (Modern Apprenticeships/National Traineeships do cover "Key Skills" – which include a Unit in IT – but these only reach a very small proportion of the workforce.) This gap will be remedied, to some extent, in the autumn of 2000 with launch of the University for Industry. IT skills will be a priority area for the University for Industry, which will provide distance-learning opportunities up to Level 3 in ICT. However, if we are to achieve the radical improvement in IT skills which are required in a modern economy, then providing the infrastructure is only an important first step. In addition, IT literacy has to become embedded in national, regional and local skills strategies aimed at achieving quantifiable targets. Some Government departments too have

been active in pursuing ICT training, notably the MoD.

8.33 The Team therefore recommends that the Government should express its current 2002 target for school leaver competency in ICT in more specific terms. The target should be formally incorporated within the strategies of DfEE, Regional Development Agencies and the Learning and Skills Council. This target should be defined by March 2000, and – in recognition of the vital nature of these skills to a modern economy – should be stretching. The Team believes that an appropriate target would be:

- 90% of all school leavers should be accredited to Level 1 and 70% to Level 2 in IT skills by 2002.

This target also recognises the size of the Government's investment in ICT in schools which has helped move the pupil:computer ratio in secondary schools from 9 pupils to each computer to 8 pupils to each computer within the last year. The movement in primary schools is even more significant from 18:1 to 13:1 although the effect of this will clearly take time to work through to school leavers.

8.34 Further work will also need to be carried out urgently to define a practicable way of measuring performance against this target. This should also be completed by March 2000. One option might be for IT to form part of wider Key Skills Qualification targets, provided that these included a specific IT component along the lines recommended above. Work is already in hand on this in DfEE and the Qualifications and Curriculum Authority. It is suggested that this work should examine the scope for promoting the European Computer Driving Licence (a pan-European accredited qualification which is already used by many British organisations, particularly those with offices on the Continent) as a qualification demonstrating the Level 2 standard in the proposed new target.

8.35 In addition the Team feels that a target should be set for the workforce as a whole. However, it is apparent that much work will be needed to determine baseline data for existing IT skills in the workforce, the requirements of employers, the appropriate level for a target and an understanding of how it could be achieved and measured. It is therefore recommended that the Learning and Skills Council work towards establishing an IT target by the end of 2002.

## 9. ACCESS

### SUMMARY

9.1 The ability to access high quality electronic content at reasonable cost is a prerequisite to the UK competing effectively with its international rivals in e-commerce. The access challenge the UK faces is to achieve widespread low-cost, high-bandwidth, competitive access – whilst ensuring social inclusion.

9.2 This chapter focuses on what access is, why it is critical, how well the UK competes and what can be done to improve the country's position. The recommendations have three main aims: to remove unnecessary barriers to novel tariffs; to remove barriers to the roll-out of high-bandwidth technology; and to ensure the success of inclusive access initiatives.

### REMOVE UNNECESSARY BARRIERS TO NOVEL TARIFFS

9.3 E-commerce telecommunications usage is different to voice traffic – calls tend to be much longer. UK tariff structures should not create inappropriate disincentives for spending time on-line relative to international rivals. The PIU recommend that the new e-Minister, working with OFTEL/DTI, remove unnecessary barriers and that:

- Recommendation 9.1: telecommunications operators should be encouraged to offer a wider range of tariff structure options.
- Recommendation 9.2: telecommunications operators should be encouraged to explore new commercial interconnect

arrangements with BT, allowing more flexible retail tariffs.

### REMOVE BARRIERS TO RAPID ROLL OUT OF HIGH-BANDWIDTH TECHNOLOGY

9.4 Many new e-commerce services require high-bandwidth connections. Barriers should be removed which hinder the competitive roll-out of new high-bandwidth technologies, particularly Digital Subscriber Loop (DSL). OFTEL's "Access to Bandwidth" programme aims to achieve this. However, largely as a watching brief, PIU also recommend that:

- Recommendation 9.3: OFTEL ensure BT's DSL roll out plans do not give it unfair competitive advantage.
- Recommendation 9.4: e-Minister/DTI ensure that OFTEL has sufficient resources to meet DSL roll-out timetable.

### ENSURE SUCCESS OF INCLUSIVE ACCESS INITIATIVES

9.5 Various sections of society may not have opportunities to access e-commerce markets. Government currently has many initiatives to remedy this. To maximise the chances of success, PIU recommend that the e-Minister facilitates:

- Recommendation 9.5: better co-ordination and marketing of access initiatives.

- Recommendation 9.6: the monitoring of priority excluded groups.
- Recommendation 9.7: the combination of skills training with the provision of access.

## BACKGROUND AND DEFINITIONS

9.6 This section describes what access is, the focus of the Team's concerns within access, why access is critical, and a cost-quality-choice framework for assessing change to the current situation. The main points made are:

- access is critical to e-commerce success; and
- telecommunications is the access priority, focusing on higher performance and more appropriate local access technologies.

### ACCESS IS CRITICAL TO E-COMMERCE SUCCESS

9.7 Access is clearly critical to the successful development of e-commerce in the UK. First, favourable access conditions will greatly facilitate the creation of "critical mass" for the development of e-commerce. Second, access is the first step to engaging in e-commerce. Third, this pivotal role has been recognised by leading e-commerce nations and they are rapidly liberalising their telecommunication regimes to grasp the opportunity, resulting in access becoming the main axis of international e-commerce competition. These points are explored further below.

9.8 In e-commerce there is a 'chicken and egg' problem: e-commerce businesses will not be created if there is no perceived demand for services; there will be no perceived demand if buyers and suppliers cannot successfully get on-line. It is imperative, therefore, that access does not become a barrier to the establishment of e-commerce in the UK. Economists say there are strong "network externalities" at play in e-commerce. This means that the more participants there are on the network, the greater the value to everyone involved. More buyers mean a greater customer base for potential sellers; more sellers means more competition and hence keener prices and

better service for consumers. This takes place at both a global and UK level. Once a "critical mass" of e-commerce participants is achieved, a virtuous cycle of reinforcing benefits takes place. If access is poor though, either through high costs or low quality, then there will be fewer participants in the network. Part of the US's lead in e-commerce is said to be due to the very low incremental costs of Internet access (based on unmetered local calls – no per-minute charge) resulting in a more rapid creation of the "critical mass" required.

9.9 Access is a main axis of international e-commerce competition. The leading e-commerce nations have all recognised the importance of access and are racing to liberalise telecommunications markets in order to deploy high bandwidth networks. Not only does good access favour domestic buyers and suppliers, but it also attracts international e-commerce players. Given the instant global presence e-commerce commands, nations with the most favourable access conditions are likely to become the regional hub for many e-commerce businesses. If this is a role the UK aspires to, then competing internationally on access is key.

### TELECOMMUNICATIONS IS THE ACCESS PRIORITY

9.10 When buyers and suppliers want to interact with each other they do not just need a telecommunications connection. To access e-commerce, users need to go from connection, through navigation to transaction. These stages are explored below.

9.11 Domestic and small business connection to the Internet usually involves use of a computer and modem to "dial up" an Internet Service Provider (ISP) over standard telephone lines. The ISP then connects the user to the Internet. The speed of access can be increased by converting the telephone line to ISDN. Larger users tend to use leased lines which connect directly to the Internet (although also usually via an ISP). These are "always on" connections supplied on a rental basis (i.e. there are no 'time related' charges). There are currently three main cost elements to ordinary dial up access:

- computer costs – the cost of buying a computer and modem can be a significant barrier for residential and some SME users;

- telecommunications line rental and call charges – these cover the cost of the using the telecommunications network; and
- Internet Service Provider (ISP) costs – these cover the costs of the infrastructure beyond the telecommunications network needed to access the Internet and the services provided by the ISP. “Free” ISPs such as Freeserve recoup their costs through the telecommunications charge, instead of a subscription charge.

end of the access equation. This is because telecommunications access:

- was consistently cited as a major barrier to doing e-commerce in the PIU’s interview, seminar and research programme;
- currently contains a major bottleneck in the form of BT’s dominance (albeit regulated) over the final connection to most consumers; and
- is where most technological and regulatory change is currently taking place.



9.12 New, fast methods of accessing the Internet are also starting to grow (see next section). These overcome some of the existing problems associated with the use of the ordinary telephone network for dial-up access, as their costs are not affected by the amount of time that users are connected. BT has announced its plans to roll-out technology that enables services including fast Internet access, to be delivered over normal telephone lines. Fast access via cable networks (which require a ‘cable modem’) has been started by one company and is expected soon on the networks of the other two cable companies. Fast Internet access is also being offered via satellite (with the return path via the telephone line) and terrestrial broadcast methods. Consumers will, in the future, be able to access some Internet services via satellite through digital television set-top boxes or integrated digital television sets. Finally, high-bandwidth connections via mobile phones will begin from 2002.

9.13 Navigation is needed to search and find your way around the Internet. Much experience in this area has already been gained in the (closed) ‘extranets’ used in ‘process’ e-commerce (see chapter twelve) – especially within manufacturing industry. In ‘open’ and business-to-consumer applications, navigation software, search engines and portals are dominated by US companies. Secure and safe transaction software and standards are also needed (see chapter ten). To be able to transact usually means, in the case of ordinary consumers, access to credit cards. In the case of suppliers it means the ability to handle credit cards (an issue for new on-line businesses – see chapter seven)

9.14 In analysing access, the PIU’s focus has been on the telecommunications connection

#### “FREE” INTERNET ACCESS

In September 1998 Dixons launched Freeserve – an ISP service with no monthly subscription charge. Instead, they get a share of the call revenue paid by the consumer. Freeserve (and numerous similar companies) have dramatically expanded the number of new Internet users, as well as capturing market share from rivals which have retained subscription charges. Some free ISPs, such as X-Stream, have now begun also to reduce call charges for using the Internet. X-Stream offers unmetered off-peak connection through 0800 numbers. This type of competition in the ISP sector has brought new, more price sensitive consumers on-line.

The UK leads in the provision of free ISPs. However, they are now appearing in other EU countries such as France.

*Box 9.1*

9.15 The Team did not focus on the other elements of the cost to users of dial-up access (i.e. the cost of PCs and ISP charges) or the cost of leased lines for larger users. This does not mean that they are unimportant. As noted above, the cost of PCs can be an important barrier to getting on-line and OFT and DTI are looking into the price of PCs as part of their inquiry into “high price Britain”. The ISP end of the market is of less concern. It is extremely competitive and the introduction of the “subscription free” ISP, such as Freeserve (see box 9.1), has significantly reduced the cost of using the Internet and boosted Internet use in the UK. As for leased lines, although OFTEL has concerns about charges in the UK, the market for high capacity circuits is broadly competitive. OFTEL is currently investigating whether there is sufficient competition in the market. The next section addresses the



specific recommendations the Team have put forward to improve access and thus achieve the Government's e-commerce goals.

## RECOMMENDATIONS AND ANALYSES

9.16 The PIU's overall pro-business, pro-market approach argues strongly that competition is the best mechanism to quickly develop optimum access technologies and tariffs for the UK. Competition will ensure that access costs are kept low. It should also ensure the quickest roll-out of new technologies. There should not be excess intervention by Government. The role of Government and OFTEL is to ensure that market mechanisms are allowed to operate and remove barriers to competitive access for business and consumers.

9.17 However, certain sections of society may be excluded from the e-commerce revolution, despite competitive improvements. Government's main aim over such distributional considerations should be to tackle the reasons for exclusion at source (e.g. poverty), rather than risk distorting e-commerce markets through inappropriate, general intervention. Government efforts to provide access for excluded groups should be co-ordinated to ensure the optimum allocation of resources.

9.18 The remainder of this section explains the rationale behind the three main aims for the access recommendations, namely to:

- remove unnecessary barriers to novel tariffs;
- remove barriers to rapid roll out of high-bandwidth technology; and
- ensure success of inclusive access initiatives.

### REMOVE UNNECESSARY BARRIERS TO NOVEL TARIFFS

Recommendation 9.1: telecommunications operators should be encouraged to offer a wider range of tariff structure options.

Recommendation 9.2: telecommunications operators should be encouraged to explore new commercial interconnect arrangements with BT, allowing more flexible retail tariffs.

9.19 The first challenge the UK faces is ensuring that existing e-commerce access tariffs and tariff structures are competitive with international rivals. To support the recommendations in this area, the following arguments are put forward and examined further below:

- both structure and level of tariffs affect on-line behaviour;
- some UK tariffs are disadvantageous;
- action is being taken on tariffs; and
- removing barriers to novel tariffs is a key access challenge.

9.20 To engage in e-commerce, buyers and suppliers need to spend time on-line – browsing, ordering, purchasing, and in some cases downloading electronic goods and services. The amount of time they spend will depend on both the level and structure of telecommunications charges. It also depends on the speed of access, which is discussed in the next section.

9.21 Evidence from surveys of UK users (figure 9.1) shows the importance for individuals of access costs in the decision to go on-line. However, in the business sector, DTI's Information Age benchmarking studies show that access costs are not closely correlated with business uptake of the Internet across the G7, although smaller companies are more price sensitive. It is important to remember that behaviour may be affected not simply by the absolute level of the charges, but also by the balance between fixed and usage charges. Casual empiricism supports this relationship. In the US, which often has zero usage charges for local calls (including calls to the Internet) – but higher charges for other types of call and line rentals – the average time spent on an Internet call is two and a half hours. In the UK, which has time-based usage charges, it is 25 minutes. Again, in the US, in December 1996, AOL changed from per-minute to flat-rate charges and saw connection time increase from 14 minutes to 35 minutes within three months. In contrast to the fixed network market, the mobile phone market

WHICH FACTOR WILL ENCOURAGE YOU TO START USING, OR INCREASING YOUR USAGE OF THE INTERNET?

Internet Usage Motivators	Total (n=4,944)	Use & intend to continue (n=882)	Use & intend to stop (n=99)	Don't use but intend to start (n=406)
1. Lower cost of ISP subscription	10%	23%	24%	12%
2. Cheaper PCs/Multimedia PCs	6%	10%	12%	9%
3. Easier Access	7%	20%	18%	16%
4. Free/No Access Restrictions at work	3%	8%	1%	6%
5. Learn more about it (more familiar)	8%	11%	4%	29%
6. More relevant/useful info	5%	11%	6%	14%
7. No need/no use for it	25%	1%	15%	3%
8. Don't know enough about it	6%	1%	3%	4%
9. Other	12%	27%	9%	27%
10. Don't know	33%	21%	32%	11%

Base: All random omnibus respondents 15+ (recruitment waves 1–3 only. 14th October – 10th November n= 4,944 1998)

Figure 9.1

Source: NOP

has many different packages available for customers – depending on whether they are frequent or occasional users. From this the Team concludes that the structure of tariffs is a critical driver for e-commerce, not just their absolute level.

9.22 The ideal levels of fixed and usage tariffs depend on the cost structure of the technology and demand conditions. The costs of providing circuit switched telephone calls (see paragraph 9.36) depend on the amount of switching capacity required and the number of circuits needed at peak times of the day. These in turn are driven by the number and duration of calls at particular times of the day. Line rentals, similarly, should reflect the costs of providing lines into consumer's premises. These are not affected by the number or duration of calls.

9.23 However, there are a number of reasons why tariff levels and structures might not be ideal at present. The first is market power. Where markets are not competitive, prices are unlikely to be set at appropriate levels – although in principle this problem is addressed by OFTEL's regulation of BT's retail prices and interconnection charges for services which are not fully competitive.

9.24 Second, BT's tariffs are not balanced – the line rental set by BT is below cost and the retail price of calls is above cost. This regime is a historical legacy. Although BT has the freedom to rebalance charges, it is difficult for it to do so – as increases in line rentals generate bad publicity. Such increases would also adversely affect certain groups of low-volume users. In terms of e-commerce, however, the fact that call charges are necessarily high, to cover costs, creates a disincentive to stay on-line for the typically longer connection times that e-commerce requires. A rebalanced tariff package, with higher line rental and lower call charges, would be beneficial to users of e-commerce.

9.25 Third, as noted above, with current technology the cost of calls is driven by both the number and duration of calls. By charging only by call duration, long duration calls are overcharged. This is disadvantageous to e-commerce, which relies on long duration calls. New tariff options might have a better balance between "per call" charges and duration charges, for example through discounts for long duration calls.

9.26 Finally, in mobile telecommunications – as opposed to fixed telecommunications – there are a wide variety of packages geared to different usage profiles, in particular these

vary the balance between rental and usage tariffs. A wider variety of tariff options for fixed-link telecommunications too could allow e-commerce participants to select a package which better suited their longer call time profile. Indeed, this is already starting to happen – for instance NTL have recently introduced a charge of one pence per minute for Internet access at all times.

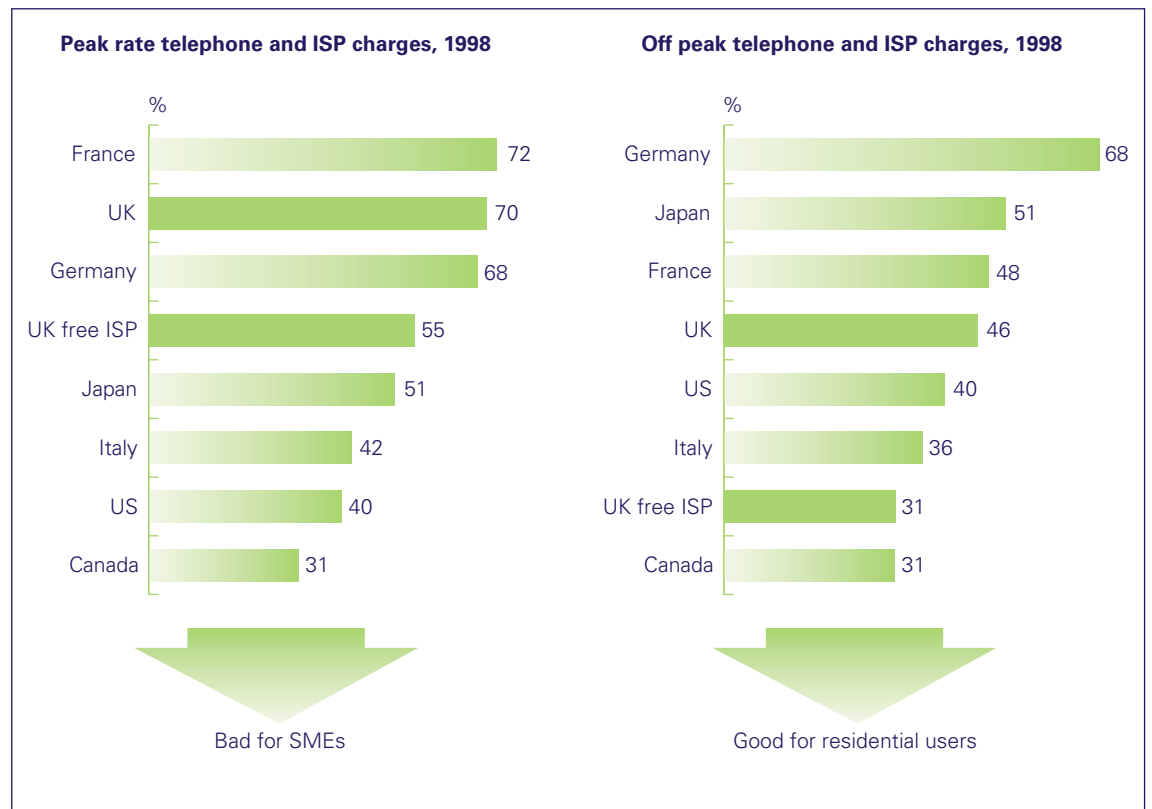
9.27 While there are reasons for considering that some tariffs are too high and that there is an inadequate range of tariff packages, there are also disadvantages to inappropriately low charges. Congestion, cross-subsidisation and monopolisation are the main risks. There have been a number of instances cited, in the US, of networks becoming congested with Internet traffic, particularly in heavy Internet using communities. Where local-call charges are zero some users even leave the line open continuously, despite sending little or no traffic for long periods. For historical reasons, the UK has a closer balance between the size of the network and demand. Very low charges could therefore create problems of excess demand. On the other hand, the danger of a high fixed charges and low usage charges is that short-duration users will

subsidise long-duration users. A menu of tariffs might prevent this. In the UK, BT is still the originating operator for 85% of residential homes (despite 50% of homes having cable as an alternative and the option of indirectly accessing another operator). If BT were to offer unmetered services, albeit under the guise of promoting e-commerce, this could further entrench their position – unless countervailing measures were taken to ensure equal access for competitors and appropriate interconnection charge arrangements, such as charges that were less related, or unrelated, to the duration of the call.

9.28 It is clear that the level and structure of access tariffs affect customer and business behaviour and getting this right is critical in achieving the UK's e-commerce ambitions. The remainder of this section addresses the comparison between the UK and its international competitors in terms of access costs.

9.29 In 1998, the UK had a middle ranking compared to its international competitors in terms of Internet penetration (see chapter four). The UK also has a middle ranking in terms of cost of access. It is possible that the

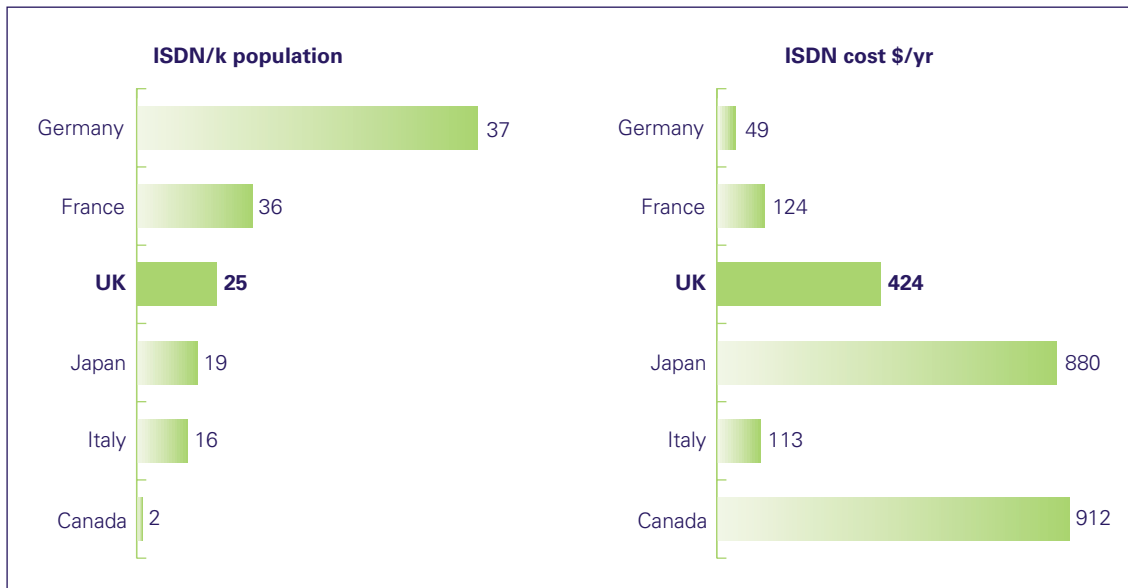
UK IS EXPENSIVE FOR PEAK USAGE CHARGES



Source: OECD

Figure 9.2

## UK HOLDS MIDDLE RANK IN ISDN PRICE AND PENETRATION



Source: OECD

Figure 9.3

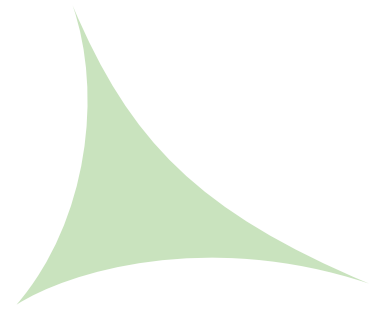
latter may be a causal factor in the degree of Internet penetration. On average UK costs compare favourably with other OECD nations when it comes to the standard access costs. However, as figure 9.2 shows, the picture is somewhat more complex when disaggregated. The daytime, or peak, call charges for Internet access are higher than average, if a free ISP is not used – disadvantaging SMEs who will wish to use the Internet at this time. On the other hand, off-peak (evening and weekend) charges are good value for individual users of the Internet in the UK. Those using a free ISP at this time, at the level of usage selected by the OECD study, in fact pay lower average charges than users in the US. However, at a higher level of usage than that identified by the OECD study, the UK would be more expensive. Higher up the bandwidth spectrum, figure 9.3 demonstrates that the UK also has a middle ranking in terms of ISDN penetration and access charges.

9.30 As shown above, SMEs continue to be somewhat disadvantaged in the UK by the continued high cost of peak-time calls. SMEs are vital to the economy (half of UK workers work for companies with less than 250 employees) and they should undoubtedly play an important role in developing e-commerce in the UK. However, the findings of a DTI study (figure 9.4) show that that this business sector is less engaged with e-commerce than many of its international counterparts. It is possible that one cause of

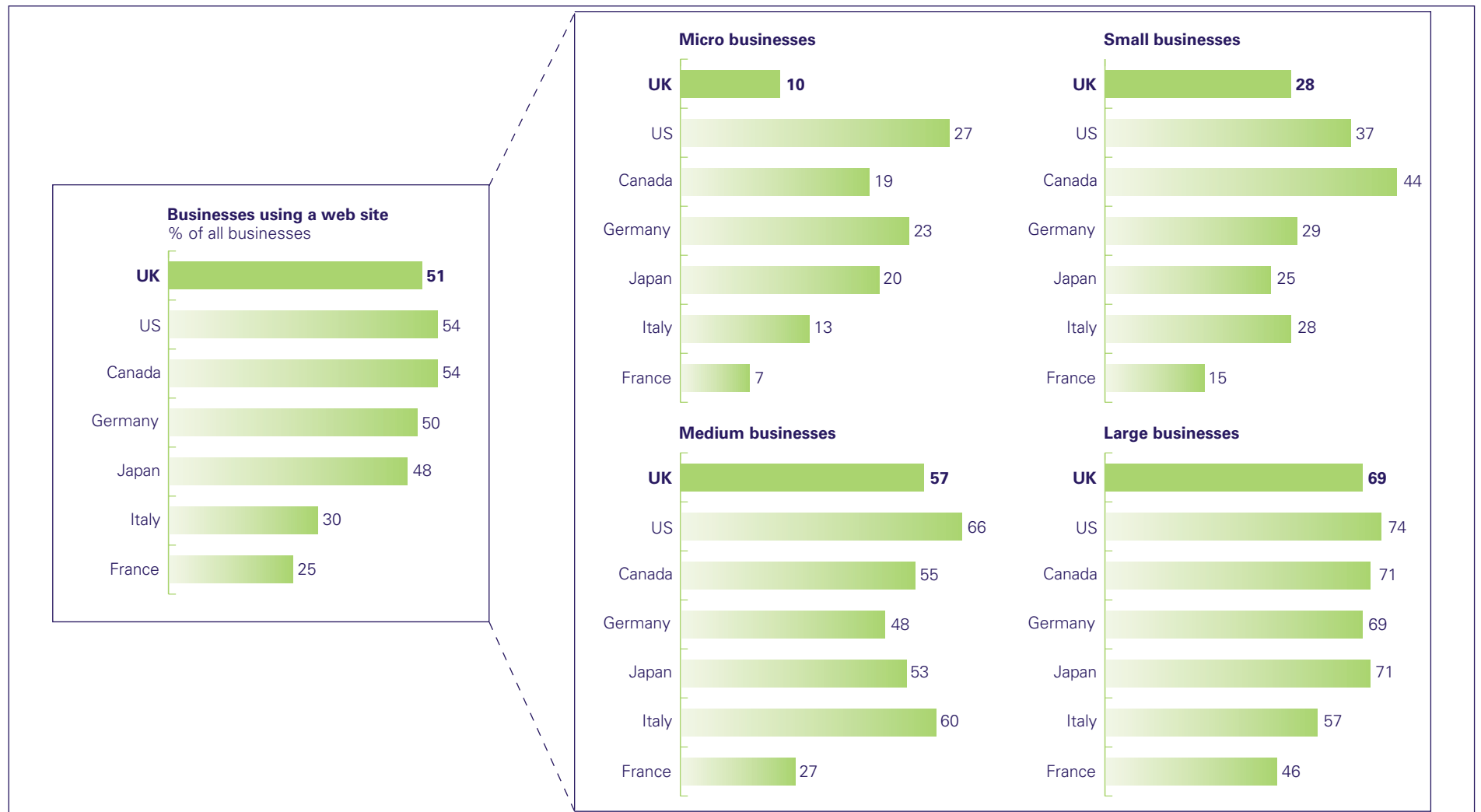
this may be the relatively high cost of peak-time access. Any residual unnecessary tariff barriers in this area should therefore be addressed.

9.31 The market and Government are responding to the new demands of e-commerce in terms of tariff structures. Competition has already resulted in many ISP's costs being funded out of call revenue and consequently in reductions in Internet call-charges by these companies. Fierce competition between ISPs is likely to result in continued benefit to the consumer. OFTEL has commenced the next round of the Price Control Review of telecommunications price regulation in the UK. In this process it is considering, among other things, "tariff rebalancing", interconnection charges and many other factors which affect tariffs in the UK. Most importantly it is considering whether there is a continuing requirement for price and charge controls. However, the process will not finish until 2002.

9.32 It must also be noted that the source of many of the current difficulties over tariffs is the infrastructure over which most telecommunications are presently routed – the "Public Switched Telecommunications Network" (PSTN). Incumbent telecommunications operators are working hard both to introduce "Intelligent Networks" (IN), that will enable them rapidly to change tariffs in order to meet customer requirements, and to use the same method



IN PARTICULAR, UK SMES LAG INTERNATIONAL RIVALS IN WEB SITE USE



Source: DTI Spectrum Benchmarking Study 1999

Figure 9.4

of routing calls as the Internet – “Internet Protocol”. This will greatly reduce the cost of providing for ‘always on’ attachment to e-commerce Nets (see box 9.2).

#### PSTN AND IP

Currently, telephone calls use the (circuit-switched) Public Switched Telephone Network (PSTN) – where a path is opened across the network between the calling parties for the duration of the call. In an Internet Protocol (IP) communication, on the other hand, the call is divided up into many small packets, which are sent individually by any number of different routes and reassembled at the other end. Both circuit switched telephony and IP data are conveyed in a digital form, and digitisation of the network has allowed telecommunications operators to offer many new services to users. And rationalisation of switching methods leads to savings for operators.

*Source: PIU Report – ‘Encryption and Law Enforcement’*

*Box 9.2*

## REMOVE BARRIERS TO RAPID ROLL-OUT OF HIGH-BANDWIDTH TECHNOLOGY

Recommendation 9.3: OFTEL ensure BT’s DSL roll out plans do not give it unfair competitive advantage.

Recommendation 9.4: e-Minister/DTI ensure that OFTEL has sufficient resources to meet DSL roll-out timetable.

9.35 The quality of Internet access is also a determinant of how much it will be used. High quality access in e-commerce usually implies high-bandwidth, which means faster data transfer rates. The infrastructure requirements for e-commerce are changing rapidly as new products and services develop. Typically this means more bandwidth is demanded. Existing telecommunications networks were engineered for the demand structures and usage patterns of voice telephony, and do not adequately support the fast data transfer requirements of e-commerce. Inadequate infrastructure will create disincentives to the growth of e-commerce services. Although these problems are being addressed by the introduction of IN and IP (see paragraph 9.32), it will be necessary to ensure that the technology and infrastructure does not constrain effective demand and hinder business and. In support of the recommendations in this section it is argued that:

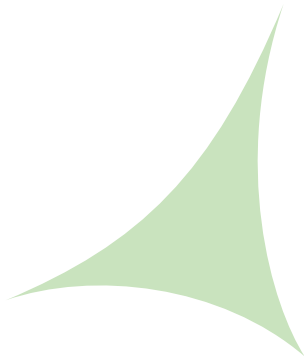
- technology determines access quality and choice;
- there are barriers to broadband roll out; and
- rapid roll out of new technologies is needed.

9.36 Business and consumers wishing to fully participate in e-commerce activities need fast, high-bandwidth access to complex text and graphics, sound and video. For larger businesses, high-bandwidth data transfer is achieved by using, for example, leased broadband fibre-optic cables. However, such cables are not economic for homes or small businesses. In the UK more than 85% of access lines are through BT’s “local loop”. This part of the network, also known as

9.33 The PIU recommend that the new e-Minister, working with OFTEL/DTI, encourages the telecommunications operators to offer a wider range of tariff options. BT too should be encouraged to offer a broader range of tariff options which allow both heavy e-commerce users and light users to choose the optimum package for their usage profile.

9.34 In addition, telecommunications operators should be encouraged to explore new types of interconnection agreements with BT with a view to offering different types of retail tariffs to e-commerce customers. These might include, for example, fixed-charge deals or different interconnection charges for Internet traffic (i.e. end-use charging). The only regulatory barriers to such deals are BT’s licensing conditions which:

- require that deals do not unduly discriminate between operators/ISPs; and
- impose restraints on BT’s revenue from interconnection services (under retail price index controls).



“the last mile”, delivers “narrowband” services such as basic telephony and low speed data services (including ISDN). The demand for data services is increasing – in October 1998, for the first time in the UK, the volume of data traffic exceeded that of voice traffic. Although it is difficult to predict the level of demand for high-bandwidth data services – because of the limited supply – new technologies are being developed. These include:

- Digital Subscriber Loop (DSL): which enables the ‘local loop’ to be upgraded to offer high-bandwidth data services – BT has now announced plans for the roll out of DSL technology;
- Cable Modems: which enable cable TV operators to offer high-bandwidth Internet access;
- Radio Fixed Access (RFA): the failure of Ionica has damaged investor perceptions of RFA. However, more advanced services are already available in some regions, and operators (such as Tele2) have aggressive roll-out plans. In July 1999 the Radiocommunications Agency allocated further spectrum for a new generation of broadband (up to 155 Mbit per second), RFA;
- Third Generation Mobile: which will offer broadband services through mobile handsets. The auction of spectrum necessary to offer these services is expected to take place in early 2000. The actual availability of such services is unlikely before 2002; and
- Interactive Digital TV: which has the potential to host interactive e-commerce services to a wide audience not necessarily familiar with computer technology. Cable has started offering these services already, other DTV interactive services begin this autumn.

9.37 Many of these technologies offer the possibility of an “always on” connection. Together with the changes described in paragraph 9.36 they will have significant implications for the way networks are used – dramatically affecting the development of e-commerce services. Of these technologies DSL is of particular interest, because it alone provides scope to provide high-bandwidth, “always on” access for residential and SME customers in the near future; whereas cable only passes 50% of homes and only 16%

take the service.<sup>1</sup> However, DSL needs to be implemented across the local loop where BT is dominant. This dominance creates barriers to the rapid roll out of competitively priced DSL. First because BT may be reluctant to move for fear of cannibalisation of its services – high-bandwidth access over the local loop could jeopardise its position in leased line and ISDN provision. Second, because BT could employ first mover advantage by rolling-out DSL technology alone – thus giving it a strong influence over the specific technology used, the pace and location of service introduction, and initial price levels. In other words, without some form of intervention, demand might be determined by BT – whose interests might not be perfectly aligned with consumers’, and the national interest.

9.38 However, there are risks connected with intervention. Distorted DSL investment decisions could result from intervention which prescribed the extent and speed of roll-out. Similarly, competing technologies could be adversely affected if roll-out decisions are not market-led. Some form of competition needs to be introduced into the technological upgrade of BT’s local loop to avoid these problems. This is being addressed by OFTEL, which has conducted a consultation process – “Access to Bandwidth”.

9.39 The “Access to Bandwidth” consultation examined options to “encourage the supply of higher bandwidth services to residential and SME consumers in the UK”.<sup>2</sup> Variants of two broad alternatives were considered. The first of these was local loop unbundling, in which BT “leases” local loop assets to rival suppliers who then perform the necessary upgrade to provide high bandwidth connections. The advantage of this option is the introduction of competition into the local loop, with associated beneficial price and quality implications. The disadvantages are the complexity of asset sharing both in terms of engineering standards and commercial agreements and the potential for delay and “game playing” (for example, appropriation tactics may be employed, such as obtaining the best location for new equipment on switch sites). The second option was an upgrade, carried out by BT, and then offered as a wholesale product to other operators and service providers; enabling them to provide high-bandwidth services to end users. The advantage of this option is the

<sup>1</sup> (Source: OFTEL)

<sup>2</sup> OFTEL: “Access to Bandwidth: Proposals for Action”, July 1999

probability of a rapid roll-out. The disadvantage is that BT gains first mover advantage and that it further entrenches BT's position – with the associated monopoly implications.

9.40 BT was in favour of the second option and presented plans to OFTEL for a roll out of DSL technology across the UK to commence in the near future. At this point in the process, however, OFTEL considers *“that competition in the upgrade of the network is an essential complement to this roll out by BT.”*<sup>3</sup> In other words that unbundling should proceed alongside any BT upgrade plans.

9.41 OFTEL's proposed timetable for local loop unbundling is demanding.. Considerable effort will be needed to agree engineering standards and commercial arrangements in this timescale:

- October 1999: final decision by OFTEL arising from Access to Bandwidth consultation.
- December 2000: latest date for initial local loop unbundling trial.
- July 2001: access to BT local loop by competing operators.

9.42 It is not the place of this report to pre-judge the outcome of the OFTEL “Access to Bandwidth” consultation process. The rapid roll out of high-bandwidth technology is clearly a prerequisite to a successful UK e-commerce sector and “Access to Bandwidth” is aimed at achieving that goal. PIU recommendations in this area are, therefore, more of a watching brief. The overarching recommendation is to remove barriers to the rapid roll out of high-bandwidth technology.

9.43 Specifically, it is necessary to ensure BT's DSL roll out plans do not give it unfair advantage. A delicate balance needs to be struck between rapid roll out and maintaining competition in broadband services. As discussed, BT can gain first mover advantages not only in terms of DSL technology and standards, but also in terms of enrolling the first wave of broadband customers. Responsibility for this lies with OFTEL and is required within their stated timetable.

9.44 In addition, the e-Minister (chapter fourteen), together with DTI, should ensure that OFTEL has sufficient resources to resolve the disputes and conflicts that will inevitably arise over asset sharing agreements between BT and other operators. These will involve major engineering and commercial issues and will be required to be settled quickly. OFTEL resources will be stretched to achieve this, as a major Price Control Review (see paragraph 9.31) will be taking place concurrently. OFTEL need to determine the precise level of the resources required to meet these concurrent commitments.

## ENSURE CO-ORDINATION OF INCLUSIVE ACCESS INITIATIVES

Recommendation 9.5: better co-ordination and marketing of access initiatives.

Recommendation 9.6 the monitoring of priority excluded groups.

Recommendation 9.7 the combination of skills training combined with provision of access.

9.45 E-commerce will cause significant transition in the economy. As has already been described, new goods and services will be developed. Existing goods and services may well be delivered more cheaply electronically. However, certain sections of the population may not benefit from these changes because they lack opportunities for access. The PIU approach is that, in general, the market will provide the appropriate level and cost of access for the great majority of the population. For example, Freeserve, Dixon's low cost Internet access provider, has dramatically increased Internet penetration rates within socio-economic groups CD and E. However, an element of the population is likely to remain excluded from the opportunities opened up by e-commerce for a range of social and economic reasons. Whilst a number of publically-funded initiatives, at local, regional and national level, aim to improve the opportunities for this 'e-excluded' group, the Team believes that better co-ordination of these initiatives is needed – with resources targeted at the most effective programmes – which must also be effectively marketed.

<sup>3</sup> ibid

9.46 To support the recommendations in this section, the following are briefly examined:

- target groups for inclusion;
- benefits and costs to inclusion;
- action taken on inclusive access; and
- recommendations to ensure the success of inclusive access initiatives.

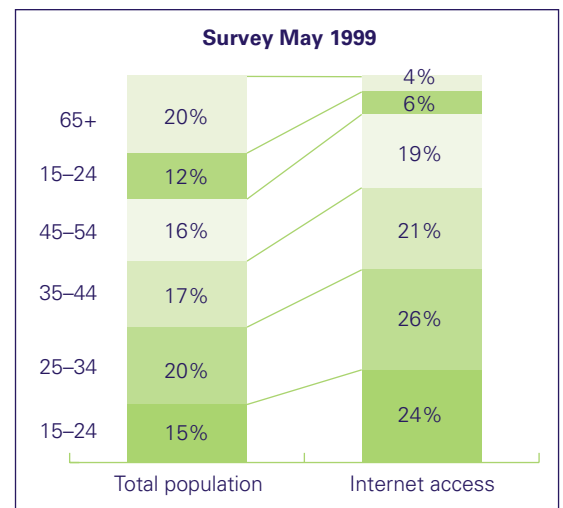
9.47 There are many factors that may contribute to individuals or groups being excluded from e-commerce in particular, and from information and communication technologies in general. Socio-demographic data highlight where some of these differences arise:<sup>4</sup>

- Gender – men tend to use the Internet more than women. Despite an (almost) even split in the population, more men than women use the Internet. Durlacher's Quarterly Internet Report (January 1999) showed that the male female split was 70%-30% for all Internet users and 81%-19% for heavy users. Yet in some areas of high unemployment caused by structural decline of traditional industries, the reverse is true – as a result of a cultural identification of work with computers as being unsuitable for men.
- Age – Internet penetration varies by age (see figure 9.5). The elderly are under-represented, relative to young people. This probably reflects the fact that most common routes to access are through employment and education – both of which are less readily available to older people.
- Social grade – according to Fletcher Research (May 1999) 45% of UK Internet users are AB although they only represent 22% of the population. (Durlacher's report quotes 50%) The cost of access, combined with skills and understanding are probably the main drivers of these social grade differences. On using IT "not relevant to my life", "Don't see a need for it" and "too difficult to understand" were cited by 10% of DEs and unemployed (BMRB -IT for All; October 1998). This "technophobia" by social grade is highlighted in the figure 9.6 which shows how PC penetration rates differ to those of VCRs for different occupations.
- Income – related to social grade, income is another strong indicator of internet penetration rates, with higher income

groups disproportionately represented (Fletcher *ibid*). Lower income groups also tend not to have credit card or indeed banking facilities, both of which are currently needed to transact electronically. Jupiter Communications research<sup>5</sup> although not specific to the UK, shows 42% of respondents with "non-existent" knowledge were in the lowest income bracket (earning <\$32k).

- Education – educational attainment is a key indicator. Although those who finished education after the age of 19 only represented 18% of Fletcher's sample they accounted for 48% of Internet users.
- Location – across the country the North and the Midlands are under-represented and the South is over-represented in e-commerce technology penetration (see figure 9.7). There are other locational differences which may result in exclusion such as rural as opposed to urban inhabitants.
- Ethnic origin – lack of skills in english literacy can be a barrier to some ethnic minority communities. However, some ethnic minority groups have disproportionately taken up use of the Internet – seeing it as a route out of poverty and exclusion<sup>6</sup>

UK INTERNET PENETRATION DECLINES WITH AGE



Source: Fletcher Research

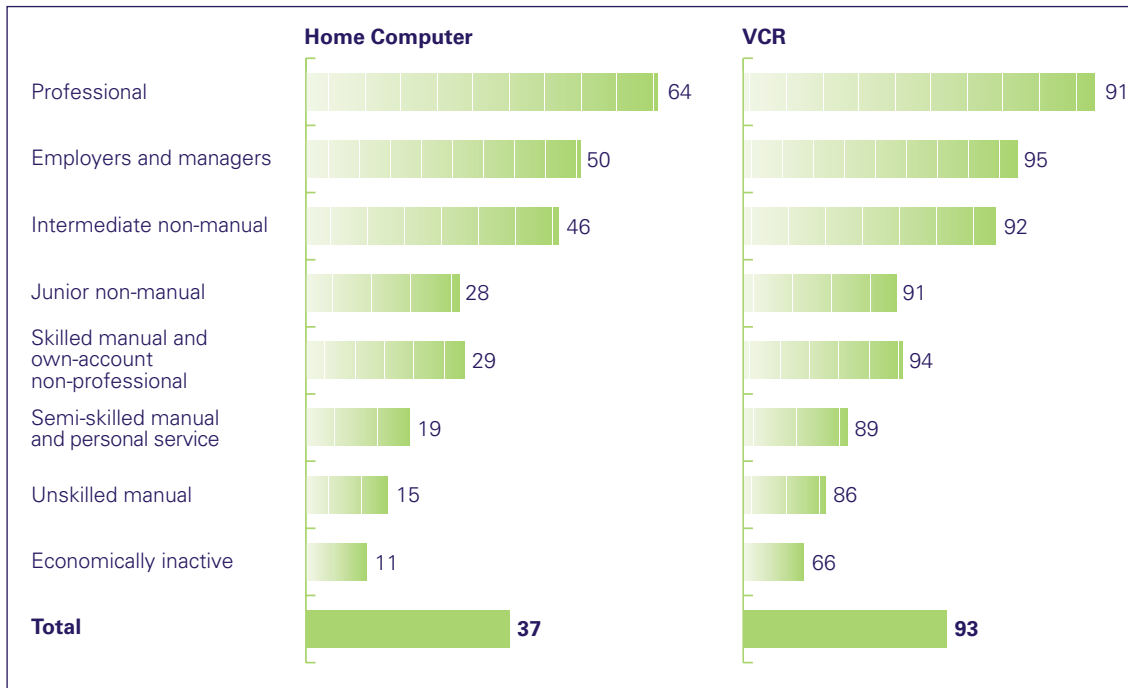
Figure 9.5

9.48 According to these statistics, those most likely to partake in e-commerce activities are young, wealthy, well educated and live in the south-east of England. It should be noted, of course, that the rapid rate of e-commerce

<sup>5</sup> European Internet Strategies, November 1998

<sup>6</sup> E-commerce Seminar 4 – Social Exclusion (see Appendix three)

OWNERSHIP BY ECONOMIC HEAD OF HOUSEHOLD, 1996 (%)



Source: CITU – Electronic Government

Figure 9.6

adoption means that these statistics are changing all the time.

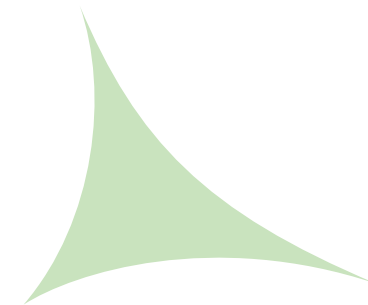
9.49 There are areas of exclusion other than those driven by socio-demographics. People with disabilities are one group, although there is little comprehensive information available about usage and e-commerce technology penetration rates amongst this group. This situation should be addressed, given the obvious economic and social advantages that e-commerce related technology can bring to such communities.

9.50 There are both costs and benefits associated with government intervention to promote more inclusive access. Benefits include those to the previously excluded – who potentially gain access to new e-commerce goods and services. As is described elsewhere in this report – these may be completely novel services, which depend on the information gathering, processing and distributing advantages of the Internet, or they could simply be standard products delivered more cheaply. In addition, access to the Internet can improve social cohesion and encourage communication, thereby reducing alienation. ICTs can also provide good access-points to adult learning for core skills such as numeracy and literacy. Government will also benefit from being able to deliver services more cost effectively to

welfare recipients. And, as has already been described, there are “network externalities” in e-commerce – the larger the network of users the greater the benefit to individual users.

9.51 However, there are costs to providing inclusive access, in terms of delivery and potential distortions. For instance, there may be significant costs associated with delivering broadband access to rural areas – where it will, for most technologies, be more expensive than to urban areas. And providing cheap or subsidised access may distort private sector behaviour, for example, by removing volume from operations which require a certain scale to operate. Clearly these costs and benefits need to be weighed up carefully when considering inclusive access initiatives.

9.52 There are a number of solutions that already exist to remedy the problem of inclusive access. Some of these have been provided by the market, some by Government, some by the voluntary sector. The example of “free” ISPs as a market-driven solution has already been discussed (see quote below). Internet cafes and even multi-media kiosks in photo-booths are further examples in the UK of how the private sector are reaching out to engage the general population in e-commerce. Initially in the US,



## PENETRATION OF E-COMMERCE IN COMPANIES, BY UK REGION



and now in the UK, companies are beginning to offer “free PCs” which are paid for by advertising. When interactive digital TV begins full operation later this year in the UK, it is expected that further new groups will be given the opportunity to access certain e-commerce goods and services.

“The free service providers are attracting a new type of Internet user – generally older and from C2DE social groups – where previously, users had been from predominantly younger age groups and ABC1”

Source: NOP, 12/98

9.53 Leading examples of Government initiatives to promote access are shown in box 9.3. In addition, application of the Disabilities Discrimination Act (1995) should ensure that providers of access technologies such as PCs and software, or access centres, take into consideration the needs of the less able community. Local government and the voluntary sector are also promoting Internet access through a variety of initiatives.

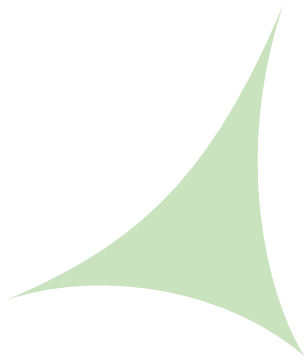
9.54 There are benefits to society from an inclusive approach to e-commerce access, and despite the variety of access initiatives described above, there appears to be little

overarching control. A lack of central co-ordination is evident. One of the policy action teams set up to implement the agenda as a result of the Social Exclusion Unit’s report on “Bringing Britain Together” is addressing the problem in one important respect through initiatives aimed at tackling social exclusion in deprived areas. But the Team believes that this approach needs to be applied in the broader context of all the potentially ‘e-excluded’ groups listed at paragraph 9.47. The Team therefore recommends that the e-Minister facilitates better co-ordination of the numerous central and initiatives promoting access. The inter-Ministerial group (see box 9.3) will be the key vehicle for this action. In particular, mechanisms are needed to ensure that:

- the overall goals of Government’s e-commerce programme are being met;
- all excluded groups are catered for appropriately;
- resources are allocated to the best performing initiatives. These should be sufficient to cover not only access infrastructure, but also what is needed to provide continuing support for that infrastructure once in place – in terms of hardware, software and people. And effective marketing of these initiatives

#### EXAMPLES OF GOVERNMENT INITIATIVES TO PROMOTE INCLUSIVE ACCESS

Access Initiative	Description	Lead Department
<i>Infrastructure</i>		
IT For All	National network access centres in local communities set out in “Our Information Age” by the PM, May 1998	DTI
IT Learning Centres	Budget 1999 announced support for up to 1,000 learning centres. These will focus on reaching out to people who are neither engaged in ICT or other learning, and who also face significant obstacles in becoming so. There will also be opportunities for start-up SMEs to acquire certain ICT skills.	DfEE, Treasury
New Library Network	Provision of broadband access in 4,000 UK libraries	DCMS
<i>Analysis and monitoring</i>		
Inter-Ministerial Group	Resolution of potential overlap areas between access initiatives.	DTI, HMT, DfEE, DCMS
PAT 15 – Social Exclusion Unit (SEU)	Under the auspices of the SEU, PAT 15 is charged with examining the provision of ICT in deprived areas.	DTI
Universal Service Obligation consultation	OFTEL have issued a consultation document on the costs and benefits of universal service in telecommunications	OFTEL



within the context of the overall marketing strategy proposed in recommendation 8.1;

- access initiatives are not distorting market mechanisms; and
- responsibility for co-ordination should lie with the e-Minister and e-envoy.

9.55 As shown in the statistics above (paragraph 9.47), certain groups seem especially prone to e-exclusion. The elderly, less well educated and lower socio-economic grades in particular. These groups should be both targeted by access initiatives and closely monitored to ensure the efficacy of programmes. In addition, survey data should be sought which provides better information on Internet penetration for all potentially excluded groups such as less able users and rural users. The responsibility for monitoring performance should again lie with the e-Minister and e-envoy (chapter fourteen). The results of the survey should be published as part of the annual e-commerce report (detailed in chapter eight) and should be timed accordingly.

9.56 Lack of understanding and confidence with technology in excluded groups are both apparent as problems from survey evidence. As well as providing pure access, training should be incorporated into the access initiatives to overcome these barriers.

## 10. TRUST

### SUMMARY

10.1 Having achieved understanding and access to tools, users must be willing to engage in e-commerce. This chapter deals with the significance of trust as a barrier to that willingness, and what can be done to overcome it. What is meant by trust in e-commerce is defined and the main component issues are identified. These issues are: fear of fraud; concerns about privacy; anxiety about content; doubt about legal liability and; worry about how redress can be obtained when things go wrong.

10.2 The chapter suggests how the component issues can be addressed through a number of recommendations for Government and industry action. The PIU Team identified three overarching areas in which action needs to be taken: implement standards, supported by effective enforcement and provide appropriate education. The nine recommendations for Government action in this chapter therefore fall into these three categories.

#### ● Implement Standards

- Recommendation 10.1: implement a national, secure Public Key Infrastructure (PKI) for Government purposes.
- Recommendation 10.2: ensure that the industry-led Trust UK Hallmark initiative puts in place an Internet dispute arbitration service and a mechanism for policing its standards.
- Recommendation 10.3: encourage private providers to launch multi-function smartcard schemes for individuals.

#### ● Effective Enforcement

- Recommendation 10.4: ensure Government departments quickly take advantage of the equivalence between digital and written documents.
- Recommendation 10.5: improve technical capability of law-enforcement and regulators and establish an Internet Crime Unit.
- Recommendation 10.6: build on the recommendations in the PIU report: 'Encryption and Law Enforcement' on Government/industry co-operation.
- Recommendation 10.7: the Home Office should re-consider the case for using non-jury trials for serious fraud (including e-commerce fraud).
- Recommendation 10.8: the Government to encourage the EU to achieve a co-regulatory approach to e-commerce enforcement and redress.

#### ● Appropriate Education

- Recommendation 10.9: ensure action is taken to give protection of Intellectual Property Rights (IPR) a higher profile in public understanding and that DCMS work with the creative industries to put in place standards and infrastructure to ensure that content is protected in transmission and that adequate remuneration is received for the exploitation of intellectual property.

- Recommendation 10.10: provide “parents’ Web sites” and encourage software companies to supply free content-filtering software.

10.3 It is also acknowledged that market-led initiatives have a crucial role to play in the development of trust.

## BACKGROUND AND DEFINITIONS

10.4 There is no agreed, simple definition of trust in the e-commerce context. This report therefore defines trust as ‘the confidence to use e-commerce without fear of material loss or harm through interference with your rights as an individual or a business’.

“Consumers new to e-commerce sense a kind of chaos in the Web, where information is vulnerable to hackers, technology is unreliable, and good intentions may lead to unpredictable results.”

E-Commerce Trust Study.

Cheskin Research and Studio Archetype/Sapient.  
January 1999.

10.5 A general survey of UK consumers in May 1999<sup>1</sup> showed that only 7% felt secure in submitting credit card details over the Internet. In the EU generally Visa found in 1999 that only 5% of consumers trusted e-commerce. Businesses too have significant concerns about Internet security. A January 1999<sup>2</sup> survey of 50 EU executives found that 90% of them considered trust to be a critical issue for e-commerce. Lack of trust is therefore an obvious and significant barrier to e-commerce for both consumers and businesses.

10.6 The Team has identified five major issues that lead to lack of confidence. The first of these is the fear of fraud. The second is concern that privacy will be violated – through the loss of control over personal data. Third, there are worries about the content of the Internet. Fourth, are concerns about who has liability. And fifth there are anxieties about obtaining redress in the case of disputes. These issues are explored further below.

10.7 There are as many types of Internet fraud as there are types of ‘scam’ in the ‘real world’. And new scams inevitably arise from the nature of the medium itself and particularly from the anonymity it can afford (see box 10.1). The problem is growing as the Internet is used increasingly for e-commerce. In 1997 the number of instances of fraud reported to the US National Consumers League (NCL) was 1,280; in 1998 it was 7,750 – a rise of more than 600%. The NCL estimates that about 7% of on-line consumers in the US have been the victims of credit-card fraud on the Internet.<sup>3</sup> In 1998, the UK the Internet Watch Foundation (IWF)<sup>4</sup> had only one reported case of a financial scam on the Internet. However, in a recent report<sup>5</sup> the UK’s National Criminal Intelligence Service (NCIS) assessed that Internet fraud is an emerging threat in the UK that will increase significantly in the coming years. There is no doubt that bad publicity surrounding successful Internet scams contributes significantly to poor confidence in the use of the Internet as a trading medium. Because of the generalised nature of the threat, fraud is of concern to both consumers and to those engaged in e-business. A prime requirement is to build confidence in the means of authenticating any data and each party involved in an electronic transaction.

### ‘SPOOFING’ ON THE INTERNET

By use of some clever software linked to a Web page it is possible for an attacker to persuade a victim’s Internet browser to connect to a fake server that ‘spoofs’ the appearance of a secure site (such as a bank). The victim’s browser will present him with usual appearance of a ‘secure’ session. As a result, the user may be persuaded to reveal information such as credit card numbers, PINs, insurance or bank details, or other private information to the fake server.

Source: Rainbow Diamond Internet Security

Box 10.1

10.8 For the purposes of this report, privacy is defined as the mechanism by which e-commerce users ensure that they retain control over their own data. General consumer concerns about privacy in the UK

<sup>1</sup> Gallop Survey for De La Rue

<sup>2</sup> Forrester report “Braving EU Net Regulation”

<sup>3</sup> Survey by Louis Harris & Associates for NCL. April-May 1999

<sup>4</sup> Internet Watch Foundation, statistics for 1998

<sup>5</sup> Project Trawler: Crime on the Information Highways. A major report from the UK National Criminal Intelligence Unit. Published June 1999

were expressed in the results of a survey conducted by the Consumers' Association in 1999. These are shown in figure 10.1. Businesses too are concerned about privacy issues. A survey of EU executives<sup>6</sup> showed that 80% of them believed that privacy is a critical issue for e-commerce.

10.9 There are a number of problems underlying the concerns involving privacy for both businesses and consumers. These essentially concern the use of junk e-mail ('spam') and 'hacking', which are examined below.

SPAM

10.10 The sending of unsolicited 'junk' e-mail ('spam'), by businesses that have obtained personal details of consumers without their knowledge is a significant problem. 'Spam' is quite distinct from conventional junk mail or junk fax – in that, unlike these, the recipient has to pay for it. This is a result of the cost incurred through being connected to a service provider while the junk e-mail is downloaded. A survey of Internet users in the USA, conducted in November 1998<sup>7</sup> showed that at least 80% of consumers are very concerned about material identifying them personally being shared between businesses without their knowledge 'Spam' has yet to become a serious problem in the UK although concerns about it are growing (see box 10.2).

ATTITUDES TO SPAM IN THE UK

The PIU e-commerce Team carried out an analysis of 208 public responses to the DTI consultation document on the Electronic Communications Bill. Only 30% (62) of respondents commented on 'spamming'. Of that 30%, 40% (25) were in favour of legislation or regulation and 53% (33) were against, 6% (4) were unclear.

Some Comments:

*"spam causes annoyance to users, and can slow down the service provided... service operators operate less effectively...resulting in higher charges."*

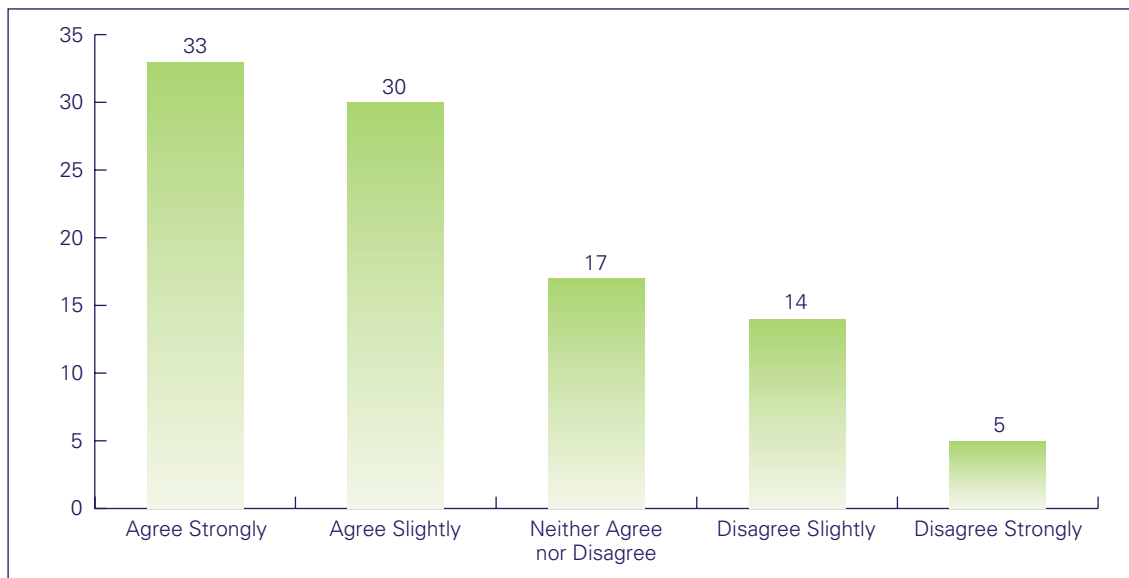
*"these unsolicited messages are irritating but, more importantly, they incur direct and indirect costs for the recipients."*

*"spamming is a significant problem that causes customer annoyance, unnecessary traffic and dilution of messages that customers care about."*

Box 10.2

10.11 Business concerns about 'spam' centre around the need to balance consumer pressure to limit junk e-mail against a legitimate requirement to seek new consumers through the use of e-marketing techniques. Spam can also be used to 'swamp' a Web site – denying service to potential customers (see box 10.3). Such tactics can have a military as well as a commercial application – the Serbs used this method against the NATO Web site during recent NATO operations in Kosovo. Speaking

"I AM WORRIED ABOUT HOW MY PERSONAL INFORMATION TRAVELLING OVER NEW TECHNOLOGIES MIGHT BE USED"



Source: Consumers' Association/IPSOS-RSL. May 1999

Figure 10.1

<sup>7</sup> AT&T Labs – Research Technical Report. TR99 4 3 14 April 1999.



of the negotiations between the US and the EU over the issue of privacy legislation, David Aaron, the US emissary, said: "Blockage of data could threaten billions if not trillions of dollars-or euros-in international trade and investment".

#### HACKING

10.12 'Hacking' is the process of gaining unauthorised access to a system and thus to data. 'Hackers' tend to maintain that they are crusaders – performing a public good by exposing security flaws or by revealing concealed information, which they believe, should be openly available. 'Crackers', are the dark side of 'hackers'. They break into system to either to steal data or to interfere with the system in some way that will cause damage. Hacking, or cracking, can, and does, cause serious problems – as when a virus is infiltrated onto the Internet (the 'Melissa' and 'Explore.zip viruses are recent examples). Hacking can be used as a form of terrorism, as a way of stealing money, as way of 'stalking' a victim or it can cause severe disruption to the infrastructure. All these are illustrated in box 10.3.

#### CONTENT

10.13 Internet users are concerned about protecting children and vulnerable people from illegal or immoral material. A May 1999 survey of US parents showed that 78% have concerns about the content of Internet material to which their children have access.<sup>8</sup> In the UK the IWF handled 2,407 reported cases of illegal content in 1998, compared with 898 in 1997 (see figure 10.2). Control of content for consumers is thus a serious, and growing issue and a problem that must be solved.

10.14 Businesses, unlike individuals, are more concerned about defending their Intellectual Property Rights (IPR) to the content of Internet Web sites. These concerns are based on the undeniable fact that the Internet is an excellent means of transferring intellectual property such as music, video or the printed word. An example of current concerns in music publishing is contained in box 10.4. Fear of loss of intellectual property is thus a real and growing problem that militates against the use of the Internet by businesses and the question to be addressed

#### HACKING DAMAGE

In the early 1980s:

- members of a hacking ring in Milwaukee were accused of 60 computer break-ins ranging from the Memorial Sloan-Kettering Cancer Center to Los Alamos National Laboratory.

In the late 1980s:

- Kevin Mitnick was convicted of damaging computers belonging to MCI and Digital Equipment and stealing software.
- The First National Bank of Chicago was victim of a \$70-million computer heist perpetrated by a hacker.

In the early 1990s:

- hackers caused the AT&T long-distance service to crash.
- The first UK hacker to be caught, a 16-year-old teenager, was accused of hacking into the Pentagon.
- A Texas A&M professor received death threats after a hacker logged on to his computer from off-campus and sent 20,000 racist e-mail messages using his Internet address.

In the late 1990s

- A Canadian hacker group called the Brotherhood, angry at hackers being falsely accused of electronically stalking a Canadian family, broke into the Canadian Broadcasting Corporation's Web site and left a message: "The media are liars." The family's own 15-year-old son was eventually identified as the stalking culprit.
- Popular Internet search engine Yahoo! was hit by hackers claiming that a "logic bomb" would go off in the PCs of Yahoo!'s users on Christmas Day 1997 unless Kevin Mitnick was released from prison.

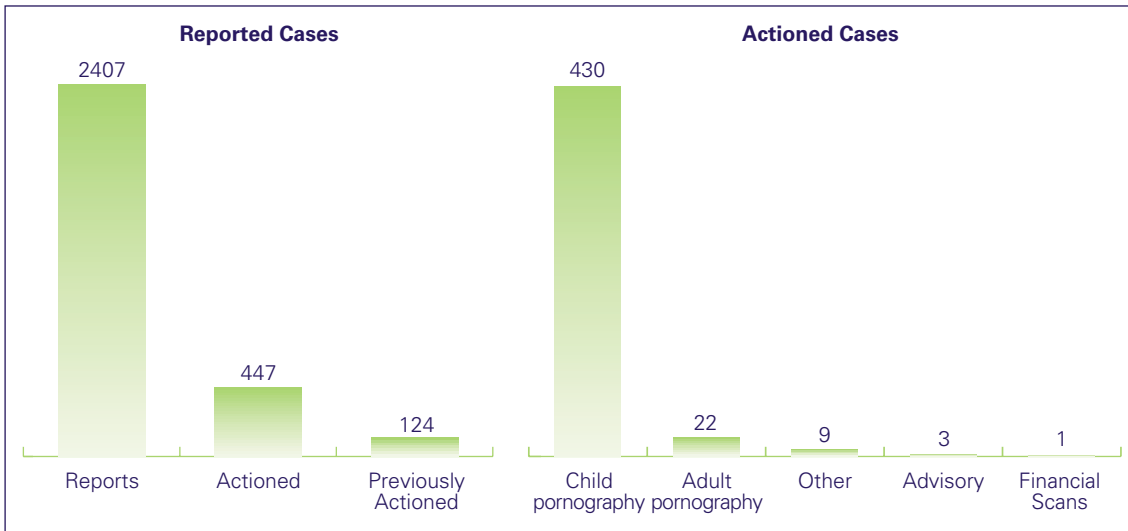
In 1998:

- The US Federal Bureau of Labor Statistics was 'spammed' for days with hundreds of thousands of fake information requests.
- Hackers claimed to have broken into a Pentagon network and stolen software for a military satellite system, which they threatened to sell to terrorists.

Source: *St. Petersburg Times*. 1998

Box 10.3

<sup>8</sup> Roper Starch Worldwide Survey



Source: <http://www.iwf.org.uk/stats/stats.html>

Figure 10.2

**THE CHALLENGE OF MP3**

The most controversial topic in the music publishing industry at present is the use of MP3. This is a piece of software available over the Internet that compresses standard audio tracks into much smaller sizes without significantly compromising sound quality. Use of MP3 enables whole CDs to be transmitted over the Internet in minutes. Some companies are now selling equipment that enables users to download music in MP3 format from the Internet directly into a personal stereo system. This has huge potential implications for the music industry, which is one of the UK's strengths.

- As an indication of the interest in MP3, it is consistently in the top ten of search terms used in Internet search engines!

Box 10.4

by the recommendations is: "will my IPR be challenged if I put my intellectual property on the Internet?"

**LIABILITY**

10.15 Both consumers and businesses are concerned about matters of liability. Research<sup>9</sup> shows that consumers are concerned about fulfilment of orders. Businesses "need to have a basic legal framework to enforce contracts."<sup>10</sup>

10.16 Internet Service Providers (ISPs) have particular concerns over the matter of liability for content. A current case involving an ISP, which has reached court, is highlighted in the box 10.5. The outcome of this case has led to public declarations by ISPs that being made liable in such cases will have a seriously deleterious effect on their function.

**REDRESS**

10.17 In March 1999 Visa International reported finding that Internet transactions generate 50% of credit card disputes, despite the fact that such transactions account for only 2% of Visa's overall business.<sup>11</sup> Most common disputes centre on charges for unordered goods, late delivery and additional charges. Such a finding highlights the necessity to ensure that some form of redress is available in connection with e-commerce transactions. In the UK the small claims court is a simple, tried and tested method for resolving disputes. However, it is not suitable for very low value transactions. Moreover obtaining legal redress in cross-border cases can be extremely hard for individual consumers.

10.18 The EU has therefore suggested that development of the single market in financial services in the EU, spurred by the development of e-commerce, should

<sup>9</sup> E-Commerce Trust Study. Cheskin Research and Studio Archetype/Sapient. January 1999

<sup>10</sup> Financial Times. 23/06/1999

<sup>11</sup> Second Roundtable on E-Commerce in Asia

### THE CASE OF GODFREY V DEMON INTERNET

Laurence Godfrey, a physics, mathematics and computer science lecturer, served a writ on Demon Internet regarding an allegedly forged message posted on a Demon-hosted newsgroup in January 1997. Demon was informed about the defamatory message, but failed to remove it from its servers.

A High Court judge in London made a preliminary ruling in March 1999 that Demon cannot claim that it bears no responsibility for material held on its servers.

Despite their stated intention at the time of the ruling, Demon have failed to appeal – and can therefore now be taken to court for carrying defamatory content on its servers.

“...it is important to engage in debate about ... the question of who has liability for content being distributed over the Internet. By default, some ISPs could be considered to be publishers.”

“...ISPs are sued regularly for matters over which they have no control. Nearly all these cases are settled out of court to avoid adverse publicity. As a result the matter receives very little public attention and leaves the liability issue unresolved.”

*Participants at PIU E-Commerce Seminar*

Box 10.5

be supported by the development of cross-border redress mechanisms for EU consumers. All EU consumers would have access to the UK financial ombudsman scheme if they felt that they were the victims of mis-selling or other problems as a result of purchasing a financial product from a UK supplier. And UK consumers would similarly have access to the redress mechanisms in another member state, if they had concerns about a financial product bought in that state. Access to redress of this nature is likely to be a key aspect of building consumer confidence in cross-border e-commerce, at

least for complex and/or high-value purchases.

## TRUST ISSUES

10.19 Underlying the five issues discussed above are a number of questions, which are detailed in box 10.6. figure 10.3 shows the eleven recommendations in this chapter tabulated against the five issues described above. The table shows how recommendations address the issues by describing briefly how the questions posed in box 10.6 are answered.

### TRUST ISSUES

#### Fraud

- For Consumers:
  - Is the seller authentic?
  - Will credit transfers be secure?
- For Businesses:
  - Is the buyer genuine?
  - Is the credit transfer genuine?

#### Privacy

- For Consumers:
  - Can I be protected from ‘spam’ (junk e-mail)?
- For Businesses:
  - Can I use information gathered from the Internet, for marketing purposes?
- For Both:
  - Can I protect my information against ‘hacking’?

#### Content

- For Consumers:
  - Can I control access to illegal/immoral material?
- For Businesses:
  - Will my IPR to the content of my Web site be infringed?

#### Liability

- For Businesses:
  - Can liability for Internet content be clearly determined?
- For Businesses and Consumers:
  - Can the contract I am entering into be enforced?

#### Redress

- For Businesses and Consumers:
  - Is there a clear means of resolving disputes about e-commerce transactions?

Box 10.6

MAIN ISSUES ADDRESSED

Recommendations	FRAUD		PRIVACY			CONTENT		LIABILITY		REDRESS
	Consumer	Business	Consumer	Business	Consumer +Business	Consumer	Business	Business	Consumer +Business	Consumer +Business
10.1: PKI Standard	Authenticates seller. Secures credit transfer	Authenticates buyer. Secures credit transfer							Authenticates contracts.	Helps resolve disputes
10.2: 'TrustUK' Hallmark	Authenticates seller. Helps secure credit transfer		Helps protect against spam	Clarifies use of data		Gives assurance about content			Clarifies contracts	Provides clear dispute resolution
10.3: Smartcards		Authenticates buyer. Secures credit transfer			Helps protect from hacking		Helps protect copyright		Authenticates contracts	Helps resolve disputes
10.4: Digital/written Equivalence	Helps authenticate seller	Helps authenticate buyer							Helps authenticate contracts.	Helps resolve disputes
10.5: Internet Crime Unit	Helps authentic sellers. Helps secure credit transfer	Helps authentic buyers. Helps secure credit transfer	Helps protect against spammers		Helps protect against hackers	Helps protect against illegal content				
10.6: Encryption & Law Enforcement	Helps secure credit transfer				Helps protect against hackers		Helps protect against IPR piracy			
10.7: Internet Tribunals	Help authentic sellers. Helps secure credit transfer	Help authentic buyers. Helps secure credit transfer						Help resolve content liability issues		
10.8: EU Cross-border enforcement	Helps secure credit transfer	Helps secure credit transfer					Helps protect against IPR piracy	Help resolve content liability		Helps resolve disputes
10.9: IPR Education							Helps protect IPR			
10.10: Parents' Web sites						Help protect against illegal/immoral content				
Infomediaries	Help authentic sellers		Help protect against spam	Clarify use of data		Help protect against illegal/immoral content			Help authenticate contracts	Help to resolve disputes

Figure 10.3

## RECOMMENDATIONS AND ANALYSIS

### IMPLEMENT STANDARDS

Recommendation 10.1: implement a national, secure Public Key Infrastructure (PKI) for Government purposes.

10.20 E-commerce raises problems of identifying and authenticating remote trading partners, and ensuring that credit transfers are secure, with data protected from interference. Any solutions to these problems have to inter-operate smoothly with trading partners around the world, and support an agreed set of services. In e-commerce the relevant services are:

- Integrity – to ensure that data has not been accidentally or deliberately corrupted;
- Authentication – to ensure that the originator or recipient of material is the person they claim to be; and
- Confidentiality – to ensure that data cannot be read by anyone other than the intended recipients.

In an electronic environment, the recognised means of providing these three services is through the use of cryptography.

10.21 The form of cryptography best suited to e-commerce is 'Public Key Cryptography' (PKC) (see box 10.7). In order to exchange PKC messages, users need an agreed way of linking up to each other, and this is provided by what is called a Public Key Infrastructure (PKI).

10.22 The use of PKC will address the problems posed under 'fraud' because it:

- enables data to be sent securely, without being corrupted;
- allows both the sender and recipient to be positively identified;
- goes some way to guard against hacking by permitting the integrity of data to be tested;
- assists in determining liability by ensuring that the parties to a contract can be confidently identified; and
- can help in the resolution of disputes.

10.23 Worldwide there are many companies offering PKI technology. And the Alliance for Electronic Business (AEB), in co-operation with partners in Europe, has established a project to create standards for the effective realisation of a trust-services infrastructure – EMERITUS (see box 10.8). To bring PKI into a wide use requires a partnership between a company offering the technology and a company with the infrastructure to provide the certification services. Such a company must be able to validate the identity of those using the system and be prepared to act as an intermediary (or 'trusted service provider'). In the UK there are now two major private-sector trusted service provider initiatives of this kind – BT's 'Trustwise', initially launched in July 1998 and 'Viacode' launched by the Post Office in March 1999. In addition, Identrus (formerly the Global Trust Organisation), a venture involving eight major banks world wide, is due to be implemented in the second quarter of 2000 (see box 10.9).

10.24 Government has been developing an open PKI standard, under a programme called CLOUD COVER. This programme aims to ensure that Government departments have access to the widest possible range of secure, interoperable and cost effective PKI

#### PUBLIC KEY CRYPTOGRAPHY

In this system, users' keys come in pairs, known as public and private keys. As the names suggest, private keys are known only to their owners, whereas public keys are available to anyone. A private key cannot be derived from the corresponding public key. Messages can be enciphered using the intended recipient's public key. The private key needed to decipher the message is known only to the recipient. Therefore, only the recipient can decipher the message content. It is obviously important for the sender of the message not only to be able to gain access to the recipient's public key but to be confident that it does indeed pertain to the correct and intended recipient. Public keys are very often made accessible to all; they are bound to the identity of their individual owner by 'wrapping' them in a digital certificate, signed by a recognised and trusted certification authority (CA).

*Source: PIU Report 'Encryption & Law Enforcement' May 1999*

*Box 10.7*

#### THE EMERITUS PROJECT:

The E-business Model for the Effective realisation of a TrUst Services infrastructure (EMERITUS) is UK led. Driven by the Alliance for Electronic Business on a not-for-profit basis, the project enjoys the collaboration of partners in Belgium and Spain and support from the European Commission's TEN-Telecom programme. The EMERITUS initiative establishes a voluntary policy framework implemented through an industry-led Global Trust Services Federation and an industry led Trust Services Association in each nation.

EMERITUS will allow trust service providers to compete aggressively for business in accordance with the seven policy principles:

1. Industry must build a global Trust Services Infrastructure (TSI) that actively encourages innovation and the development of electronic business.
2. Industry must build a global TSI that does not, as an objective or in implementation, restrict in any way the development of new ways of conducting electronic business, or of providing privacy and trust.
3. Industry must build a global TSI that appears to the subscriber as an integrated, seamless whole.
4. Industry must, working with governments, build a global TSI that conforms everywhere to international trade principles and, in Europe, to community law.
5. Industry must, working with governments, build a global TSI that does not threaten the sovereignty, security or economic well-being of any nation.
6. Industry must acknowledge that problems are perceived by governments, must be proactive in the search for solutions and must drive the development of relevant new technologies.
7. Industry in Europe must be among the first to address the policy principles, because the European case is the most difficult to solve.

Source: AEB

Box 10.8

solutions. Amongst the ways it is achieving this is through the encouragement of PKI vendors to get their products assessed by the Government's Communications-Electronics Security Group (CESG) and through the provision of an HMG 'root authority' to link departmental PKIs and to allow interoperability with commercial Trusted Service Providers (TSPs) and other national PKIs. Within Government, an interdepartmental PKI working group has been tracking developments and defining the broad business case for a Government PKI. Progress towards the establishment of a Government-wide infrastructure would be accelerated if there existed a central high-

level sponsor; and this must be addressed. It is recommended that the activity of the PKI working group be broadened to include the AEB and other industry partners, to put final touches to the standard and bring about an early Government implementation (for instance for procurement), such as would seed national take-up of the PKI standard. Co-ordination of this activity should be the responsibility of the new e-Minister. The target should be to have to a standard in use by 31 March 2000.

10.25 Successful implementation of a common PKI standard for Government procurement could mean that as much as

#### TRUSTED SERVICE PROVIDER PKI INITIATIVES:

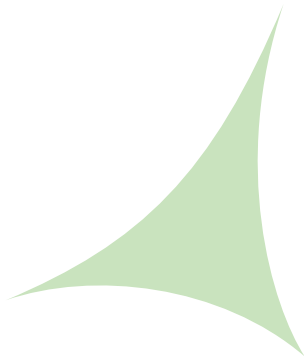
- Viacode offers a full PKI service involving certification and authentication as well as encryption software, it works to EMERITUS standards. The technology used is supplied by Entrust. To ensure that identification is certain, users must identify themselves in person using three types of document, one of which must include a photograph.

Source: PIU Interview with Director Royal Mail Electronic Services. 31/03/1999.

- Identrus is an alliance of: ABN AMRO; Bank of America; Bankers Trust; Barclays; Chase; Citibank; Deutsche Bank; Hypo Vereinsbank. The infrastructure is designed as a non-proprietary network using open standards. It will provide authentication, integrity, non-repudiation and confidentiality. Any bank may participate in the enterprise and will act as a 'trusted third party' for businesses and consumers.

Source: PIU Interview with Identrus Director, Participant Relations. 24/03/1999

Box 10.9



£29bn is spent annually (see chapter eleven) through a standard, secure e-commerce system. In view of the size of the spend, and the number of businesses that will be affected, such a move will act as a significant driver to the development of a critical mass of UK businesses involved in e-commerce (see chapter eleven). Furthermore, it is likely that the Government PKI standard will become the *de-facto* UK standard.

Recommendation 10.2: ensure that the industry-led TrustUK Hallmark initiative puts in place an Internet dispute arbitration service and a mechanism for policing its standard.

10.26 Potential users of Internet sites for e-commerce have no way of checking that the Web site owner is genuine and has a good track-record of honesty and security. Addressing this problem will to a large extent be a task for market players themselves. On-line retailers need to make customers feel secure about using on-line payment methods and confident that goods and services purchased on line will be delivered and will meet their expectations. The rapid development of new trusted brands like Amazon.com, and the extension onto the Internet of trusted brands such as Virgin and Barclays, show this happening in practice.

10.27 The use of hallmarks (such as the hallmark on a piece of silver) is a way of engendering trust in both consumers and businesses, particularly smaller businesses, which do not have the advantages of well-known brands. They can provide a guarantee that certain standards have been met. In autumn 1998 the Information Age Partnership recommended to Government that it take action to introduce a hallmark for e-commerce Web sites. In response the Competitiveness White Paper included a commitment to work with industry to develop an on-line digital hallmark to identify best-practice Web sites. The concept was also strongly endorsed during the PIU Team's workshops and seminars, where businesses and consumer groups stressed the need for an e-commerce hallmark that must be:

- backed by clearly defined standards;
- well-regulated and policed;
- which businesses will use; and
- in which consumers will have confidence.

"What is needed is a mark that will be internationally recognised as trustworthy."

"There is a need to establish a single system that will be instantly recognisable, like the BSI 'kite-mark'."

*PIU Seminar Participants*

10.28 The idea of a hallmark for Web sites is not new. The Verisign mark is widely in use, particularly in the USA. This has a technological underpinning, and is intended primarily to address matters of privacy and data protection. Other US examples of include: Digisign, Cybertrust, Entrust, TrustE and P3P (Privacy Preferences Project). A number of commercial and trade trust-marks are being developed in the UK. That of the Direct Marketing Association (DMA) has now been subsumed into the DTI's TrustUK proposal. There is also a scheme by the Consumers' Association, which began operation on 24 June 1999 (box 10.10). The Institute of Chartered Accountants and the British Chambers of Commerce also have schemes that are shortly to become operational. The Advertising Standards Authority has also proposed its own hallmark.

#### THE CONSUMERS' ASSOCIATION (CA) HALLMARK:

The CA 'Which? Web Trader' scheme is an online branding scheme to boost consumer confidence in e-commerce. Online traders wishing to display the Which? Web Trader logo have to agree to a stringent code of practice governing pricing, advertising and delivery of their goods. Applications are vetted by the CA's lawyers. Traders must: display total prices (including delivery) prominently; agree a delivery date with consumers and offer a refund if this is not met; offer security for personal data, and; clearly label all third party advertising. The scheme, which is free, will be rigorously policed by the CA and traders failing to obey the code of practice will be removed and publicly humiliated!

*Source: Silicon.com*

*Box 10.10*

10.29 DTI has been working with the Alliance for Electronic Business to implement the Competitiveness White Paper commitment, bringing these existing and planned initiatives within a single framework. The results of this work were reported in the recent White Paper 'Modern Markets:

Confident Consumers', which announced the creation of a new, industry-led body – TrustUK. This body will ensure that e-commerce hallmarks meet a consistent standard, those that do so will be identified by the TrustUK branding. The presence of a TrustUK hallmark on a Web site will offer users the re-assurance that they are dealing with an authentic, trustworthy trader who will respect the consumer's privacy, follows good information security practices, will not display any illegal or immoral content and will have a clear policy concerning its contracts and dispute resolution.

10.30 To be effective TrustUK must be backed by a mechanism to police the standards it sets. It is not clear whether the Office of Fair Trading, which the Government proposes should oversee other industry codes of practice, will have a role in relation to those elements in e-commerce codes which are in fact common to all good codes, such as effective redress systems. The organisations responsible for individual codes, and the firms that are bound by them, need to know who will be responsible and that there will be no duplication of enforcement work.

10.31 The Team therefore recommends that:

- DTI ensures that TrustUK puts in place clear mechanisms to police its standards; and
- TrustUK establishes an Internet disputes arbitration service allowing both consumers and businesses fast-track access to arbitration for any dispute arising from an e-commerce transaction with a trader bearing a TrustUK hallmark.

Recommendation 10.3: encourage private providers to launch multi-function smartcard schemes for individuals.

10.32 Individual users of e-commerce have problems in identifying and authenticating themselves over the Internet. There is also a problem for those without credit cards, or those who see these as too vulnerable, in paying for e-commerce transactions. One possible solution to these problems is smartcards (also known as 'Chip cards' or 'Integrated Circuit Cards'). These are essentially a computer chip on a plastic card like a credit card.<sup>12</sup> (See box 10.11 for more details.) The most familiar use of a smartcard is in the mobile phone, where the

'SIM' card is, in fact, a form of smartcard. The advantages of a smartcard over a traditional credit card, which contains a magnetic stripe, is that they can contain far more data, and can therefore be used to store many more personal details (even, perhaps, a digitised photograph). They are also able to support the kinds of processing needed to secure transactions. Their greater capacity also means that they can contain many more security measures than a magnetic stripe card. See box 10.12 for more details of their use. The 'Modernising Government' White Paper committed the Government to publishing a framework for the use of smartcards in support of service delivery across Government. This recommendation proposes that the introduction of such multi-functional smartcards should take place as quickly as possible.

#### TECHNOLOGY OF SMARTCARDS

Smartcards can be either 'contact' or 'contactless'. As the names imply, in the former case physical contact has to be made between the card and the 'fixed' system with which it is interacting. In the latter case the card does not have to come into contact with the fixed system. In contact cards, power is transferred to it from the fixed system. Contactless cards can either contain their own battery or, more frequently, be supplied with energy through an 'inductive loop'. In both types of card data can either be read from the card or written onto the card or both, depending on the type of 'memory chip' that the card contains. Some cards contain more than one type of memory chip in order to perform different functions. For example a 'read only' chip could contain security information and a programmable chip could contain information about transactions.

Source: DB Everett: Smart Card Technology.

Box 10.11

10.33 The advantages of smartcards are that they:

- provide a high level of security both in terms of authenticating the card and verifying the cardholder;
- support the use of PKC;
- support multiple applications;
- function securely off-line, allowing the card to be used where on-line communication is either not feasible or cost-effective; and
- are a widely recognised technology.

<sup>12</sup> DB Everett: Smart Card Technology: Introduction to Smart Cards. Smart Card News Ltd. 1999



## SMARTCARD USES

The first patents on smartcard technology were filed in 1969 and 1970. The concept was expanded by the French journalist Roland Moreno in 1974, who foresaw a time when the smartcard would become a combination of a personal organiser and electronic bank manager. He and others promoted the ideas vigorously in France and it was there that the first banking trials were carried out between 1982 and 1984. The Norwegians then took up the technology as an offline security solution for electronic payments. French and Norwegian banks launched their smartcard programmes in 1984 and now have 2.1M and 1.2M cards in use respectively.

Since then smartcard technology has been taken up around the world. Most smartcards are in use as telephone pre-payment cards. But they can be used as debit cards, access tokens, SIM cards in cellular phones and for many other applications.

*Source: RC Townend. Kable*

*Box 10.12*

10.34 Smartcards can operate in conjunction with in-built security systems to ensure that the individuals using them are positively identified. Indeed, identification can be tied even more securely to an individual by the use of biometrics (see box 10.13). But smartcards are able to do far more than carry identification details; the potential for multifunctional applications means one card might substitute the many cards now carried in wallets and handbags (see box 10.12). Another important function is as an 'electronic purse', that can be 'charged' with small quantities of electronic cash. This is function is potentially of great importance to e-commerce (see quote below).

"We urgently need an e-cash system to enable those without credit cards or bank accounts to engage in e-commerce – and to facilitate low-value transactions. The urgency of this is illustrated by the recent meteoric rise in mobile phone connections, 95% of which are for pre-paid mobiles. The pre-paid mobile is the way of reaching the 5% of the population with no credit facilities – essentially they are an e-cash system."

*PIU E-Commerce Seminar Participant. May 1999*

10.35 Smartcards will soon be in use in the UK instead of the current type of credit cards. In July 1998, UK Banks announced that they will be moving from magnetic stripe cards to smartcards starting from early 1999. E-cash

has not, so far been a success in the UK. In 1995 NatWest, Midland Bank and BT jointly sponsored an e-cash system in Swindon, known as 'Mondex'. The trials failed, mainly because a critical mass of small traders did not adopt the system.

## BIOMETRICS

"Biometrics" means measuring some aspect of a person's biological make-up in such a way that it can be easily recorded. The most well-understood biometric system is finger-printing. Biometric technologies compare a person's unique characteristics (such as a finger-print) against a previously recorded image, for the purpose of identifying them. Biometric technologies are now able to record and compare many characteristics other than finger-prints: irises and retinas can be scanned, as can whole faces or whole hands. Individual voices, too, can be recognised.

The technology is now approaching maturity, and finger-print scanners (for example) can be cheaply mass-produced. The recording capacity of smartcards has now increased to the point where they are able to store sufficient information to hold finger-print, iris, retina or facial characteristics.

Biometrics can be used for both verification (am I who I claim I am?) and identity (who am I?). It has the advantage over a PIN in that it is impossible either to forget or steal!

*Source: Unforgettable Biometrics. PC Week*

*An Overview of Biometrics*

*Box 10.13*

10.36 In the rest of Europe, Governments have already begun issuing smartcards. In Germany the Social Security Authority and the Sickness Fund Doctors Association began issuing smartcards in 1993. The medical authorities see this 'Health Card' as a precursor to a multi-function card – ultimately to include an e-cash facility. France and Spain have now begun to follow Germany's example. The Spanish card contains a finger-print identification system.

10.37 The Government has an important role in the issue of certain types of smartcards. It is in a unique position to act as certification authority for the identification of individuals, through the personal databases it holds (such as the DVLA, electoral roll, passports, National Insurance (NI) numbers, NHS numbers etc.). Smartcards can be issued to the population through channels associated with any or all of the databases

mentioned above; for instance through the local Health Authority (NHS number) or at the Job Centre (NI numbers).

10.38 Smartcards might be issued by private sector partners, but used to gain access to public, as well as private services. The analogy here is with credit cards – the issuers are different, but the technology and mode of use, is the same. By ensuring that cards are ‘badged’ differently, and that they are issued voluntarily, such smartcards could not be mistaken for identity cards. Further reassurance can be given by a clear and open data-protection policy that will allow the public to ‘opt-in’ only to those Government services that they wish to receive in this manner.

10.39 There is potential for commercially developed smartcards to be used multi-functionally in support of delivering Government services – for instance allowing holders to pay tax and VAT, identify themselves, and hold electronic cash. The danger here is that so much functionality on one card will be an invitation to fraud. To prevent this biometric verification or other forms of strong authentication systems need to be built in. The Government’s UK biometrics working group should be encouraged to give firm guidance on this issue as soon as possible.

10.40 Significant Government activity is already taking place:

- On 8 December 1998 an operational pilot of the ‘Intelligent Form’ scheme was launched. This project involved Inland Revenue, HM Customs and Excise and the Department of Social Security’s Contributions Agency. It was co-ordinated by CITU, with the co-operation of Microsoft, EDS and National Westminster Bank. Once completed the form is signed electronically – and this can be done using a smartcard. It is expected that commercial systems for issuing and managing these smartcards will become available by the end of 1999 – thus supporting a wider roll-out of the ‘Intelligent Form’. Successful completion of this project enabled the Inland Revenue and HM Customs and Excise to launch the ‘Early Adopters’ project in March 1999. Electronic VAT returns are being piloted in 1999. And people completing self-assessment tax-returns will be able to submit these on the

Internet, using a smartcard and a digital signature authenticated by a bank, from April 2000.

- The possibility of patient smartcards has been raised by the NHS’ seven-year IT strategy. The issue of smartcards to some NHS staff for giving access to sensitive record systems and for identification purposes is currently also being considered, and a pilot trial is underway.
- In accordance with Modernising Government White Paper commitments, CITU is currently chairing an interdepartmental steering group on card technology, which aims to develop a framework for the use of smartcards for Government-Citizen e-business by Autumn 1999.

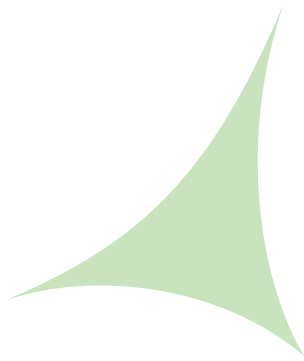
10.41 The new e-Minister (see chapter fourteen) should support the work of the groups on biometrics and card technology and should ensure that all the interested parties, in both the public and private sector, are brought together to move these initiatives forward. In view of the remarks in 10.38, the Data Protection Registrar must also be involved at an early stage. The targets should be as follows:

- CITU to issue guidelines on the use of smartcards for Government/citizen e-commerce by December 1999;
- as part of this, CITU to promote concerted, collective discussions with interested parties within Government departments and agencies and industry;
- by July 2000, CITU to set up a prototype Government ‘portal’ to facilitate payment and act as a ‘one-stop-shop’<sup>13</sup> with an authentication system that is backed by a private sector smartcard; and
- CITU to monitor the ability of departments to provide services using private sector smartcards as part of the programme of monitoring targets for the electronic provision of Government services:<sup>14</sup> 25%, 50% and 100% by, respectively, 2002, 2005, and 2008.

10.42 Smartcard schemes of this kind will provide significant leverage to the whole of the UK economy to move to e-commerce. As a result smartcard readers could be installed in public places, and be routinely attached to PCs and TV set-top boxes. They could also be used for public transport

<sup>13</sup> As in Modernising Government Action Plan (27 July 1999)

<sup>14</sup> See the Modernising Government White Paper (Cm 4310, March 1999) chapter 5, paragraph 16



and in libraries and may even replace passports.

## EFFECTIVE ENFORCEMENT

Recommendation 10.4: ensure Government departments quickly take advantage of the equivalence between digital and written documents

10.43 At present there is no clear recognition of the equivalence between written and digital documents. As a result there are potential legal complications with disputes over e-commerce transactions. Part II of the draft Electronic Communications Bill contains powers that will allow Ministers to update the statute book to ensure that, where appropriate, electronic means can be used as an alternative to the traditional pen and paper. However, steps must be taken by Government departments to ensure that advantage is taken of this as swiftly as possible. The legal recognition of electronic documents will help to authenticate contracts – thus solving some of the problems of liability and redress.

10.44 Departments will carry out actions to ensure equivalence through the application of a 'Henry VIII' power that enables Ministers to modify any existing legislation to ensure that it permits equivalence between digital and written documents. Both national and international problems are associated with this move. Nationally there must be concern at the potential volume and complexity of the legislation that needs to be modified. Internationally there is a need to ensure that digital contracts are afforded the same recognition in other countries (see chapter seven).

10.45 A significant degree of co-ordination will be needed to ensure that measures to acknowledge legal equivalence of written and digital signatures marches in step between departments. This could be accomplished through the system of departmental 'Information Age Champions' that has already been set up. However, it will also need input from the e-Minister and e-envoy (chapter fourteen), and in particular from the recommended network of junior Ministers. It is important that work on this starts in parallel with the passage of the Electronic Communications Bill through Parliament.

Recommendation 10.5: improve technical capability of law-enforcement and regulators and establish an Internet Crime Unit

10.46 Detection of fraud and Internet-related crimes is currently a particular problem because of the absence of any central, easily identifiable resource in this area. There are a many isolated sources of expertise on Internet crime located within individual police forces, local authority trading standards offices, the Office of Fair Trading and the National Criminal Intelligence Service (NCIS), as well as in the Internet Watch Foundation (IWF). With the growth in the use of the Internet for fraudulent purposes (see above) there is a need for greater co-ordination of detection and enforcement effort. And the technical ability to investigate such crimes must be made available to those in the police and local authorities that are to investigate and prosecute offenders. A single Internet Crime Unit was recommended in the NCIS report on Project Trawler.<sup>15</sup> The PIU Team endorses this recommendation as a practical way of co-ordinating expertise and ensuring clear lines of responsibility.

"The proposed national unit would have three broad roles: to investigate the most serious 'IT crimes'; to act as a centre of excellence for 'cybercrime' issues; and to support local forces which encounter offenders using sophisticated IT skills."

*Project Trawler: Key Judgements. June 1999*

10.47 A strengthened law-enforcement ability will send a clear signal to potential Internet criminals that Internet crime does not pay. It will help to boost the confidence of both e-commerce buyers and sellers. Similarly, stronger detection and presentation effort will deter hackers, spammers and those, such as paedophiles and racists, who place illegal material on the Internet.

"More people are online, and more people are getting scammed. Consumers need to remember that con artists are everywhere – even in cyberspace."

*Susan Grant, Director of Internet Fraud Watch 1999*

<sup>15</sup> Project Trawler: Crime on the Information Highways. A major report from the UK National Criminal Intelligence Unit. Published June 1999

10.48 The new e-Minister (chapter fourteen) should put his or her authority behind the NCIS proposal for an Internet Crime Unit and a register of Internet expertise. These recommendations have been accepted by the Association of Chief Police Officers (ACPO) crime committee and discussed by the ACPO Council. The matter is currently being considered by the Home Office. We recommend that the Home Office initiates action as soon as possible to drive this recommendation forward.

Recommendation 10.6: build on the recommendations in the PIU report: 'Encryption and Law Enforcement' on Government/industry co-operation

10.49 Law enforcement issues connected with the Internet are often hampered by lack of understanding. Among the most significant of the PIU's recommendations in their report on 'Encryption and Law Enforcement'<sup>16</sup> is the recommendation that the approach to this problem should be based on co-operation with industry, and that a forum between Government and industry should be established to discuss encryption matters (see quote below).

"A new Government/Industry joint forum should be established to discuss the development of encryption technologies and to ensure that the needs of law enforcement agencies are taken into account by the market. This new co-operation should also be promoted at the international level. The forum should consist of a high level group to discuss policy issues and be supported by specialist technical and legal groups."

*PIU Report on Encryption & Law Enforcement.*  
May 1999

10.50 Industry has a distrust of regulatory and legal frameworks, which they believe may unduly restrict their ability to trade freely. In e-commerce there has been a history of distrust of Government motives in connection with encryption. However, building on the framework of trust between Government and industry created during the PIU study, will lead to co-operative measures to build secure, trusted frameworks for credit transfer and to protect systems against hacking.

10.51 There are a number of on-going, joint initiatives on e-commerce between Government and industry – such as the DTI's Information Age Partnership, CITU's Industry Consultative Committee as well as the Government/industry forum on encryption, mentioned above. It is important that all these are co-ordinated to ensure that industry recognises Government efforts in the e-commerce arena are well focused. It is recommended that there should be representation from the e-envoy's team (chapter fourteen) on the Government/industry forum on encryption.

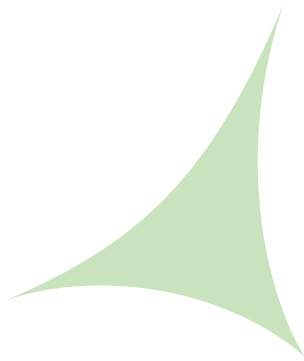
Recommendation 10.7: the Home Office should re-consider the case for using non-jury trials for serious fraud (including e-commerce fraud)

10.52 One enforcement problem concerns the difficulty the authorities have in getting convictions in trials involving complex, technical matters (such as serious fraud), as a result of the UK's jury system. One solution favoured by the PIU Team was to use non-jury trials. These are not unknown in criminal trials within the UK – stipendiary magistrates fulfil that role in summary cases, and judges sitting alone have been used in Northern Ireland for terrorism-related offences. Such trials have also been proposed for cases involving serious fraud (see the quote below). The Internet is a complex place, both technically and conceptually. Trading can take place with equal ease between two users in adjoining streets or in different continents. This makes it easy for a fraudster to cover his or her tracks and makes it difficult for law enforcement to prove the connection between a real individual and a 'virtual' crime. For all these reasons, which are similar to those put forward by advocates of non-jury trials for other types of serious fraud, non-jury trials are a valid way forward.

"A criminal tribunal, headed by a Judge and advised by market professionals, has much to recommend it. The proceedings would certainly be curtailed: no need to try and explain at great length what a stock option is, or a rights issue, or a butterfly straddle or even Lloyd's of London"

*Rosalind Wright, Director of the Serious Fraud Office*  
1997

<sup>16</sup> PIU Report 'Encryption & Law Enforcement' May 1999



10.53 In February 1998 the Home Office published a consultation document: "Juries in Serious Fraud Trials".<sup>17</sup> Response to the consultation document was not large, and the matter is at present still under consideration. It is recommended that the Home Office reconsider the issue of non-jury trials for serious fraud, and should include the concept of Internet fraud within the selection criteria set out in their consultation document. The e-envoy (chapter fourteen) should carry this forward with the Home Office for a decision on possible legislation as soon as possible.

Recommendation 10.8: the Government to encourage the EU to achieve a co-regulatory approach to e-commerce enforcement and redress.

10.54 As noted in chapter five, enforcement authorities will face big challenges in cross border cases within the EU and globally. In view of the global nature of e-commerce, the recommendations made in this chapter will be of limited value without international agreement. Co-operation between national authorities is developing, for example among the major countries that belong to the International Market Supervision Network. The OECD is developing guidelines on consumer protection in e-commerce. However, more needs to be done. In Europe in particular there is scope to build on earlier initiatives to promote consistent, effective enforcement. The draft Directive on e-commerce proposes measures to facilitate enforcement co-operation. The Government should make practical delivery of this proposal a priority over the next six months,

with the aim of achieving in each EU country a source of e-commerce enforcement and redress following the co-regulatory principles of TrustUK. And for these mechanisms to operate in co-ordination across all member States, such that members of one State can expect the same standards of redress and enforcement to operate in all other States.

## APPROPRIATE EDUCATION

Recommendation 10.9: ensure action is taken to give protection of Intellectual Property Rights (IPR) a understanding and that DCMS work with the creative industries to put in place standards and infrastructure to ensure that content is protected in transmission and that adequate remuneration is received for the exploitation of intellectual property.

10.55 It was demonstrated above that the music industry is suffering serious problems in relation to the proliferation of 'free' music on the Internet. Intellectual Property Rights (IPR) are an important concept in relation to e-commerce because the Internet allows anything that is 'digitisable' – such as music, design, research, creative writing, mathematical formulae, and computer software – to be spread world wide quickly and easily. This has advantages in terms of the rapid diffusion of new ideas but if companies cannot enforce their intellectual property rights it may seriously weaken the incentive to innovate.

### IMPRIMATUR

A 'Creator' delivers his 'Creation' to the 'Creation Provider'. He may also assign exploitation rights to a 'Rights Holder'. Information about the contractual relationship between the Creation Provider and the Rights Holder is stored and maintained in the 'IPR Database'.

The Creation Provider obtains a unique number for the Creation from the 'Unique Number Issuer'. This number is imprinted onto the Creation for latter identification. A 'Media Distributor' may then distribute it in digital form after obtaining permission from the Rights Holder through a licence specifying terms.

To obtain a Creation, a 'Purchaser' contacts the Media Distributor. The Media Distributor generates a personalised copy of the Creation and allows the Purchaser to download it with terms and conditions of use.

The Media Distributor then passes royalties to the Rights Holder. Payment details are stored in the IPR Database. Payment is performed online in an electronic form.

All Creation transfers are logged by means of a 'Monitoring Service Provider'. This allows Rights Holders and Creators to verify the number of Creations sold and that they have received all corresponding royalties.

*Source: IMPRIMATUR paper submitted for PIU E-Commerce Seminar*

*Box 10.14*

<sup>17</sup> Juries in Serious Fraud Trials. A Consultation Document. Home Office February 1998

"The general public feel that copying weightless material is not theft – because the owner is still left with the product. IPR is a very subtle economic concept, difficult for the public to grasp. However, intellectual property is a resource in which the UK is particularly rich and it is therefore especially necessary to demonstrate its importance."

*Participant at PIU E-Commerce Seminar. May 1999*

10.56 The EC's IMPRIMATUR project has devised a technologically-neutral business model for the protection of IPR (see box 10.14). However, technological and business process solutions are not sufficient. There must be a fundamental change in attitude towards intellectual property in society as a whole.

10.57 The Government is already taking some action on this issue. A sub-group of the inter-departmental Creative Industries Task Force (CITF) is examining IPR as it affects the creative industries, including digitally produced and/or delivered products. Three working-groups have been set up with rapporteurs from industry to examine:

- awareness and public attitudes;
- understanding and user awareness; and
- education and training.

The groups will meet during summer 1999, and present proposals to the CITF by December 1999. It is likely such proposals will include an awareness campaign, and encouraging right-owners to think about ways in which they can make the system more user-friendly. However, DCMS in particular will need to do more work with the audiovisual industry in this area to ensure that adoption of standards such as IMPRIMATUR.

10.58 The e-envoy (chapter fourteen) must raise the profile of IPR by ensuring that the prosecution of infringement cases receives greater publicity and that explanations of the significance and value of IPR are incorporated into the education process. By developing a culture in the UK where IPR is understood and respected we will produce an atmosphere that will help business feel more secure about engaging in e-commerce. The DCMS work with the audiovisual industry must be driven forward under the aegis of the e-Minister (chapter fourteen).

Recommendation 10.10: provide "parents' Web sites" and encourage software companies to supply free content-filtering software

10.59 A May 1999 survey of US parents showed that 78% have concerns about the content of Internet material to which their children have access.<sup>18</sup> Software is available to filter the content of Internet (see box 10.15) but the same survey also found that such software is in use by only one-third of US parents whose children have access to the Internet. In his speech to the House of Commons on 18 March 1998,<sup>19</sup> the Minister for Science, Energy and Industry stressed the importance of such filtering tools. Unfortunately, the availability of such software is not widely publicised in the UK, although AOL has a scheme whereby its subscribers are offered content filtering software at no extra charge.

10.60 The Government has embarked on an ambitious programme (the National Grid for Learning) to ensure that all schools are connected to the Internet.<sup>20</sup> As part of this scheme the Team recommend that the Government sets up 'parents' Web sites'. These would provide links to the National Grid for Learning to enable parents to participate in this excellent initiative. These sites should contain software for content filtering that can be downloaded freely by both parents and schools. Such an initiative will make it clear that the Government takes parents' concerns seriously and is prepared to take active measures to meet those concerns.

10.61 The e-envoy (chapter fourteen) should investigate the best way to set up parents' Web sites, with links to such software. The e-Minister should approach software companies and ISPs about the provision of this software for free. The ability of concerned carers (parents and educators) to gain access to free filtering software will go a long way to meeting their concerns about the type of material that vulnerable groups may access if they are allowed unrestrained interaction with the Internet.

<sup>18</sup> Roper Starch Worldwide Survey. May 1999

<sup>19</sup> Memorandum from John Battle. DTI 18 March 1998

<sup>20</sup> Our Information Age – the Government's Vision. Central Office of Information URN 98/677; 4/98

## SOFTWARE FOR FILTERING INTERNET CONTENT

Filtering Software	Cyber Patrol	Cyber Sitter	Net Nanny	Surf Wash
Software Company:	Microsystems Software Inc.	Solid Oak Software	Net Nanny	Spyglass Inc.
Price:	\$39.95	\$39.95	\$39.95	\$39.95
Content Filtered:	violence/profanity, partial/full nudity, sexual acts/text, intolerance, satanic/cult, drugs/drug culture, militant/extremist, sex education, questionable/illegal & gambling, alcohol/tobacco	adult, sexually oriented, violence, gay/lesbian, illegal/radical activities, hate/intolerance, cult/occult, sports and leisure, advertising	<i>categories not named specifically but include:</i> sexually explicit, violence, hate speech, drugs/ alcohol	sexually explicit, violence, hate speech, drugs/alcohol, gambling

Source: <http://www.familyguidebook.com/>

Box 10.15

## MARKET-LED INITIATIVES

10.62 Users are concerned that unrestricted use of their personal data can be made by Web sites as an inherent result of the way the Internet works. They also have problems in deciding when, and how to use their personal data. The problems can be solved by 'Infomediaries'. These are Internet sites that facilitate improved data exchange between Web sites and users by helping to protect their personal information and making their interaction with sites more convenient. An Infomediary can effectively become the 'trusted agent' that stands between an Internet user and the rest of the Web. For instance they can act on the

consumer's behalf to look for bargains or pay taxes and VAT.

10.63 An agent of this kind can also help to:

- protect the privacy of a user by preventing a user's e-mail address from being broadcast;
- intercept spam;
- help other businesses by ensuring that personal data is given to businesses which may be of interest to a consumer (with the consumer's permission);
- authenticate Internet traders on behalf of consumers;

## US INFOMEDIARIES

P3P (privacy preferences project)	Platform that enables users to exercise preferences over a website's privacy practices. Software applications that allow users to be informed about website practices, delegate decisions to a computer agent if they wish and tailor relations with specific sites.
Populardemand	Uses a proprietary technology to preserve the anonymity of members while matching them with deals targeted to their interests
PrivaSeek	consumer 'infomediary' using an information control tool that lets consumers automatically safeguard & gain value from their information on the Web
Lumeria	'personal knowledge management' software helps individuals securely organise information & knowledge. This information can then be shared & published for 'fun & profit'. 'Identity management' software enables the individual to securely maintain one or more identities on the Net.

- protect consumers against content they do not wish to see;
- negotiate contracts on a consumer's behalf; and
- help settle disputes between consumers and e-traders.

10.64 A number of Infomediary companies have become established in the USA recently (see box 10.16). The concept has not yet taken off in the UK with quite the same vigour. However, the Team has been able to identify a few such companies in the UK, and two are described in box 10.17. The e-envoy (chapter fourteen) should publicise the advantages of Infomediaries as significant enhancers of e-commerce trust.

#### UK INFOMEDIARIES

**Ace-quote.com:** This is an e-commerce company that assists businesses to make purchases by enabling them to post their IT requirements on the Internet and processing quotes from suppliers.

**Obongo:** solves current problems experienced by users concerning: data protection and junk e-mail; slow and repetitive registration processes; forgotten user names and password; changing and updating personal profiles; loss of e-mail contact with change of address.

Solves current problems experienced by e-traders concerning: loss of potential users through failure to register (40% fail at present); failure by users at log-in because of password problems; failure to reach users because of change of address; poor marketing because of erroneous personal data; high cost of user acquisition.

The Obongo solution is a centralised profile management system benefiting users by giving users a single: privacy control tool; registration for sites; log-in for sites; username and password for all sites; e-mail control point. And sites by giving them: low cost source of new users; better returns on existing users; extended reach to existing users.

*Box 10.17*

# 11. GOVERNMENT AS EXEMPLAR

## SUMMARY

11.1 As described in chapters eight to ten, the Government has a unique role to play in taking actions that will remove existing barriers and further promote e-commerce. In both chapters eight and ten, instances were given of the Government's role in promoting e-commerce to business and the public – as head of a large supply chain and as an organisation with which everyone must interact. The Government therefore has the potential to act both as an exemplar and an engine for change.

11.2 Government can be seen as a mechanism that interacts with business and public through inputs (procurement) and outputs (service and information delivery). Between these two there is a process of internal Government operation (see figure 11.1). All three areas are open to change through the action of e-commerce.

11.3 This chapter is therefore divided into three sections:

- transforming procurement;

- transforming the internal processes of Government; and
- transforming information & service delivery.

11.4 The main recommendations to exploit Government potential under each of these headings are below.

- Transforming procurement by:
  - Recommendation 11.1: publication of departmental performance against targets in electronic procurement;
  - Recommendation 11.2: campaign to get SMEs more involved in Government procurement; and
- Transforming the internal process of Government by:
  - Recommendation 11.3: internationally benchmarking Government e-commerce targets; and
  - Recommendation 11.4: initiating an 'Internet node' programme,

## GOVERNMENT INTERACTION MECHANISMS

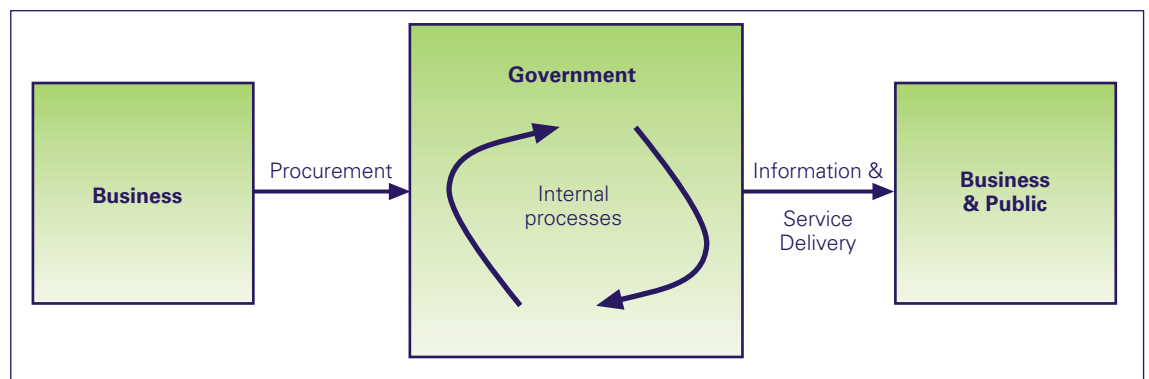


Figure 11.1

enabling transfer of the human and organisational skills that are needed to take advantage of e-commerce, from private- to public-sector senior management.

- Transforming information & service delivery, encouraging the private sector to challenge traditional methods of Government service delivery by:
  - Recommendation 11.5: using the Invest to Save Budget to build alternative Government electronic delivery mechanisms; and
  - Recommendation 11.6: extending the dialogue with the private sector over use of the evolving Crown copyright management system with a view to widening the adoption of a class licensing system.

recommendation of this review was the establishment of a central Office of Government Commerce (OGC), under an OGC Supervisory Board, which would oversee all civil Government procurement activities – thus addressing some of the problems of co-ordination. The MoD too is currently also in the early stages of a separate project to introduce electronic purchasing for military spending – the Defence Electronic Commerce Service (DECS). But neither of these initiatives will involve the significant procurement requirements of the NHS.

11.7 These initiatives are taking place separately. As a result they are in danger of not using the same standards or setting coherent protocols. Co-ordinating action should be driven from the centre – possibly through e-envoy (chapter fourteen). If Government does all its e-commerce procurement business according to consistent and coherent standards and protocols (such as that for a PKI – see chapter ten), it will encourage business to adopt the same standards and protocols for their own use. This will not only enhance general standards in e-commerce, but will develop confidence in users – by giving the assurance of the same 'look-and-feel' for e-commerce transactions with a wide range of Web traders.

11.8 The scale of Government electronic interaction with the public is enormous, at approximately 1.5bn transactions annually. The Government is committed to developing e-commerce by putting many of its own services on-line, and has set targets for the electronic provision of Government services of 25%, 50% and 100% by, respectively, 2002, 2005, and 2008.<sup>2</sup> CITU is responsible for measuring the success of departments in achieving these targets, and the first report was published in Spring 1999.<sup>3</sup> The summary of the report findings is in box 11.1. However, despite the excellent efforts to meet and exceed the targets, there is significant concern in both industry and Government that these efforts may be less than fully effective without some change in the culture of Government (see box 11.2).

## BACKGROUND AND DEFINITIONS

11.5 The extent to which Government can act as an exemplar and driver of e-commerce through its own supply and distribution chains has emerged as a key issue for the PIU E-Commerce project. The size of the Government procurement effort is enormous. It is estimated that central Government spends about £12bn annually on procurement of goods and services (32% of the total budget of £37bn). This does not include the MoD's spend on goods and services, which could add a further £4bn (20% of £21bn). Nor that of the NHS which, assuming it to be 30% of its total budget of £44bn, could be as much as £13bn. An estimated total of £29bn annually is therefore spent by Government on procurement of goods and services. These figures do not include those for local authorities, which account for a further approximately £19bn. In all cases the principal objective should be for Government to get good value for money, but there is huge capacity for a procurement effort of this size to leverage business in the UK and thus act as an engine of change.

11.6 An extensive review of central Government civil procurement was recently conducted and a report of its findings<sup>1</sup> produced in July 1999. The main

<sup>1</sup> Review of Civil Procurement in Central Government. London: July 1999

<sup>2</sup> 'Modernising Government' White Paper. Cm 4310. March 1999

<sup>3</sup> <http://www.citu.gov.uk/25percent/spring99.htm>

25% INITIATIVE: SPRING '99 PROGRESS TO DATE: OVERALL FINDINGS

ALL GOVERNMENT	1999 total annual volume (millions)	Capability %	2002 projected total annual volume (millions)	Projected capability %
All reports	582	38	632	71
Excluding payments through banking system	480	32	518	70
Excluding payments, and business transactions of Inland Revenue & Customs	286	22	307	55

Box 11.1

11.9 The Team has looked at the way that the White Paper targets are currently being addressed. They are happy that the targets themselves are correct for service delivery, and that the technology is being put in place to meet them. However, there is some concern that the targets are perhaps not ambitious enough and that no element of international comparison has been included. For procurement, the targets themselves are not specific enough. CITU and the 'Information Age Group of Champions', announced by the Public Service Minister on 28 May 1999, are undertaking a programme to address the behavioural and cultural changes that are inherent in moves to perform Government business electronically. However, the Team believes that there is other action that can be taken.

11.10 The following section provides analysis of some of these problems in the three areas described above (procurement, intra-governmental transformation, and information and service delivery). It describes the key

recommendations in each area to address the concerns outlined above, and where appropriate gives examples of how the recommendation might be developed.

## RECOMMENDATIONS AND ANALYSIS

### TRANSFORMING PROCUREMENT

11.11 The Treasury Procurement Group is building on the report of the review of central Government civil procurement referred to in paragraph 11.6. The Procurement Group's provisional targets are outlined in box 11.3. This also contains the Procurement Group's plans for an electronic 'supplier database' and procurement requirements Web site.

Recommendation 11.1: Publication of departmental performance against targets in electronic procurement

#### QUOTATIONS RELATING TO GOVERNMENT'S ROLE

##### Quotations from Business

"E-commerce is best delivered as an alternative to existing services by an entirely new unit, rather than as evolving from within existing services. There is an obvious issue for Government here, as it moves from traditional patterns of interacting with the public into new electronic services."

"It is vital for new channels of communications between Government and public to be put in place."

Source: E-Commerce Seminars

##### Quotations from Government

"It requires a huge effort of coordination and adequate resource are not usually available. There is no consistency to how different Departments receive or handle information"

"Problems of lack of finance, lack of willingness of Departmental staff to be involved, continuing changes in technology"

Source: E-Commerce Seminars

Box 11.2

## TREASURY PROCUREMENT GROUP PROVISIONAL TARGETS

by 31 December 1999:

- to advertise 25% high value procurement requirements electronically & publish documentation on the Internet;

by 31 March 2000:

- advertise 90% high value procurement electronically & publish documentation on the Internet;
- make 50% low value purchases electronically;
- pay for high-value purchases by electronic funds transfer; and
- to be able to interface with a central system to receive tenders electronically. (Note: this will depend on the early implementation of the Electronic Communications Bill to establish parity for electronic and digital signatures).

by 31 March 2001:

- to make 90% of low-value purchases electronically

Also proposed is the establishment of a central, cross-government database of suppliers, accessed from a Web site on the Internet, holding basic information about suppliers. Information to be maintained by each supplier. Also a Web site 'Government Prospects' advertising 90% of all high-value procurement requirements.

Box 11.3

11.12 The Team recommends that the existing target, for 90% of routine procurement to be conducted electronically by March 2001, should be closely monitored as part of the CITU six-monthly report. In addition it is recommended that detailed targets, along the lines of those in box 11.3, are agreed quickly by departments, driven forward strongly and subjected to monitoring, similar to the other electronic Government targets. The OGC should also publish a clear, concise definition of what is meant by 'low value transactions'.

Recommendation 11.2: Campaign to get SMEs more involved in Government procurement

11.13 One complaint by the DTI's Information Age Partnership is the absence of a clear Government Procurement Framework to allow large corporations, and especially SMEs to trade with Government on-line. The establishment of a 'Government Prospects' Web site (box 11.3), which advertises high-value procurement programmes, will go some way to answer that complaint. However, there is some concern that the adoption of e-commerce in Government procurement may make it more difficult for SMEs to become involved. A concerted campaign should therefore be mounted to get more SMEs engaged in Government procurement and pro-active help should also be given to SMEs on how they can best present their products and/or services in ways which meet Government's needs. Reviews should also be undertaken of

departments' procedures to ensure they are not biased against SMEs.

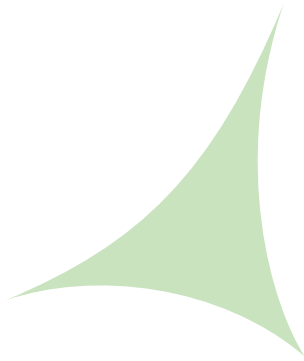
## TRANSFORMING THE INTERNAL PROCESS OF GOVERNMENT

Recommendation 11.3: Internationally benchmarking Government e-commerce targets

11.14 The Government's e-commerce targets, from the Modernising Government White Paper, are set out in paragraph 11.8. Progress towards these is being monitored by CITU. However, currently there is no equivalent, for Government e-commerce targets, of the DTI's 'Spectrum' international benchmarking studies of e-commerce in industry. There is therefore no way of measuring the Government's own progress towards making the UK the best place for e-commerce. The Team therefore recommends that an annual international benchmarking study be carried out on Government e-commerce targets.

Recommendation 11.4: Initiating an 'Internet node' programme, enabling transfer of the human and organisational skills that are needed to take advantage of e-commerce, from private- to public-sector senior management

11.15 The 'Modernising Government initiative' sets out proposals for 'joining up' public service to ensure effective decision



making and effective delivery. Technically, the Government is making good progress towards this. With the advent of the Government Secure Intranet (GSI) it is now theoretically possible to initiate knowledge sharing by departments, using Internet tools such as search-engines, and CITU are taking this forward as part of their commitment to develop services on the GSI. There are already some examples of the advantages of knowledge-sharing (see box 11.4). But there are many difficulties in using such tools effectively and to the best advantage. These difficulties are not primarily technical, but a result of the human and organisational issues connected with the implementation of the new technology.

#### KNOWLEDGE-SHARING IN THE NHS

Better management of patient care is a clear target for knowledge-sharing technology. Leeds hospitals are now connected so that digitised X-ray images can be sent both internally and between hospitals. This system allows clinicians to make the best decision on how to manage patients. It also enables resources to be used more efficiently.

Ayrshire and Aran health board have connected the three local health trusts and all 64 GP practices in their area through the Internet. Circulars and messages are now e-mailed, ensuring that they are up-to-date and prioritised. Lab reports can be sent more efficiently and without delay.

Source: *Public Finance*. March 12 1999.

Box 11.4

11.16 The Government is not alone in facing the problems of human and organisational change that accompany the technological changes now taking place. Many large corporations have already had extensive experience of similar problems. A programme is needed to enable Government to take advantage of this experience. The Team therefore recommend the initiation of an 'Internet node' programme that will enable senior managers in Government to take advantage of this experience. Such training will bring together senior managers in Government and senior managers from business in a programme where they can pass on the 'why' and 'how' of the cultural and organisational changes that have been brought about in their sectors through the introduction of e-commerce.

## TRANSFORMING INFORMATION & SERVICE DELIVERY, ENCOURAGING THE PRIVATE SECTOR TO CHALLENGE TRADITIONAL METHODS OF GOVERNMENT SERVICE DELIVERY

Recommendation 11.5: Using the 'Invest to Save Budget' to build alternative Government electronic delivery mechanisms

11.17 There are already some good examples of electronic delivery within Government (see box 11.5). However, departments have been free to define their own basket of electronic services. Consequently, the basket generally includes an *ad hoc* mix of Internet Web sites being developed as extensions of the Government's Secure Intranet (GSI), call centres and dedicated EDI links by Government Departments, agencies and industry acting on behalf of Government. A study by PricewaterhouseCoopers for the DTI<sup>4</sup> found that differentiation was often low and there was little organisation of sites in terms of business processes (for instance, linking descriptions of regulatory requirements to descriptions of fulfilment procedures, grant applications and form-filing possibilities). Furthermore, integration of local, national and European Union information and requirements was virtually non-existent.

11.18 A survey of Internet users in January 1999<sup>5</sup> identified the presence of a clear and well-known 'brand' and ease of being able to move to and around a Web site ('navigation') as the two most important factors in giving users confidence in e-commerce. Among the current problems with the current delivery of Government information and services electronically are:

- lack of common look and feel (brand);
- difficult access (navigation); and
- complexity (navigation).

11.19 Casual inspection of a range of Government Web sites will demonstrate that there is generally a lack of common look and feel or 'UK Government brand image'. This must be viewed as a missed opportunity to

<sup>4</sup> PriceWaterhouseCoopers, "Better Regulation Unit: Cabinet Office Electronic Delivery of Regulation," London: 5 March 1999.

<sup>5</sup> Cheskin Research and Studio Archetype/Sapient. January 1999.

### THREE TYPES OF EXISTING GOVERNMENT WEBSITES

1. Offering general information about Government
  - Involve generally passive consumption (though usually with some e-mailing capability incorporated for comments). Example: Number 10 website (<http://www.number-10.gov.uk>);
2. Providing official forms and regulatory compliance information
  - Structured search and directory facilities allowing some limited interaction. Example: Direct Access Government website (<http://www.open.gov.uk>);
3. Offering document filing and payment systems
  - Provide a significant degree of highly structured interaction (extranet and internet applications being developed for SMEs and consumers as additions to Inland Revenue and Customs & Excise EDI connections with large businesses).

#### **Example: cross-departmental pilots**

- INFOSHOP, which brings together in partnership 16 local authorities, the Cabinet Office, DETR, DH, and HSE, and the University of Salford to enable local government front-line staff resolve customer queries, including complex ones involving more than one local authority or Department;
- Direct Access Government, managed by the CCTA on behalf of the DTI, which provides a centralised search engine for documents on individual government departmental Web sites.

Box 11.5

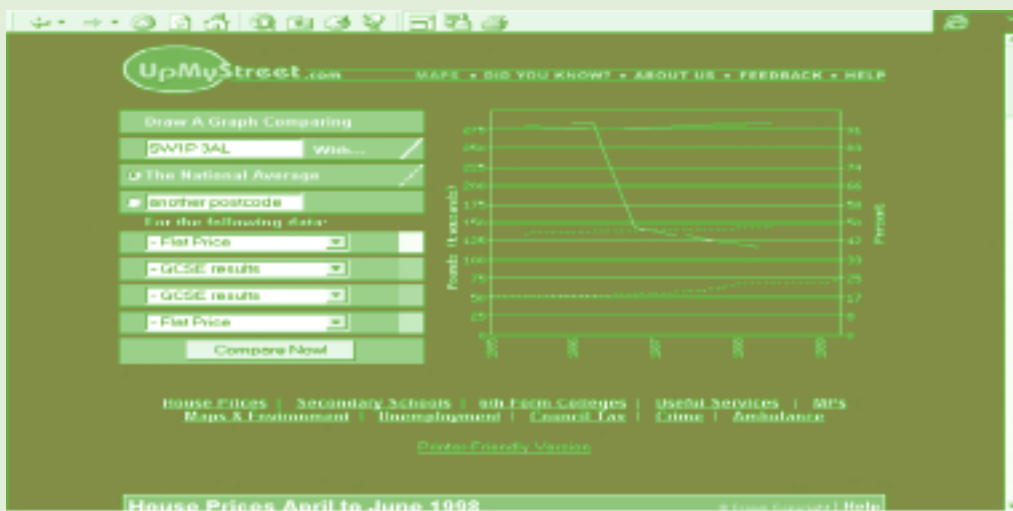
promote user-confidence. Use of the sites ('navigation') is also a problem. As an example, the difficulty of locating the Modernising Government White Paper using CCTA's search facility<sup>6</sup> may be cited. The move to electronic forms by some departments (see box 11.5) is to be welcomed, but many of these are too complex and lengthy to complete on-line (navigation). For an example of truly innovative and user-friendly treatment of Government information it is necessary to turn to the private sector (see box 11.6). Acknowledgement of Government authorship

through the Crown copyright imprint, however, can be seen as meeting some of these concerns.

11.20 Many of the issues raised in paragraphs 11.17 – 11.19 are being addressed by Government, following the recommendations in chapter five of the Modernising Government White Paper. There are now specific commitments to guidelines for the look and feel, management and development of Government Web sites. A relaunch of the CCTA open.gov site is planned. CITU is discussing with the DTI

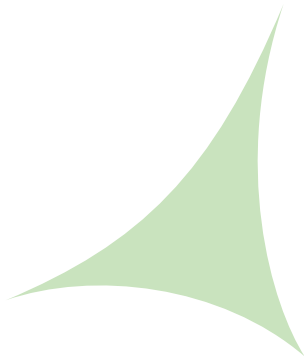
### UPMYSTREET.COM

<http://www.upmystreet.com> is a Web site that was developed by a private sector company, working part-time over a period of about three months. The total cost was about £10,000. The Web site employs Government information, presenting it in a novel and user-friendly way. The appearance of the site is shown below.



Box 11.6

<sup>6</sup> <http://www.open.gov.uk/>



and HM Treasury the recommendations on gateways in the PriceWaterhouseCoopers study (11.17). The benefits of setting up a Central Internet Strategy Unit (CISU) for Government are being considered. The Team proposes that there is merit in building on the CISU initiative by being more pro-active in the use of the 'Invest to Save' budget to bring into Government resources from the

private sector. For example, CISU could identify those departments that would most benefit from the use of funds from this budget. These would be used to finance private/public sector partnership that will develop innovative pilot projects using e-commerce. A potential project is identified in box 11.7.

#### GUARANTEED ELECTRONIC MARKETS (GEMS) IN JOBS

The concept of 'Guaranteed Electronic Markets' (GEMs), put forward by Wingham Rowan in his book 'Net Benefit' (Macmillan 1999), offers a secure infrastructure that will enable anyone to trade in goods and services without fear of being defrauded. The system guarantees insurance cover for both sellers and buyers, automatically allows risk to be set against cost and provides swift access to a Government-backed arbitration service.

Taking the example of someone who wishes to have part-time employment as a babysitter. They would have to obtain basic endorsement from the local police and local authority and would have to find a suitably sized 'bond', which could be obtained through a GEMs insurance scheme. After each job, the GEMs system would automatically update their employment record – thus giving prospective employers an indication of their reliability. The system would also indicate demand in their sector – allowing optimum work-planning and indicating where competitive advantage could be taken. Greater experience in a sector would enable a higher price to be charged. Once a track-record had been established as a babysitter, GEM would then allow the individual to go on to offer their services as a child-minder, with their previous job-record being taken into account. Such a system would enable the unemployed to develop a portfolio of work on their own account – potentially turning everyone into an entrepreneur.

*Source: 'Net Benefit'*

One possible use of such a system would be in connection with the DfEE's 'Learning and Workbank' project.

The "Learning and Workbank" project brings together ideas about internet based information and advisory services – developed within the Employment Service and in other parts of DfEE – importantly in the University for Industry, which will mount its "Learning Direct" service via the Internet by next year. A number of other countries have already established similar Internet based services, notably the US, Australia and Sweden.

The aim of the Learning and Workbank project is to provide, by Autumn 2000, an Internet Site which will act as a "portal" for access to all the key services relating to jobs and work-related learning. The key components will be:

- job vacancies held by the Employment Services – possibly with private sector agencies and media also contributing;
- a CV bank – to help people create CVs and log them for employers to search;
- learning opportunities information – through direct access into Ufi's Learning Direct site; and
- careers information and advice.

*Source: DfEE*

*Box 11.7*

Recommendation 11.6: extending the dialogue with the private sector over use of the evolving Crown copyright management system with a view to widening the adoption of a class licensing system.

11.21 The largest producer of information in the UK is the Government. Much of this information is protected by Crown copyright. For some time now, the information industry has been pressing Government to move towards the US approach, where all information produced by the federal government is made freely available to the private-sector – to repackage and sell-on in innovative ways which add value for the customer. The Government responded in March 1999 with the Crown Copyright White paper<sup>7</sup> (see box 11.8). However, whilst seeking to meet concerns expressed about ensuring integrity of Government data and the ability for Government itself to trade in and add value to its information, the Government decided to continue the delegations of authority given to departments to handle publication of their own generated information.

11.22 The Team welcomes the moves towards liberalisation announced in the White Paper. However, the lack of a consistent approach across Government places unnecessary burdens on publishers wishing to resell Government data. While the concerns mentioned above are valid, and rule out approaches such as full abolition of Crown

copyright as desired by some in industry, the team advocates a much more liberalised system which would reduce bureaucracy while still addressing the core concerns. It is recommended that the Government should extend its dialogue with the private sector over use of the evolving Crown copyright management system with a view to widening the adoption of a class licensing system covering anyone who republishes Crown copyright information. The class licensing system should:

- set out the acceptable quality framework governing private sector republication of any Crown copyright material;
- impose an obligation on departments to supply publishers with the data behind Government publications; and
- enable the Government to withdraw authorisation from any publisher who breaches the terms of the class licence (thus meeting the concerns about data integrity).

11.23 Anyone holding a class licence would be able to publish any Government information covered by that licence, providing the agreed conditions of publication were met. More work will also need to be done to determine the level of charges for class licences, and how the class licences will be administered as part of the evolving Crown copyright management system.



#### CROWN COPYRIGHT WHITE PAPER

This set out a framework for waiving Crown Copyright over large segments of Government information.

The Government made a firm commitment to provide greater transparency in relation to the range of government information which is available. The creation of a new cross-government Information Asset Register listing the information holdings held at each department and the arrangements for access will help achieve this aim.

Direct income from licensing Crown copyright protected information was estimated at around £200m in 1996-97

*Box 11.8*

<sup>7</sup> The Future Management of Crown Copyright. Cm4300

## 12. MONITORING AND EVALUATING E-COMMERCE

### SUMMARY

12.1 The Government's stated objective is to make the UK "the world's best place to trade electronically by 2002". To achieve this objective, it is essential that a framework is established to first define e-commerce and then to:

- allow direct monitoring of the growth and diffusion of e-commerce activities across the economy and determine the extent to which the UK is the best environment for e-commerce; and
- allow evaluation of the net overall impacts of e-commerce on the economy.

12.2 This chapter details the suggested framework, the tools and definitions needed to monitor and evaluate e-commerce and provides background and analysis to support the main recommendations:

- Recommendation 12.1: produce an annual "state of e-commerce" report.
- As input into this report, the following recommendations must be adopted to monitor e-commerce:
  - Recommendation 12.2: develop and pilot changes to the industry classifications used in official UK statistics;
  - Recommendation 12.3: develop and pilot changes to existing tools for gathering business statistics;
  - Recommendation 12.4: scope the potential for the Internet itself to be used to monitor e-commerce;
  - Recommendation 12.5: commission new e-commerce market research; and

- Recommendation 12.6: UK to take a lead internationally to achieve comparable statistics across countries.
- Further input must include progress against recommendations to evaluate the overall impacts of e-commerce effectively:
  - Recommendation 12.7: commission a methodological framework for evaluating the overall net impact of e-commerce by end 1999; and
  - Recommendation 12.8: commission a formal evaluation of the overall net impacts of e-commerce, starting 2002, and at 3-yearly intervals thereafter.

### BACKGROUND AND DEFINITIONS

12.3 Without an agreed definition of e-commerce, there is an increasing risk that the UK will not correctly track retail sales made across the Internet, particularly from outside the EU. Failure to recognise these could eventually mean that the UK economy appeared to be in recession, based on falling recorded retail sales, when in reality it was growing, but a significant percentage of sales went unrecorded. At present there is no generally agreed single definition of e-commerce. Much of what Governments describe as e-commerce is recognised by Industry as e-business. Some examples of definitions are illustrated in box 12.1

12.4 The PIU Team's definition of e-commerce was given in chapter 3. This was a deliberately broad definition,

**EXAMPLES OF THE DIVERSE DEFINITIONS OF 'ELECTRONIC COMMERCE'**

- *UK Department of Trade & Industry (UKDTI)* – ‘net benefit’ publication “using an electronic network to simplify and speed up all stages of the business process, from design and making to buying selling and delivery”;
- *The Alliance for Electronic Business* – “the exchange of value across networks”;
- *Internet.com* – “the process of two or more parties making business transactions via a computer or some kind of network”; and
- *Marks & Spencer Ltd* – “the exchange of value between a customer and merchant (over the Internet) in exchange for goods and services”.

Box 12.1

seeking to capture the wide impacts which e-commerce can have on all aspects of business and society. More narrow definitions are also needed to make a distinction between process e-commerce and transactional e-commerce:

- Process e-commerce covers business-to-business activity for intermediate goods and a wide variety of process information. It has been in use for more than ten years in Europe, largely under the guise of Electronic Data Interchange (EDI). It is closely associated with the Computer Assisted Logistics process and has already brought about major reductions in cost and improvements in quality/time to market, particularly in manufacturing industry.
- Transactional electronic commerce covers both business-to-consumer and business-to-business activity for final products and services. It is taken to mean the sale of goods or services over electronic networks, at any stage in the supply chain, whether between businesses, between

businesses and consumers, or between the public and private sectors. The sale is transacted electronically, but ultimate delivery of the good or service may be conducted on or off-line.

12.5 Using agreed definitions of e-commerce, there are two requirements for capturing data on it. The first is to establish whether the UK is meeting its stated objectives. The second is to track overall economic change and thus the ability to manage the macro-economy (ICT industries are argued to have brought down overall inflation in the US by 0.7% in 1996 and 1997<sup>1</sup>).

12.6 However, the UK has no clear framework for monitoring or evaluating e-commerce. Therefore, measures are proposed (see figure 12.1) that will enable:

- Monitoring of the growth and diffusion of e-commerce activities:
  - “Best environment” measures: to show how successful the UK is at putting in place the underlying

**FRAMEWORK FOR MONITORING E-COMMERCE**

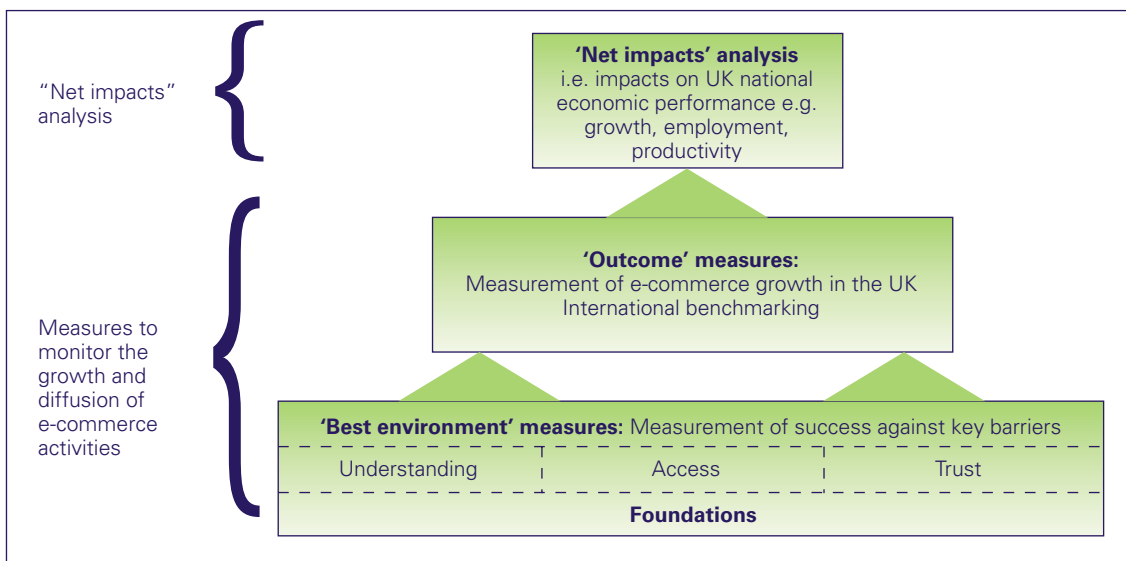


Figure 12.1

<sup>1</sup> *Emerging Digital Economy 2*, US Department of Commerce



foundations for e-commerce (a competitive and innovative environment and an internationally agreed tax and regulatory framework); addressing the key barriers to take-up of e-commerce within the pillars of understanding, access and trust.

- “Outcome” measures: to quantify the growth of e-commerce in the UK.
- Evaluation of the overall impact of e-commerce on UK national economic performance (output, growth, productivity, employment etc.).

12.7 A number of existing statistical tools are available. These include:

- current industry classifications (International, European and for EU member states), which underpin the tools below (see box 12.2);
- tools for gathering statistics from business, such as the Annual Business Inquiry, which asks 75,000 businesses, of which 8,000 are retailers, for basic business data and allows calculation of sales, employment, value-added data etc., by sector (see box 12.3);
- tools for gathering statistics from consumers, such as using the Family Expenditure Survey, a continuous annual survey of family expenditure and income across the UK, asking respondents to keep a diary of their spend;

- market research, such as the DTI-commissioned Spectrum Consulting research, which monitors business attitudes and uptake through sectoral, regional and international benchmarking surveys (see box 12.4); and
- sectoral impact assessment studies, such as the retail financial services and telecoms studies initiated by the PIU, referred to in chapter eight and detailed in Appendix three.

12.8 Officials within the UK Government and international organisations such as the OECD,<sup>2</sup> are currently engaged in discussions about how e-commerce should be defined to enable effective measurement and to facilitate international comparisons. However, we believe that at least two definitions will be needed (as stated in chapter three). The most appropriate definition will depend on the purpose and method of monitoring. The narrower definition will be more practical for monitoring via regular business surveys. The broader definition is more suitable for the evaluation of impacts and for supporting sectoral impact assessments.

#### CURRENT INDUSTRY CLASSIFICATIONS

International classifications: ISIC (International Standard Industrial Classification)

- Approved by the Statistical Commission of the United Nations.
- As with other classifications, revisions are generally made approximately every ten years, to lend a degree of stability to collection and to permit the compilation of comparable time series data.

European classifications: NACE (Nomenclature générale des Activités économique dans les Communautés Européennes)

- Adopted by Eurostat.
- The lowest level of disaggregation in NACE is the 4-digit class.
- The current version of NACE was devised in the late 1980s and is consistent with the current ISIC.

Classifications for EU member states

- All EU Member States have their own industrial classifications, each of which must conform with NACE down to the 4-digit level.
- However, each Member State is able to adopt a version of NACE for its own national statistics which incorporates where necessary or helpful a fifth digit to form subclasses of selected 4-digit classes.
- The UK's version of NACE has many such subclasses and is known as SIC92.

Box 12.2

<sup>2</sup> For example, the OECD workshop, 21 April 1999: “Defining and Measuring E-commerce”, organised by the ICCP Division of the Directorate of Science, Technology and Industry.

## CURRENT TOOLS FOR GATHERING STATISTICS FROM BUSINESS

### The Annual Business Inquiry (ABI)

- 75,000 businesses asked for basic business data.
- Allows sales, employment, value added etc. to be calculated in each SIC classification.

### Prodcom

- Manufacturing businesses asked for detailed product sales.
- Better equipped than ABI to tackle coding problems for infrastructure businesses, as it deals with products in fine detail.
- There is currently no equivalent to Prodcom for service sectors.

### The Business & Enterprise R&D survey (BERD)

- Captures research and development data.
- Based on returns from 1,600 businesses.

### The Producer Price Inquiry

- Measures price movements of manufactured goods.

### Overseas Trade Statistics (HM Customs and Excise)

- Captures import and export of goods.

Box 12.3

## EXAMPLE MARKET RESEARCH FUNDED BY GOVERNMENT

### Spectrum Strategy Consultants (DTI)

- Covers business monitoring.
- Most recent publications include a 'Regional Benchmarking Study', 'Sectoral Benchmarking Study', and 'International Benchmarking Study', published in 1999.

### NOP survey of Internet Use (COI)

- Bi-annual survey of Internet users.
- Provides a demographic profile of the Internet user in Great Britain, examining behavioural patterns and attitudes, to monitor usage and attitudinal data, to build a panel of users and to provide tracking and measurement of other media.
- Fieldwork was carried out in 1998; data is now available to Government.

### PFA Research (DTI)

- Conducted across a number of European countries.
- PFA is a UK-based company which has been conducting research into EDI usage and more recently, electronic commerce across a large number of European countries.
- DTI has been subscribing to the service and agreed to co-sponsor a new survey in 1998, mainly focusing on business-to-business e-commerce market and revenue potential.
- Its key objective is to understand the activities and intentions of larger companies towards trading web-sites.
- The target population is businesses employing 100 people or more, with a sample size of 1400 across seven countries.

### IT for All Survey

### View from the Queue (CITU)

Box 12.4

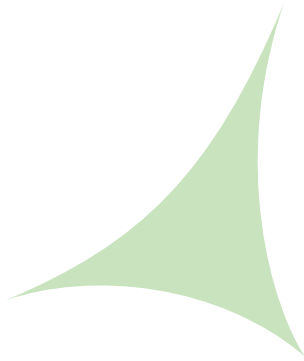
## RECOMMENDATIONS AND ANALYSIS

12.9 The following recommendations are proposed to enable monitoring and evaluation of the impact of e-commerce within the framework described above. Within the UK, these recommendations have been developed in conjunction with ONS, the DTI and Treasury. At an international

level, recommendations are broadly consistent with emerging recommendations from the OECD and other countries.

Recommendation 12.1: produce an annual "state of e-commerce" report

12.10 The UK has no existing way of co-ordinating the reporting of its activities relating to e-commerce. Therefore, an annual



“state of e-commerce” year-on-year, benchmarked report should be produced by the e-envoy (chapter fourteen) as a focus for political efforts to raise the profile of e-commerce.

12.11 The report should analyse progress towards making the UK the best place to do e-commerce, update strategy where necessary, set out targets and assign roles and responsibilities for the next year. Progress should also be reported on:

- changes to UK industry classifications, tools for gathering statistics from business, and market research; and
- evaluating, as far as possible, the overall net impacts of e-commerce – bearing in mind the problems of quantifying the effects of job displacement and spillovers.

12.12 Clear indicators are needed to test whether progress is being made towards making the UK the best place to do e-commerce. These indicators should be kept to a minimum but should include those outlined within the “vision”. More detailed measures will also be needed to check progress against specific “best place” measures. These are detailed in box 12.5 later in this chapter. The first annual report should coincide with the usual timing of the publication of the DTI’s business benchmarking data, around June/ July 2000.

## RECOMMENDATIONS TO MONITOR E-COMMERCE

12.13 Recommendations to monitor e-commerce cover the following:

- *Infrastructure businesses*: i.e. businesses involved in the development of hardware (PCs, routers, servers etc.), network service providers (e.g. Internet access), software and enabling services (e-payment, delivery, authentication etc.), which have been major areas of e-commerce growth to-date.
- *Businesses which trade electronically*.
- *Consumer imports and exports*: in order to verify business figures and ensure that electronic consumer purchases from other countries are captured, it is necessary to know how much consumers are buying electronically and what proportion of these purchases is being made from UK

producers rather than imports. We also need to be aware of the trade balance in e-commerce and must therefore have some measure of electronic exports.

- *The public sector*: it is necessary to understand the extent to which Government is using e-commerce and therefore acting as exemplar.

Recommendation 12.2: develop and pilot changes to the industry classifications used in official UK statistics

12.14 Existing industry classifications are the basis for all national statistics and their contributing surveys (as stated in paragraph 12.5 and detailed in box 12.2). And ONS are in the early stages of work to compile a monthly index of services output. This must be co-ordinated with other schemes which have limitations for monitoring e-commerce:

- The current *manufacturing* 4 digit codes for both manufacturing and service sectors do not properly reflect the recent changes in information-based industries and would benefit from re-thinking. Most EU member states have indicated that they do not wish to see a major revision to NACE (the European classification) until 2007.
- There is little disaggregation of *service* sectors, needed to capture service infrastructure areas such as software etc.
- Comparisons cannot currently be made with the US as although 4-digit codes are aligned across Europe, they are not consistent with the US and Canada. The US are currently looking at their classification from an information technology perspective and have recently introduced a new North American Industrial Classification System (NAICS), which they are using as a basis for collecting data.

12.15 In the ICT sector (which covers the infrastructure businesses), the DTI have developed proposals for new UK-only 5-digit SIC codes (see box 12.5). These have yet to be tested for feasibility with the ONS Business Register and with UK business. This should be done quickly, with a view to new codes being adopted by the UK within the next year. Similar codes should be developed for the content and digital media industry.

PROPOSED DTI ADDITIONS TO SIC CODES  
THE ICT SECTOR

Existing UK ICT SIC92 code

DTI proposals

30.00 Manufacture office machinery and computers

- 30.02 Manufacture of computers and other information processing equipment
  - 30.02/1 manufacture of computers
  - 30.02/2 manufacture of peripherals

31.30 Manufacture of insulated wire and cable

- 32.10 Manufacture of electronic valves and tubes and other electronic components

32.10 Manufacture of electronic valves and tubes and other electronic components

- 32.10/1 manufacture of semi-conductors
- 32.10/2 manufacture of cathode ray tubes and other tubes and valves
- 32.10/3 manufacture of liquid crystal displays and other flat panel displays
- 32.10/4 manufacture of sensors and actuators
- 32.10/5 manufacture of printed circuit boards
- 32.10/6 manufacture of capacitors, resistors and other passive components
- 32.10/7 manufacture of connectors, switches and relays
- 32.10/8 manufacture of optoelectronic components including subassemblies
- 32.10/9 manufacture of other electronic components

32.20 Manufacture of TV and radio transmitters and telephone apparatus

32.30 Manufacture of TV and radio receivers and other consumer electronic goods

33.20 Manufacture of instrumentation

- 72.20 Software consultancy and supply split into:
  - 72.20/1 development, production and supply of custom software products
  - 72.20/2 development, production and supply of application software packages
  - 72.20/3 development, production and supply of application enabling tools
  - 72.20/4 development, production and supply of system level software
  - 72.20/5 development, production and supply of internet software
  - 72.20/6 other software activities not elsewhere specified

33.30 Manufacture of industrial process control equipment

51.43, 51.64, 51.65 Wholesale of ICT equipment and supplies

71.33 Renting of office machinery and equipment, including computers

64.20 Telecommunications

- 72.40 Database activities, to be split into:
  - 72.40/1 aggregation of data/content from a range of sources
  - 72.40/2 other database activities

72.00 Computer software and services

Box 12.5

12.16 In the meantime, data on the size and growth of e-commerce-related infrastructure businesses should be constructed from present SIC codes. Although the resulting definition would have shortcomings because of the limitations outlined above, it would provide sales, output, employment and capital expenditure data, back to 1992/3, based on the Annual Business Inquiry.

12.17 For service industries (e.g. software), specific service areas should be split out in the ONS' Annual Business Inquiry. This would require agreement over which splits made most sense. The DTI and ONS, together with business, should agree on the most appropriate splits in time for the first "State of e-commerce" report.

Recommendation 12.3: develop and pilot changes to existing tools for gathering business statistics

12.18 Currently, none of the existing tools for gathering business statistics split electronic from non-electronic activities or enable international benchmarking (although most countries conduct similar surveys).

12.19 The Government should aim for an electronic/non-electronic split of sales in its Annual Business Inquiry and Business Enterprise R&D survey (BERD, which captures research and development expenditure). Sales data are sought as business is unlikely to be able to breakdown measures such as employment between traditional and e-commerce activities, since employees will often be engaged in both. The following steps should be taken by the first "State of E-commerce" report:

- clear definitions of e-commerce and the scope of the questions to be agreed within government and with business. It is possible that the scope should initially be limited to those sectors where e-commerce is already having significant impact in order to limit compliance costs;
- collection and compliance costs (to business) must be estimated (adding questions in some sources, such as the ABI, will increase the burden on business and therefore any additions may need to be balanced by the removal of existing questions); and

- as with all recommendations, pilot data collection must be carried out across sample businesses.

12.20 The Family Expenditure Survey (FES), which monitors consumer purchases, has a relatively small sample size (~6,500 households in the UK), and a falling number of respondents. In addition, it does not split out domestically produced purchases from imports. Therefore, it is recommended that consumer statistics are picked up in the market research detailed in recommendation 12.5 below rather than through changes to the FES.

Recommendation 12.4: scope the potential for the Internet itself to be used to monitor e-commerce

12.21 In addition to using existing tools to monitor e-commerce, there is potential for the technology underpinning e-commerce itself to be used to monitor uptake (in a similar way to TV audience monitoring). This is not currently being explored in the UK. Discussions need to be initiated with IT technology suppliers, covering all e-commerce channels (e.g. PC, DTV etc.) and the potential for "self-monitoring" should be scoped in time for discussion within the first "State of e-commerce" report.

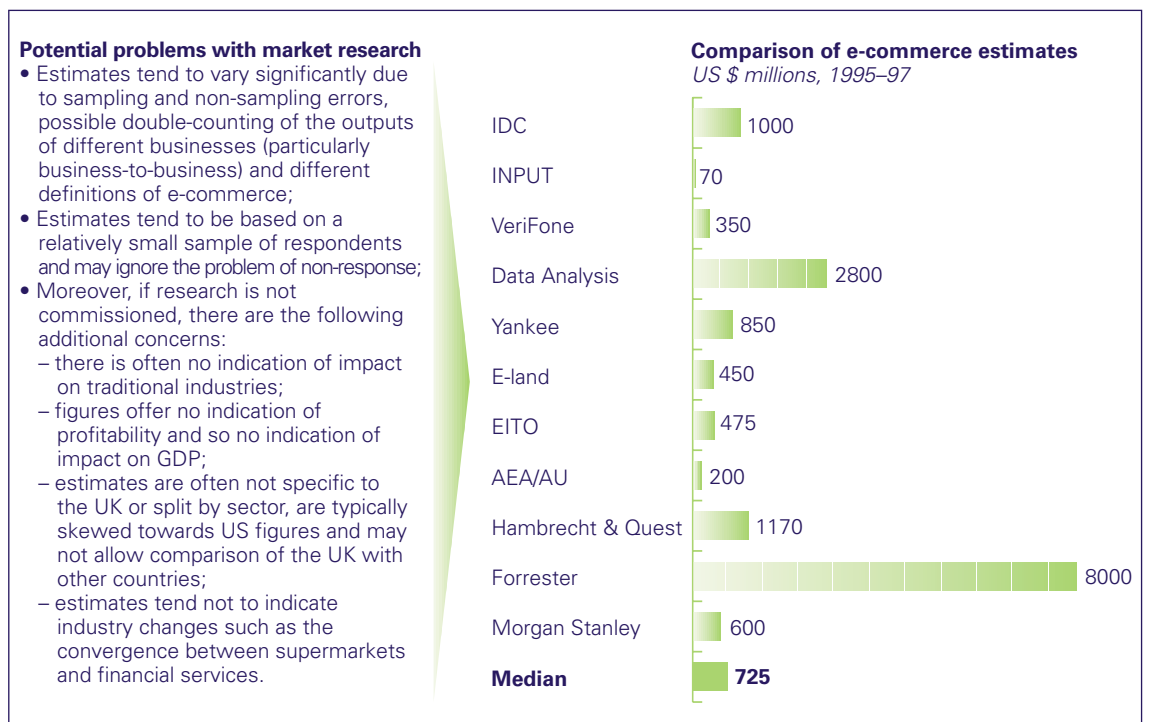
12.22 Any scoping document should be developed in conjunction with consumer associations and should include acceptable solutions to any privacy concerns, for example, by using an "opt-in" scheme, although this could introduce a selection bias in the monitoring process.

Recommendation 12.5: commission new e-commerce market research

12.23 Market research statistics offer an alternative to national statistics. Although they are not an ideal long-term measurement tool (as noted by the OECD in their recent paper,<sup>3</sup> see figure 12.2), they can be assembled quickly. Market research is already used extensively by the UK Government to monitor e-commerce (see box 12.4), but benchmarked data are business-focused and do not cover enabling businesses or the public sector. Consumer data are only available on a national basis.

12.24 Therefore, current market research needs extending to cover enabling businesses and the public sector and needs to be internationally benchmarked to enable Government to monitor e-commerce in the short-term while other recommendations are being implemented. The research will also assist the ultimate evaluation of the overall net impacts of e-commerce.

#### ISSUES WITH MARKET RESEARCH



Source: OECD: *The Economic and Social Impacts of E-commerce*, Chapter Three

Figure 12.2

<sup>3</sup> The Economic and Social Impacts of E-commerce

## IDEAL "BEST ENVIRONMENT" MEASURES

To establish the foundations for e-commerce:

- inward investment by overseas e-commerce businesses (£m);
- new e-business start-ups: the total number of start-ups and as a percentage of all new business start-ups in, (a), user industries and, (b), enabling industries;
- venture capital subscribed to e-businesses (£m) and as a percentage of all venture capital;
- labour market flexibility.
- availability of suitable skills.

To ensure access to infrastructure and social inclusion:

- Costs
  - the costs of Internet use for businesses and consumers: PC prices (£ per machine), telecommunications charges (fixed £ per quarter and variable £ per hour), ISP charges (split between telecoms fixed charges and ISP charges) and the cost of producing a Web site. If possible lower and upper quartile of range of costs in each country are needed, as well as the median, to give some idea of the range of potential costs which businesses and consumers face;
  - the percentage of (a), consumers and, (b), businesses who perceive the following as a barrier to access/use: cost (PCs, telecommunications charges, other), poor reliability/slow speed of connections, lack of broadband access, lack of skills, other.
- Technology
  - the number and percentage of individuals/households, businesses and public sector with: (a) a PC; (b) a PC and a modem (both with & without Internet access); and (c) interactive digital TV – in their home; by socio-economic group, age and sex;
  - for businesses/public sector, by sector/Department and size of firm;
  - the number and percentage of individuals and businesses with access via the following: standard fixed line, ISDN, ADSL, radio fixed access, mobile, mobile UMTS, interactive digital TV or leased lines; and
  - of those with Internet access: (1) the percentage breakdown of uses between information, e-mail, on-line purchasing, on-line sales and other; (2) the typical time spent on-line – (a), in work and, (b), in the home (median, upper quartile, lower quartile).
- Inclusivity
  - the percentage schools, libraries, post offices with Internet access and the number and the percentage of individuals who regularly access the Internet at places outside their home and outside their place of work (e.g. through schools, libraries or other community facilities);
  - the percentage of the population without a bank account and a credit card; and the percentage of the population with problems of, (a), literacy and, (b), numeracy (on standard OECD benchmark measures).

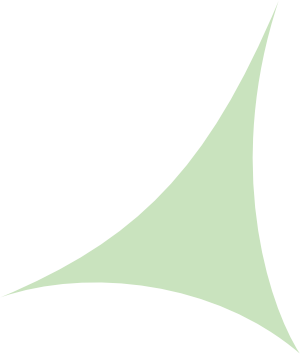
To ensure that users develop an understanding of the opportunities and threats, including monitoring Government as exemplar:

- the perceived benefits and disadvantages of e-commerce over traditional channels (cost savings, increased revenues, none etc.) along with their expected profitability now and in the future. For businesses, these data should be split by CEOs/ board members and middle managers;
- the percentage of businesses who see e-commerce as an important opportunity/threat to their business;
- the percentage of businesses with a strategic plan/strategy for exploiting the opportunities offered by e-commerce and adapting to any threats;
- estimated levels of IT literacy and for business, professional level skills;
- the percentage of Government procurement conducted electronically;
- the percentage of Government departments and agencies available through portals;
- the percentage of MPs with e-mail and web-sites.

To ensure that users trust e-commerce applications:

- the percentage of (a), consumers and, (b), businesses who see the following as barriers to e-commerce: privacy, security, fraud, content liability, IPR, means of redress, other;
- the percentage of consumers concerned about the quality/delivery of goods and services sold over the Internet;
- Internet fraud and illegal content (number of cases). Internet fraud (£m), as a percentage of all e-commerce;
- Percentage of individuals with smartcards

Box 12.6



12.25 Increased use of e-commerce will inevitably mean that there will be an increase in the number of electronic transactions for the public sector (including an increase in the proportion of taxes paid electronically). However, e-commerce sales, benefits to business and the public sector will be optimised if the UK is successful in creating the world's best environment for e-commerce. In order to test whether this is the case, some proxy outcome measures should also be included in surveys. Suggested measures are given in box 12.6.

12.26 To test whether the UK is the "best environment" for e-commerce, the market research surveys should include all "key outcome and net impact measures" described in box 12.7.

12.27 In the short-term, a scoping study should immediately be commissioned by the e-envoy (chapter fourteen) to establish what data are currently available, where the gaps are and how they could be filled (it is likely to rely on telephone and personal interview surveys to gather data). This should be reported in the first annual e-commerce review.

12.28 All surveys should have a broad geographical coverage. They should aim, as far as possible, to cover the major developed economies and countries at the forefront of, or likely to play a key role in, the growth of e-commerce. Such countries include the G7 countries, the Scandinavian countries (Sweden, Norway, Denmark and Finland), Australia and Singapore/Malaysia/Hong Kong/South Korea.

12.29 Subsequent to the scoping study, all market research should be coordinated by the central e-envoy (see chapter fourteen). All questions should be aligned with emerging OECD research.

Recommendation 12.6: UK to take a lead internationally to achieve comparable statistics across countries.

12.30 The UK should aim for a review of SIC codes at an International level at the earliest opportunity to allow comparisons to be made between the UK and other countries. In particular, it should seek EU agreement to a significantly shorter deadline for reviewing European classifications than the current

**KEY "OUTCOME" AND NET IMPACT" MEASURES**

**Source of data**

**Ideal measurements**

Outcome measures

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Infrastructure businesses</li> <br/> <li>• Businesses which trade electronically</li> <br/> <li>• Consumer purchases</li> <br/> <li>• Public sector</li> </ul> | <ul style="list-style-type: none"> <li>• sales and output (£m);</li> <li>• value added (£m);</li> <li>• employment/self-employment ('000);</li> <li>• capital expenditure (£m);</li> <li>• R&amp;D spending (£m);</li> <li>• labour productivity</li> <br/> <li>• total volume of business conducted electronically – £m sales and £m output;</li> <li>• profitability of e-businesses compared to other sectors;</li> <li>• business investment in hardware/software (additional rather than replacement).</li> <br/> <li>• total volume of purchases made electronically, split between domestic sales and imports.</li> <br/> <li>• proportion of routine Government transactions handled electronically;</li> <li>• proportion of businesses paying tax over the Internet;</li> <li>• proportion of all taxes paid electronically.</li> </ul> |
|---|---|

Net impact measures

- % businesses which have found e-commerce has reduced costs/raised productivity, reduced/increased employment levels, improved product quality, improved customer service;
- % consumers who have found e-commerce has lowered the prices they pay, improved product quality, improved customer service, reduced the time spent shopping, with resulting savings;
- % growth in productivity of businesses adopting e-commerce.

Box 12.7

target of 2007. In addition, the possibilities for informal change – which may be capable of implementation earlier than 2007 – should be actively explored.

12.31 The UK must also ensure that the EU Structural Business Statistics Regulation (which dictates what should be collected in the ABI) is reconsidered as soon as possible. There may be some early opportunities as the EU is considering information technologies in its current update.

## RECOMMENDATIONS TO EVALUATE THE IMPACT OF E-COMMERCE

12.32 The net overall impact of e-commerce on the UK economy could be very significant. Any analysis of this impact on the macro-economy is necessarily qualitative rather than quantitative because:

- there will be both positive and negative effects and the magnitude of the net impact is highly uncertain;
- there are numerous conceptual and practical difficulties associated with measuring the economy-wide impacts of e-commerce; and
- the growth of e-commerce is in its infancy and there is little firm evidence on which to base conclusions about its likely macro-economic impact.

12.33 However, it is possible to point to some concrete effects e-commerce is likely to have, as set out in figure 12.3. These include macro-economic effects on:

- **productivity** – e-commerce should increase the efficiency of doing business, thereby increasing economy-wide labour and capital productivity (but see box 12.8);

- **cost and price inflation** – increases in efficiency brought about by e-commerce should drive down costs. Provided markets are competitive, lower costs will be passed on to consumers in lower prices.

E-commerce should also raise the intensity of competition by improving price transparency, reducing the geographical segmentation of markets and increasing new entry competition;

- **employment** – although there will be positive and negative effects on employment in the short term, the long-term prospects are net employment gains brought about by new opportunities for existing industries, the emergence of completely new e-commerce based industries and a rise in living standards due to the increased real incomes generated by e-commerce;

- **investment** – e-commerce should make it easier for businesses to forecast demand and thus to manage their stocks and inventories. This will reduce aggregate levels of investment in stocks and inventories. In the short term, this could have negative effects on national income but in the medium to long term there will be gains from having to devote fewer resources to storing and managing stocks and inventories;

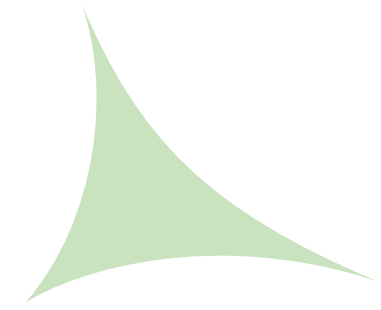
- **international trade** – the UK, like other countries, may be expected to see some rise in both exports and imports in relation to national income. This could lead to increased demand for additional investment in transport infrastructure; and

- **impacts on the demand for inputs** – there is likely to be increased demand for IT professionals, particularly those with business application skills, as a result of e-commerce. Their wages and salaries could rise sharply as a consequence. Similarly the need for new distribution

### DOES E-COMMERCE IMPROVE PRODUCTIVITY?

This is an issue of considerable controversy amongst economists. See, for example, the article on “The New Economy” in the *The Economist* 24 July 1999. It is pointed out, for example, that the rapid adoption of information and communications technology from the mid-1970s onwards was accompanied by a *slowdown* in labour and capital productivity growth in most developed countries. This led the Nobel-prize winning economist, Robert Solow, to observe in 1987 that “you can see the computer age everywhere but in the productivity statistics”. The reasons for this may include the substitution of investment in information and communications technology for other types of capital and learning effects. These may mean that it takes time for businesses to realise the full benefit of new technologies.

Box 12.8



## IMPACT OF E-COMMERCE ON THE MACRO ECONOMY

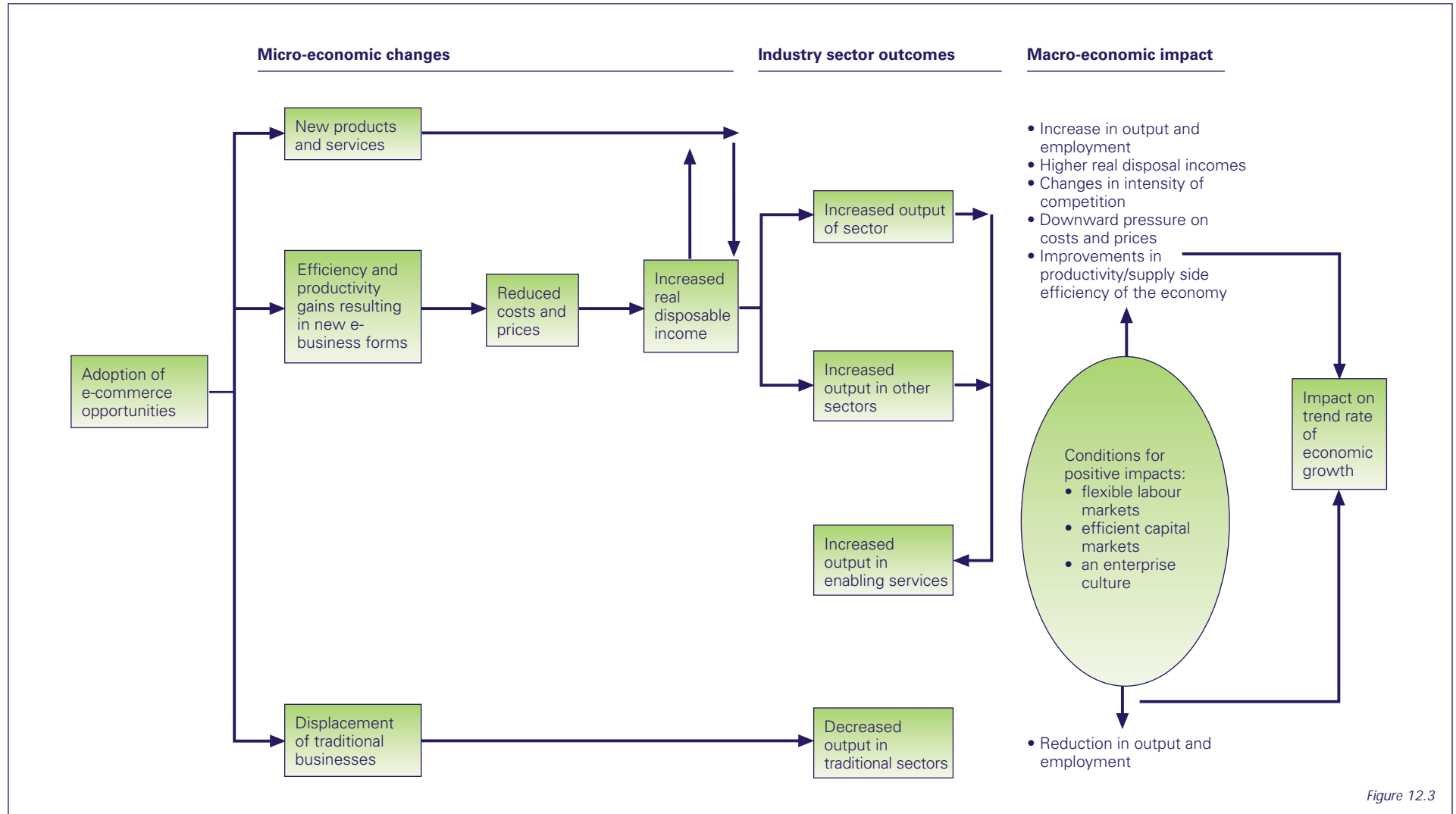


Figure 12.3

centres may push up land and property prices in some parts of the country (though these may be offset by falls in the price of traditional retail property etc.).

12.34 As well as taking actions to put direct measures in place, the Government needs to use statistics on the impacts outlined above to evaluate the overall, net impact of e-commerce on all aspects of UK national economic performance, including output, growth, productivity, employment, income and expenditure.

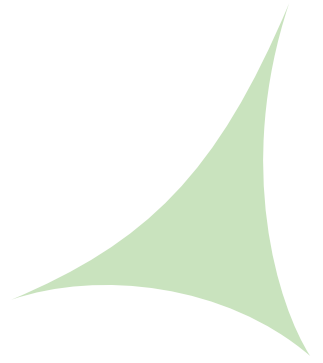
Recommendation 12.7: commission a methodological framework for evaluating the overall net impacts of e-commerce by end 1999

12.35 The DTI, supported by the Treasury and ONS, should commission a framework for evaluating the overall net impacts of e-commerce by end 1999, drawing on any experience in the US.

Recommendation 12.8: commission a formal evaluation of the overall net impacts of e-commerce, starting 2002, and at 3 yearly intervals thereafter.

12.36 Once the methodological framework is agreed, the DTI should commission an evaluation as a piece of independent, external commissioned research. It is likely that a large part of the evaluation will have to be in the form of case studies. These should be co-ordinated within recommendation 8.2: carry out and communicate shared industry/Government sector-specific "e-commerce impact assessments" to highlight the opportunities, threats and barriers in each sector.

12.37 The results of the evaluation should feed into the annual "state of e-commerce review" described in recommendation 12.1.



## 13. ACTIONS BY THE DEVOLVED ADMINISTRATIONS

### INTRODUCTION

13.1 The Information Society Initiative extends throughout the UK, and Scotland, Wales and Northern Ireland each have their own programmes to drive the take-up of e-commerce. The PIU Team was highly impressed by the quality of these programmes and the enthusiasm it found for that implementation. Below is a short summary of the main activity underway outside England.

### SCOTLAND

13.2 In Scotland, the Scottish Executive's Enterprise and Lifelong Learning Department, along with Scottish Enterprise and Highlands and Islands Enterprise, provides help and encouragement to Scottish business to exploit the opportunities of the information age.

13.3 A nation-wide network of 12 Local Support Centres has been set up to assist local business with all their information and communication technology needs, providing impartial advice tailored to companies' individual requirements.

13.4 Scottish Enterprise is the economic development agency for lowland Scotland covering 93% of the Scottish population from Grampian to the Borders. The e-commerce team within Scottish Enterprise is responsible for a number of integrated programmes and projects aimed at accelerating the development and usage of e-commerce through the Internet and related technologies.

13.5 The team has several activities to support the growth of an internationally

robust e-commerce supply sector. These include:

- a Winners at the Web competition, rewarding companies throughout Scotland which achieve tangible business benefits through the use of Internet or Intranet technologies;
- the ICT Solutions for Business programme, involving the e-commerce team and nine LECs – Dunbartonshire, Ayrshire, Fife, Forth Valley, Glasgow, Grampian, Lanarkshire, Renfrewshire, and Tayside. The programme, which receives EU funding, is midway through its activities and has so far assisted over 120 SMEs in lowland Scotland by the provision of impartial and independent advice on ICT strategy and implementation;
- an E-Commerce Roadshow planned for autumn 1999, designed to inform a large number of SMEs about the benefits of e-commerce and to persuade them to embrace these systems;
- seminars and conferences, organised by the e-commerce team in partnership with the Local Enterprise Company network, Highlands and Islands Enterprise and other partners; and
- banner projects the e-commerce team encourages the development of practical, multi-partner projects, which demonstrate the benefits to business of integrating e-commerce strategies within their companies.

13.6 Scottish Enterprise is currently working on the development of an e-commerce strategy for Scotland. Further information on the work of Scottish Enterprise's e-commerce

team can be found at <http://www.ecommerce-scotland.org>.

13.7 As well as working with Scottish Enterprise as above, Highlands and Islands Enterprise is looking at e-commerce particularly for its potential to benefit peripheral areas.

## WALES

13.8 The Welsh Information Society initiative is taken forward by the National Assembly for Wales, the Welsh Development Agency and the Development Board for Rural Wales, supported by the European Commission. A strategy and action plan document has been produced covering a vision of an all Wales 'Information Society' incorporating:

- 'Transforming Wales';
- 'Transforming Welsh Business';
- 'Transforming Education and Training'; and
- 'Transforming Public Services'.

13.9 Projects underway include:

- The Lywybr Pathway project to ensure that people and businesses in rural Wales are in a position to reap the benefits of the Information Society, including:
  - supporting a geographical spread of technically appropriate access points;
  - ensuring cost-effective, high quality access to a shared regional network/intranet; and
  - raising awareness of the Information Society.
- Business Connect IT Support Centres – eight main Business Connect IT Support Centres throughout Wales, with associated satellite centres provide expert independent advice on ICT issues and opportunities for small businesses.
- 'Joint Initiatives for Government Services Around Wales' (JIGSAW) – a National Assembly for Wales project with three strands:
  - improving administration of Common Agricultural Policy payments to farmers in Wales;
  - developing joint working with other public sector organisations in rural

Wales to establish "first stop shops" at the Agricultural Department's network of offices across Wales; and

- Assembly front offices providing access to the Assembly from the Agricultural Department's network of offices across Wales.

13.10 Other Initiatives include:

- E-Commerce Innovation Centre, (eCIC), Cardiff University – is involved in several e-commerce initiatives throughout Wales, with public and private sector partners.
- South Wales E-Commerce Testbed – in conjunction with BT and providing a testbed of 15 SMEs in South Wales to demonstrate how e-commerce can help companies improve their performance and trade.
- Adviser Skills Initiative Pilot – a pan-Wales programme to assess and accredit independent hybrid business/IT advisers for SMEs. This is part of the national ASI scheme.
- Electronic Commerce and EDI Implementation programme – an initiative to provide information, advice and assistance to Welsh businessmen in undertaking EDI and e-commerce developments and implementation. It is sponsored by the Welsh Development Agency.

13.11 Further information on the Information Society Initiative in Wales can be found at <http://www.wis.org.uk>

## NORTHERN IRELAND

13.12 "Strategy 2010", the March 1999 report on Northern Ireland's Economic Development Strategy, identified the ICT revolution as a key priority area, and recommended the establishment of an Information Age Commission reporting directly to the First and Deputy First Minister in the new Northern Ireland Assembly.

13.13 Pending the establishment of the Executive, and to prepare the way for the Commission, an Information Age Initiative has been announced. A top level group, representing a wide range of private and public sector interests, has been formed to develop a strategy framework and



comprehensive action plan aimed at ensuring that Northern Ireland takes maximum advantage of opportunities for e-business.

13.14 The Department of Economic Development is taking the lead in supporting the Information Age Initiative and, through an extensive range of programmes, is encouraging the development of the knowledge driven economy and e-commerce through client companies and sectoral organisations. For example, the Local Enterprise and Development Unit has initiated a Connectivity Programme targeting 1000 small companies to provide them with website access and e-mail facilities. The package also includes an element of training in website development.

13.15 There are a number of major developments underway across the education sectors to enhance the ICT infrastructure, to increase the application of ICT in teaching and learning and to improve the skills of staff and students. For example, the five Education and Library Boards in Northern Ireland have appointed specialist ICT trainers and launched a 'Connecting Teachers' initiative in January 1999. This programme aims to provide teachers and librarians with basic ICT skills. By the end of June 1999, all schools had a trained teacher whose function will be to train his/her colleagues on a cascade model basis.

13.16 Northern Ireland Government departments are actively pursuing knowledge driven economy issues arising from the Competitiveness White Paper and associated initiatives – Modernising Government; Electronic Government and the Information Society.

13.17 Further information on the Information Society Initiative in Northern Ireland can be found at  
<http://www.nics.gov.uk/irtu>

## 14. CO-ORDINATING THE ACTIONS

### SUMMARY

14.1 Chapter four set out the wide range of initiatives already being taken by Government and industry. This report has highlighted the further actions required to complete the foundations for a supportive e-commerce environment and to meet the triple challenge of promoting 'Understanding', 'Access' and 'Trust'. There will be resource and prioritisation implications and considerable scope for public/ private partnership in the implementation of these recommendations. A key theme from both industry and departments has been the need for a stronger focus and better co-ordination in driving forward the Government strategy on the 'Information Age' and 'Knowledge-based Economy'. This applies both in terms of the need for clear political leadership and for more vigorous managerial championship of the issues. This chapter details the Team's main recommendations to achieve this:

- Recommendation 14.1: the Prime Minister should appoint an e-Minister on Information Age issues to provide political co-ordination of activities on e-commerce and e-Government. The e-Minister should work with a network of Ministers, in key departments with lead responsibilities for e-commerce and e-Government policy delivery.
- Recommendation 14.2: the Government should appoint an 'e-envoy' with a wider remit than originally proposed, covering both e-commerce and the IT elements of the Modernising Government White Paper. The e-envoy should be a high-level champion for Information Age

issues across Government, based in the Cabinet Office with a direct line to the Prime Minister.

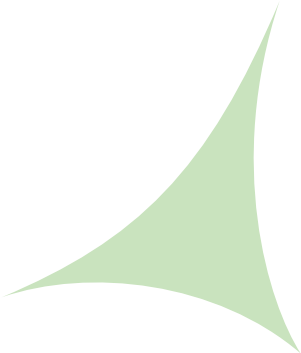
- Recommendation 14.3: as part of the new arrangements to ensure more effective cross-departmental working, an 'Information Age Management Board' should be established, chaired by the e-envoy, bringing together a small core group of departments with major e-commerce and e-Government responsibilities.
- Recommendation 14.4: where these do not already exist, officials should be identified in each major department as 'e-commerce co-ordinators'.
- Recommendation 14.5: the e-Minister and e-envoy should together champion implementation of this report and should maintain a 'living' programme of action in taking forward the overarching strategy.

### THE NEED FOR CO-ORDINATION

14.2 Chapter four established that the UK is substantially behind the USA, Japan, Canada, Australia and Germany in the percentage of the population making regular use of the Internet, either from home or office, and in business use of Electronic Data Interchange (EDI).<sup>1</sup> France is also making up lost ground very rapidly. Two defining features of those major economies ahead of the UK are:

- the way in which they maximise the overall impact of their programmes through careful and detailed co-ordination; and

<sup>1</sup> DTI Spectrum International Benchmarking Study 1999 "Moving into the Information Age"



COUNTRY	CO-ORDINATION MECHANISM
United States	<p>Political sponsor: Al Gore, Vice-President.</p> <p>Co-ordination mechanism: A Federal Task Force, chaired jointly by Vice-President Gore's Chief Domestic Policy Adviser and the White House Deputy Chief Economist. Key departments of State all represented on the task force at senior level. Review meetings held every two weeks.</p>
Australia	<p>Political sponsor: Senator Richard Alston, Minister for Communications Information Technology and the Arts.</p> <p>Co-ordination mechanism: The National Office for the Information Economy (NOIE) driving forward a detailed programme of action across Federal and State Government in close co-operation with Industry.</p>
Canada	<p>Political sponsor: Deputy Minister Kevin Lynch – Industry Canada. Responsible for both e-commerce and e-Government.</p> <p>Co-ordination mechanism: National Information Highway Commission driving forward a detailed programme of action across Federal and Provincial Government in close co-operation with Industry.</p> <p>Electronic Commerce Task Force Director General: Richard Simpson, implementing the strategy published by the Canadian Prime Minister</p>

Box 14.1

- the political and managerial capital and priority they accord to achieving success in e-commerce.

14.3 Details of the co-ordination processes used in USA, Australia and Canada are given in box 14.1.

14.4 This 'Task Force' approach has worked because it ensures continuous attention across Government and an immediate political focus on areas where targets are not being achieved.

"Co-ordination between central Government departments and local Government needs to be strengthened in order to avoid duplication of effort."

*PIU seminar participant*

"A channel strategy requires a clear overarching roadmap for development, and budgets allocated according to business processes (rather than on a departmental basis)."

*PIU seminar participant*

14.5 It is clear that a number of Ministers have given considerable priority to e-commerce and e-Government issues within their departments, for example work at the

Department of Trade and Industry in the Competitiveness White Paper.<sup>2</sup>

14.6 However the work of the PIU project has demonstrated the need to:

- bring together the e-commerce and e-Government strategies, and ensure that the links between them are made in taking forward Government action;
- ensure better co-ordination of cross-departmental activities; and
- provide a stronger political and managerial championship in driving forward the UK's objectives.

14.7 It is clear that other countries seeking to move ahead in the e-commerce race are adopting this approach. For example, through the role of the 'Technical Councillor for Information Technologies and Society' in the French Prime Minister's office.

## RECOMMENDATIONS

Recommendation 14.1: the Prime Minister should appoint an e-Minister on Information Age issues to provide political co-ordination of activities on e-commerce and e-Government. The e-Minister should work with a network of Ministers in key departments with

<sup>2</sup> DTI 1998 White Paper "Our competitive Future: Building the Knowledge-Driven Economy".

lead responsibilities for e-commerce and e-Government policy delivery.

14.8 The e-Minister should report direct to the Prime Minister on Information Age issues. The e-Minister's role would involve political leadership and co-ordination of the range of activities in departments, in particular providing a single point of contact with industry and the media on Information Age issues. Ministerial responsibility for particular policies would remain with the relevant Secretaries of State.

14.9 A number of Ministers in key departments already have lead responsibilities in taking forward e-commerce and e-Government initiatives, in particular the Minister for e-Government in the Cabinet Office. The e-Minister will need to bring together a network of these Information Age Ministers – together with Ministers in other departments who take on such roles – in carrying forward the overall strategy. The e-Minister will need to work particularly closely with the Minister for e-Government through this network.

Recommendation 14.2: the Government should appoint an 'e-envoy' with a wider remit than originally proposed, covering both e-commerce and the IT elements of the Modernising Government White Paper. The e-envoy should be a high-level champion for Information Age issues across Government, based in the Cabinet Office with a direct link to the Prime Minister.

14.10 The appointment of an e-Minister, covering Information Age issues, will help to ensure effective political co-ordination of e-commerce and e-Government activities. This role needs to be buttressed by effective managerial and administrative arrangements in driving forward the Government's modernising objectives.

14.11 To achieve this, the role of the proposed e-envoy should be re-defined. The DTI originally advertised the post of e-envoy in November 1998. The initial view was that the post-holder would focus on e-commerce activities. This remit should be extended so that the e-envoy covers both e-commerce and the IT elements of the Modernising Government White Paper.

14.12 The breadth and importance of the role of the e-envoy, together with the need

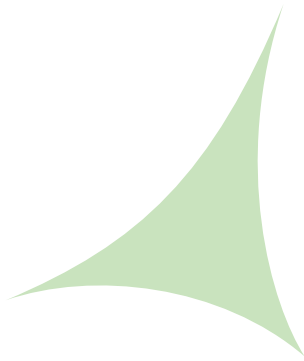
to achieve change across Government and indeed internationally, suggest that the post-holder should have a direct link to the Prime Minister, whilst reporting on a day-to-day basis through the e-Minister and the Minister for e-Government as appropriate. The e-envoy should be located in the Cabinet Office.

14.13 The Team recommends five key themes that should provide the focus for the work of the e-envoy:

- e-business – galvanising UK business, at all levels, to recognise the opportunities and threats implicit in e-commerce. A particular focus on under-performing small and micro enterprises would be essential;
- e-Government – providing strategic input to the development of the Information Age Government agenda set out in the Modernising Government White Paper. Developing synergies between private and public sectors, including the role of Government as an exemplar of the use of e-commerce through its own procurement and as the deliverer of e-Government services at national, regional and local level;
- promoting the UK strategy abroad – providing the consistent drive in taking forward the UK's Information Age objectives in international fora;
- e-inclusion – maintaining the push to ensure that the benefits of e-commerce and e-Government are available to all sections of society, including those with disabilities and the marginalised; and
- programme management – ensuring effective co-ordination of Government activities, including implementation of the full programme of actions recommended by this Report; monitoring progress against the overall objectives for e-commerce and e-Government, keeping strategies under regular and probing review in the light of developments (international, technological, commercial and legal); and identifying key medium-term strategic challenges for the Government arising from new information and communication technologies.

Recommendation 14.3: as part of the new arrangements to ensure more effective cross-departmental working, an 'Information Age Management Board' should be established, chaired by the e-envoy, bringing together a





small core group of departments with major e-commerce and e-Government responsibilities.

14.14 In general the e-envoy should work with other departments in carrying forward the responsibilities set out above. The e-envoy should be a high-level champion for Information Age issues, bringing a strong central drive to the development and implementation of the Government's objectives and effective co-ordination of activities. The e-envoy should have a support team to help deliver these functions, but should not seek to duplicate existing departmental activities.

14.15 To help ensure effective joint working in achieving change, an Information Age Management Board should be established to oversee the programme of work. This Board should be kept small so that it has an effective managerial focus in bringing together the key departments with e-commerce and e-Government responsibilities. The e-envoy should develop these arrangements on appointment, in discussion with relevant departments. Considerations should be given to appointing external, non-executive members to this board, to bring in private sector, wider public sector and consumer group input.

14.16 In addition to the Information Age Management Board, the e-envoy should chair the new Information Age Champions Group (made up of 26 departments, Agencies and the Local Government Association) to ensure a fully coherent and co-ordinated approach right across Government.

14.17 The e-envoy and support team will need to work closely with departments, the wider public sector, industry, trade and consumer bodies in delivering effective programme management. Arrangements will need to be made to ensure that there is continuity in taking forward the recommendations of the PIU project Team, particularly in contributing to an objective assessment of progress in the first annual report on the 'state of e-commerce in the UK' as recommended in chapter twelve.

14.18 It is clear from this report that the e-envoy and support team will need to have, or be able to access, a range of skills and experience covering both the public and

private sectors. It will include, for example, PR skills in taking forward the concerted campaign referred to in chapter eight.

Recommendation 14.4: where these do not already exist, officials should be identified in each major department as 'e-commerce co-ordinators'.

14.19 The e-envoy will also want to consider approaches to developing an effective network of innovators at middle management level in the civil service and wider public sector. It will be vital to develop a cadre middle ranking and senior public servants who share a common vision for the development of e-commerce and e-Government, not constrained by the 'silo thinking' which can sometimes be implied by organisational boundaries. A team of fifteen to twenty officials, from key departments, Agencies and public sector bodies, might be selected and taken swiftly through a facilitated programme of training. In many cases these individuals can already be identified. Their training should develop:

- a strong shared vision for the development of e-commerce and e-Government in the UK;
- ownership of the initial programme of actions recommended in this report; and
- a clear understanding of the detailed implementation responsibilities.

14.20 These officials would remain under departmental line management. They should however be given clear personal responsibilities (and targets) to both lead the agreed change programmes in departments and provide a single point of departmental contact for the e-envoy and support team. They will need to work closely with the more senior departmental 'Information Age Champions' already identified as part of the 'Modernising Government' agenda.

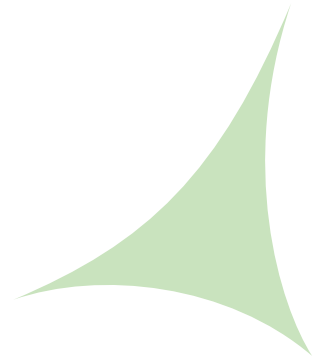
Recommendation 14.5: the e-Minister and e-envoy should together champion implementation of this report and should maintain a 'living' programme of action in taking forward the overarching strategy.

14.21 Key elements would include:

- tracking progress against the milestones and success indicators detailed in this report;
- monitoring the experiences of other countries, learning from their successes and failures;
- using the planned monitoring and evaluation framework (defined in chapter twelve) to identify and then resource the most successful policy initiatives; and
- on behalf of the Prime Minister, adapting the programme in the light of practical experience and evolving international competition.

14.22 In taking forward this role, the e-Minister and e-envoy, in co-ordination with the Minister for e-Government, will need to put in place arrangements for private sector, wider public sector and consumer group input to the development of their work programme. The PIU e-commerce Team has benefited from the high-level Industry involvement in the 'Steering Group' overseeing the project. This Group's role was limited to the duration of the PIU project and it has now been disbanded.

14.23 It will be important to maintain an outward looking focus and the sort of 'joint ownership' which can be achieved through an external Advisory Group as the PIU's recommendations are implemented. The existing "Information Age Partnership", chaired by the Secretary of State for Trade and Industry may be one mechanism to achieve this. The e-Minister and e-envoy will also need to consider whether to establish other sources of external advice.

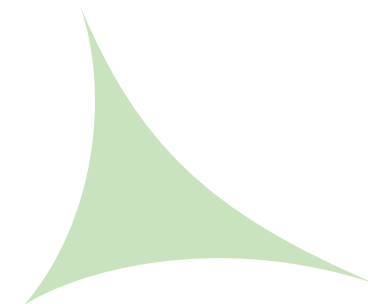


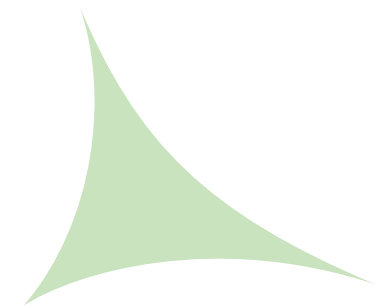
## 15. ACTION PLAN

15.1 This chapter summarises in tabular form the recommendations contained in chapters seven to twelve and fourteen of this report. The table shows the organisations taking lead responsibility for implementation, together with key supporting players. The time-frame for completion of either the entire action or preliminary work on each recommendation is also proposed. It should be noted that the e-Minister and e-envoy have overall responsibility for co-ordinating the actions on all recommendations and championing implementation of the report as a whole.

TABLE LISTING RECOMMENDATIONS, LEAD RESPONSIBILITY, SUPPORT AND TIME-FRAME.

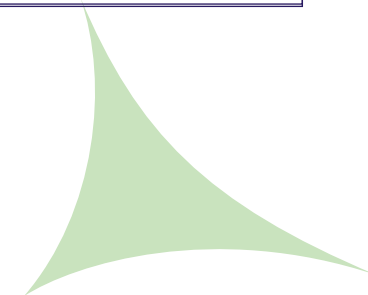
NO.	RECOMMENDATION	LEAD RESPONSIBILITY	IN SUPPORT	BY WHEN...
Chapter 7 Foundations				
1	7.1: OFTEL and OFT should carry out a review to identify any emerging barriers to competition in electronic markets and make recommendations for preventing any such barriers from becoming serious problems.	OFTEL, OFT	DTI, Competition Commission	31 March 2000
2	7.2: DTI should work with industry to map emerging clusters of e-commerce businesses to examine whether their development can be facilitated.	DTI	DETR, HMT, RDAs	31 December 1999
3	7.3: DTI should facilitate an industry-led mentoring/partnering initiative to help new Internet service and content businesses start up and grow	DTI	RDAs, DfEE	31 December 1999
4	7.4: The independent Banking Review, headed by Don Cruickshank, should consider carefully the problems faced by SMEs in obtaining on-line credit-card processing facilities for e-commerce transactions and should recommend action as appropriate	HMT		
5	7.5: The Inland Revenue and Customs and Excise should publish a comprehensive Information Paper in the Autumn (1999) updating the Government's strategy for the tax treatment of e-commerce	Inland Revenue, HMC&E		November 1999
6	7.6: The UK should continue to aim for international agreement on the direct tax treatment of payments for electronic goods and services by end 2000.	Inland Revenue, HMC&E	HMT	31 December 2000
7	7.7: The UK should continue to seek international agreement on the application of the "permanent establishment" principle to Web sites by March 2000.	Inland Revenue, HMC&E	HMT	31 March 2000
8	7.8: The UK should continue to play a leading role in OECD work to review the application of transfer pricing rules to e-commerce and to develop rules for attributing income to permanent establishments.	Inland Revenue	HMT	Ongoing
9	7.9: The UK should identify effective mechanisms for VAT collection in respect of consumer purchases of on-line items from outside the EU	HMC&E	HMT	Ongoing
10	7.10: The tax authorities need to remain vigilant in ensuring e-commerce does not lead to increased tax evasion and avoidance	Inland Revenue, HMC&E	HMT	Ongoing

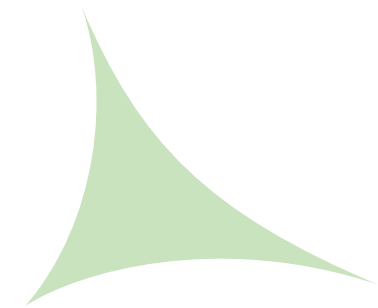




NO.	RECOMMENDATION	LEAD RESPONSIBILITY	IN SUPPORT	BY WHEN...
11	7.11: The UK should work with the EU, the World Customs Organisation and other international bodies to improve and streamline procedures for the collection of VAT and customs duties on small consignments of imports	HMC&E	HMT	31 March 2000
12	7.12: The Inland Revenue and Customs and Excise should publish improved guidance for e-businesses, targeted at small and medium sized enterprises, explaining their tax obligations and how the tax system will treat cross-border transactions.	Inland Revenue, HMC&E	HMT, DTI	November 1999
13	7.13: The UK should continue to play a leading role in the OECD and in other international organisations to achieve an internationally agreed implementation of the framework for the taxation of e-commerce agreed at the 1998 Ottawa Ministerial conference.	Inland Revenue, HMC&E	HMT, DTI	Ongoing
14	7.14: The UK should seek an international examination of the implications of e-commerce betting and gaming for the tax yield from this sector	HMC&E	HO, HMT , DTI, DCMS	Initiated by December 1999
15	7.15: The implications of the convergence of telecommunications, broadcasting and information technologies for regulatory regimes and institutions should continue to be kept under review by DTI and DCMS	DTI, DCMS	OFTTEL, ITC, BBC, RA, Rau	Check point at 30 June 2000*
16	7.16: Regulatory regimes affecting other sectors of the economy need to be reviewed and reformed by the relevant department responsible for each sector to ensure they remain relevant to the changes in industrial and market structure and new business opportunities brought about by e-commerce	All departments & agencies		Preliminary Impact Assessments by 30 June 2000
17	7.17: The UK should promote a co-ordinated and joined-up approach to e-commerce across Europe and globally	DTI	FCO	Ongoing
18	7.18: The UK should continue to push for e-commerce to be fully integrated within the framework of international trade	DTI	FCO, HMT	Within Seattle Round (2003)
Chapter 8: Understanding				
19	8.1: Mount a concerted PR campaign in partnership with industry, to create an e-commerce "buzz" in the UK. Commission research to identify the most appropriate branding to support this campaign.	DTI, e-envoy		Preliminary findings by 30 June 2000*, then Ongoing

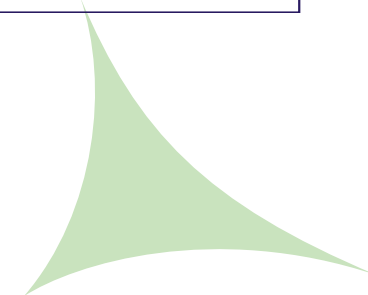
NO.	RECOMMENDATION	LEAD RESPONSIBILITY	IN SUPPORT	BY WHEN...
20	8.2: Carry out and communicate shared industry/Government sector-specific "e-commerce impact assessments" to highlight the opportunities, threats and barriers in each sector, and in particular the audiovisual content industry (linked to recommendation 7.15 above)	All departments & agencies		30 June 2000*
21	8.3: Work with key business influencers to increase boardroom recognition of the strategic challenges of e-commerce;	DTI, e-envoy	Business Organisations	Start by September 1999 Milestone: 30 June 2000*
22	8.4: Develop a multi-channel marketing strategy to influence SMEs/micro businesses	DTI, e-envoy	Business Organisations	Start by September 1999 Milestone: 30 June 2000*
23	8.5: The new English RDAs and devolved authorities should address e-commerce as a priority in their economic development strategies, where they have not already done so.	DETR, RDAs		In step + agreed RDA publication dates. Milestone: 30 June 2000*
24	8.6: Set new National Targets on IT literacy	DfEE	DTI	Define targets end March 2000. 90% school leavers Level 1, 70% Level 2, IT skills by 2002, work force targets set by end 2002
Chapter 9: Access				
25	9.1: Telecommunications operators should be encouraged to offer a wider range of tariff structure options	OFTEL	DTI	Progress by 01 January 2000
26	9.2: Telecommunications operators should be encouraged to explore new commercial interconnect arrangements with BT, allowing more flexible retail tariffs	OFTEL	DTI	Ongoing
27	9.3: OFTEL ensure BT's DSL roll out plans do not give it unfair competitive advantage	OFTEL		OFTEL's timetable: October 1999; December 2000; July 2001
28	9.4: E-Minister/DTI ensure that OFTEL has sufficient resources to meet DSL roll out timetable.	HMT, e-envoy	DTI	October 1999
29	9.5: Better co-ordination and marketing of access initiatives	Inter-Ministerial Group		Milestone: 30 June 2000*
30	9.6: The monitoring of priority excluded groups	DTI	SEU	30 June 2000*
31	9.7: the combination of skills training with the provision of access	Inter-Ministerial Group	DfEE	1 January 2000

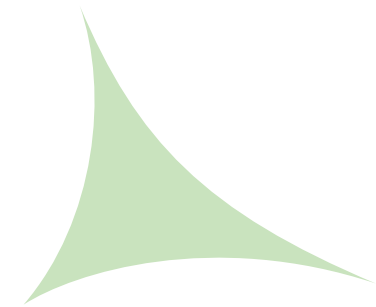




NO.	RECOMMENDATION	LEAD RESPONSIBILITY	IN SUPPORT	BY WHEN...
Chapter 10: Trust				
32	10.1: Implement a national, secure Public Key Infrastructure (PKI) for Government purposes	CITU	OGC, MoD, DoH, e-envoy, CESG	31 March 2000
33	10.2: Ensure that the industry-led TrustUK Hallmark initiative puts in place an Internet disputes arbitration service and a mechanism for policing its standards	DTI	Business Organisations	31 December 1999
34	10.3: Encourage private providers to launch multi-function smartcard schemes for individuals.	CITU	DSS, DoH, DETR, HMT	Publication of framework policy for Government use of smartcards by December 1999
35	10.4: Ensure Government departments quickly take advantage of the equivalence between digital and written documents	All departments		Start August 1999. Identify areas by 31 March 2000
36	10.5: Improve technical capability of law-enforcement and regulators and establish an Internet Crime Unit	HO	HMT, NCIS, SFO, FSA	Start Sept. 1999. Complete July 2000
37	10.6: Build on recommendations in PIU report: 'Encryption and Law Enforcement' on Government/industry co-operation	HO, DTI		Ongoing
38	10.7: the Home Office should re-consider the case for using non-jury trials for serious fraud (including e-commerce fraud)	HO	LCD	March 2000
39	10.8: the Government to encourage the EU to achieve a co-regulatory approach to e-commerce enforcement and redress.	DTI		March 2000
40	10.9: Ensure action is taken to give protection of Intellectual Property Rights (IPR) a higher profile in public understanding and that DCMS work with the creative industries to put in place standards and infrastructure to ensure that content is protected in transmission and that adequate remuneration is received for the exploitation of intellectual property	DTI, e-envoy	DfEE	Ongoing
41	1010: Provide "parents' websites" and encourage software companies to supply free content-filtering software;	DTI	DfEE, HO	30 June 2000*

NO.	RECOMMENDATION	LEAD RESPONSIBILITY	IN SUPPORT	BY WHEN...
Chapter 11: Government as Exemplar				
42	11.1: Publication of departmental performance against targets in electronic procurement	OGC	CITU	September 1999
43	11.2: Campaign to get SMEs more involved in Government procurement	All departments		First review of departments 30 June 2000*
44	11.3: Internationally benchmarking Government e-commerce targets	CITU	DTI	30 June 2000*
45	11.4: Initiating an 'Internet node' programme, enabling transfer of the human and organisational skills that are needed to take advantage of e-commerce, from private- to public-sector senior management	CSSC		First course April 2000
46	11.5: Using the Invest to Save Budget to build alternative Government electronic delivery mechanisms	HMT	CITU,GICS,CISU	First projects started by June 2000
47	11.6: Extending the dialogue with the private sector over use of the evolving Crown copyright management system with a view to widening the adoption of a class licensing system	HMSO	DTI	System set up by December 2000
Chapter 12: Monitoring				
48	12.1: Produce an annual "state of e-commerce" report.	e-envoy	All departments	30 June 2000*
49	12.2: Develop and pilot changes to the industry classifications used in official UK statistics	DTI, ONS		Milestone: 30 June 2000*
50	12.3: Develop and pilot changes to existing tools for gathering business statistics	DTI, ONS		30 June 2000*
51	12.4: Scope the potential for the Internet itself to be used to monitor e-commerce	DTI, ONS		30 June 2000*
52	12.5: Commission new e-commerce market research.	DTI, ONS		Start Sept 1999 Complete 30 June 2000
53	12.6: UK to take a lead in international fora to achieve comparable statistics across countries.	DTI		Start ASAP
54	12.7: Commission a methodological framework for evaluating the overall net impact of e-commerce by end 1999	DTI	HMT	31 December 1999
55	12.8: Commission a formal evaluation of the overall net impacts of e-commerce,	DTI	HMT	30 June 2000*



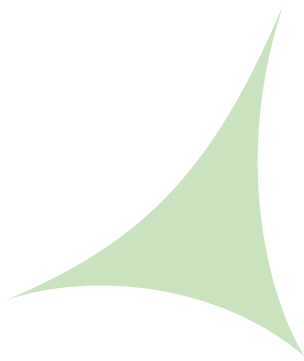


NO.	RECOMMENDATION	LEAD RESPONSIBILITY	IN SUPPORT	BY WHEN...
	starting 2002, and at 3-yearly intervals thereafter.			
Chapter 14: Co-ordination				
56	14.1: The Prime Minister should appoint an e-Minister on Information Age issues to provide political co-ordination of activities on e-commerce and e-Government. The e-Minister should work with a network of Ministers, in key departments with lead responsibilities for e-commerce and e-Government policy delivery.	PM		August 1999
57	14.2: The Government should appoint an 'e-envoy' with a wider remit than originally proposed, covering both e-commerce and the IT elements of the Modernising Government White Paper. The e-envoy should be a high-level champion for Information Age issues across Government, based in the Cabinet Office with a direct line to the Prime Minister.	PM		September 1999
58	14.3: As part of the new arrangements to ensure more effective cross-departmental working, an 'Information Age Management Board' should be established, chaired by the e-envoy, bringing together a small core group of departments with major e-commerce and e-Government responsibilities.	e-envoy		October 1999
59	14.4: Where these do not already exist, officials should be identified in each major department as 'e-commerce co-ordinators'.	e-envoy		October 1999
60	14.5: The e-Minister and e-envoy should together champion implementation of this report and should maintain a 'living' programme of action in taking forward the overarching strategy.	e-Minister/e-envoy		ongoing

\*Note: 30 June 2000 = date for first 'state of e-commerce' report.

## GLOSSARY OF TERMS AND ACRONYMS

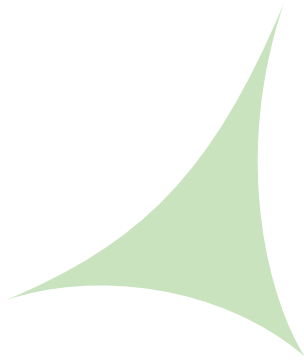
ABI	Annual Business Inquiry. EU (q.v.) business survey.
ADSL	Asymmetric Digital Subscriber Loop. A type of DSL (q.v.).
AEB	Alliance for Electronic Business – an alliance of UK business and industry organisations formed in 1998 to promote UK leadership in e-commerce.
AOL	America On Line. ISP (q.v.).
ATM	Automatic Teller Machine. ‘Hole in the wall’ system for accessing cash.
Bandwidth	A measure of the amount of electronic data that can be transmitted, either down a Telephone line or through an individual radio channel. The broader the Bandwidth, the quicker the information can be transmitted.
BBC	British Broadcasting Corporation. UK public service broadcaster.
Broadband	A class of transmission system which allows large amounts of data to be transferred at high speed. See Bandwidth.
BT	British Telecommunications plc.
CA	Consumers’ Association. UK non-Governmental organisation.
Cable modem	Means of connecting to the Internet (q.v.) using a cable TV network, rather than the conventional telephone line.
CCTA	Central Computer and Telecommunications Agency. (UK Government Agency).
CEO	Chief Executive Officer.
CESG	Communications and Electronic Security Group. (UK Government body).
CISU	Central Internet Strategy Unit. Proposed Unit of UK Government Cabinet Office.
CITU	Central IT (q.v.) Unit – part of the Cabinet Office of the UK Government.
CSSA	Computer and Software Services Association.
DCMS	Department of Culture, Media and Sport. (UK Government Department).
DETR	Department of Environment Transport and the Regions. (UK Government Department).



DfEE	Department for Employment and Education. (UK Government Department).
Digital TV	Television broadcasts using digital technology. Far more efficient use of radio spectrum enables a larger number of channels and supplementary data services to be broadcast.
DMA	Direct Marketing Association. UK private sector organisation.
DoH	Department of Health. (UK Government Department).
DSL	Digital Subscriber Loop. A technology that enables higher bandwidth (qv) Communications to be passed through conventional telephone lines.
DTI	Department of Trade and Industry (UK Government Department).
DTV	See Digital TV.
DVLA	Driver and Vehicle Licensing Agency. (UK Government Agency).
EC	European Commission.
E-cash	Electronic cash. A system that allows cash to be stored on a smartcard (qv).
ECU	European Currency Unit.
EDI	Electronic Data Interchange. A series of industry standards for the exchange mainly of process (q.v.) information between companies in supply chains.
E-mail	Electronic mail – usually sent or received over the Internet.
EU	European Union.
Extranet	A 'Closed' network, accessible only to certain organisations or individuals, that operates using Internet technology.
FCO	Foreign and Commonwealth Office. (UK Government Department).
Fixed-link	Telecommunications (q.v.) using a cable, fibre or point-to-point radio link, rather than mobile telephony.
FSA	Financial Services Authority. (UK Government Agency regulating the financial Services sector).
G7	The Group of 7 most highly industrialised nations.
GICS	Government Information and Communication Services. Unit of UK Government Cabinet Office.
GSI	Government Secure Intranet. Private network connecting UK Government Departments and Agencies.
Hacking	The process of gaining access to private data or systems, without permission from its owner, typically using the Internet.
HMC&E	Her Majesty's Customs and Excise. (UK Government Department).
HMT	Her Majesty's Treasury. (UK Government Department).
HO	Home Office. (UK Government Department).
HSE	Health and Safety Executive. (UK Government Agency).
IAP	Information Age Partnership: a DTI(q.v.) initiative bringing together the main UK Industry players in ICT (q.v.).
ICT	Information and Communications Technology.
Inland Revenue	That part of HMT (q.v.) concerned with tax collection.

Internet	The Internet is an 'open' network allowing anyone to exchange data – as opposed to a 'closed' system such as an Extranet (q.v.).
IPR	Intellectual Property Rights. The right to get a return from the products of one's own ingenuity.
ISDN	Integrated Services Digital Network. A digital telephone service operating over the normal fixed-link network, giving higher Bandwidth (q.v.) access.
ISI	Information Society Initiative (ISI) of the DTI (q.v.).
ISP	Internet Service Provider. A company providing access to the Internet for individual and business users.
IT	Information Technology.
ITC	Independent Television Commission. (UK Government statutory body).
IWF	Internet Watch Foundation. Non-Governmental UK organisation set up to monitor Illegal and fraudulent use of the Internet (q.v.).
LCD	Lord Chancellor's Department. (UK Government Legal Department).
Local loop	The last part of a fixed-link (q.v.) telecommunications (q.v.) network that connects to a subscriber's home or business.
MoD	Ministry of Defence. UK Government Department.
Modem	A device attached to a PC (q.v.) which enables it to communicate using the Internet or other data network.
MP	Member of (UK) Parliament.
NCIS	National Criminal Intelligence Service. (UK Government Agency).
NHS	National Health Service. (UK Government Agency).
OECD	Organisation of Economic Co-operation and Development.
OFT	Office of Fair Trading. (UK Government Agency).
OFTEL	Office of Telecommunications Regulation. (UK Government statutory body).
OGC	Office of Government Commerce. (Proposed UK Government body).
ONS	Office of National Statistics. (Part of HMT (q.v.)).
PC	Personal Computer.
PIN	Personal Identification Number.
PIU	Performance and Innovation Unit. Unit of UK Government Cabinet Office.
PKI	Public Key Infrastructure. A system that allows individuals and businesses to Use Public Key Cryptography (q.v.).
PM	Prime Minister. Leader of UK Government.
PR	Public Relations.
Process e-commerce	Managing flow of information about design, manufacturing, order, quality etc. within industry supply-chains.
PSTN	Public Switched Telecommunications Network.
Public Key Cryptography	A system for encrypting material sent over the Internet by generating a 'pair' of solutions (keys): one transmitted publicly, the other kept private.
RA	Radiocommunications Agency. UK Government agency responsible, amongst other things, for issuing licenses for exploitation of the radio spectrum.





RAu	Radio Authority. UK Government statutory body which decides who can broadcast.
RDA	Regional Development Agencies in UK.
SEU	Social Exclusion Unit. Unit in UK Government Cabinet Office.
SFO	Serious Fraud Office. (UK Government Agency).
SIC	Standard Industrial Classification – for goods and services.
SIM	Systeme Internationale Mobile. Standard for digital mobile communication used in Europe.
Smartcards	Plastic cards containing computer chips that can store data for identification or Electronic cash purposes.
SME	Small and Medium Enterprises
Software	Computer programs
Spam	Unwanted 'junk' e-mail. Can be sent repeatedly, in enormous quantities, at very little cost to the sender and some cost to the receiver.
Spectrum licenses	Licenses given to businesses to exploit internationally agreed areas of the Radio-frequency spectrum. In UK licenses are issued by the Radiocommunications Agency (RA) (q.v.).
Telcos	Telecommunications (q.v.) companies
Telecommunications	Communication using the telephone infrastructure – either land-line or mobile.
Third generation mobile	See UMTS
Transaction e-commerce	Selling products electronically – either business-to-business or business-to-consumer
UMTS	The Universal Mobile Telecommunication Service is a standard for mobile telecommunications that will offer high bandwidth (q.v.) access from 2002.
URL	Universal Resource Locator. The 'address' of a Web site. (takes the form <a href="http://www.[name of organisation or business].[com or co or gov or net].[country uk, au etc]">http://www.[name of organisation or business].[com or co or gov or net].[country uk, au etc]</a> )
VAT	Value Added Tax. Tax on items purchased.
VCR	Video Cassette Recorder
Virus (electronic)	Software (q.v.), usually originating in the Internet, that infiltrates a PC, making something happen that the owner would rather not (e.g. loss of data).
Walled Garden	A 'closed' environment on the Internet allowing users access to a range of Electronic traders selected by the owner of the walled garden.
Web	Another name for the Internet.
Web site	A virtual location on the Internet that has been developed by an individual, business or organisation for the purpose of giving information, advertising or selling its products. Accessed by using a URL (q.v.).
White Paper	Official UK Government document.
WTO	World Trade Organisation.

## LIST OF SOURCES MENTIONED IN THE REPORT

1. IDC research report 1998
2. Emerging Digital Economy II, US Department of Commerce, June 1999
3. DTI Spectrum Benchmarking study – Moving into the Information Age – 1999
4. The Third Wave – written by Alvin Toffler and published by Bantam Books
5. NUA Survey July 1999 <http://www.nua.ie/surveys>
6. DTI 1998 White Paper “Our competitive Future: Building the Knowledge-Driven Economy”. Cm4176
7. Forrester Research Report December 1998
8. IDC 1998
9. Dewan & Kraemer: “International Dimensions of the Productivity Paradox” August 1998
10. DTI White Paper ‘Modern Markets: Confident Consumers’ Cm4410 July 1999
11. “Our Competitive Future – Building the Knowledge Driven Economy”, Cm 4176, December 1998
12. “Electronic Commerce: UK Taxation Policies”, Joint Policy Paper, Inland Revenue and H.M. Customs and Excise, 6th October 1998
13. Informed Sources, 1999
14. Ernst and Young report: “The sky is not falling”, 21 June 1999
15. Financial Times, 30 August 1999
16. “Regulating Communications – Approaching Convergence in the Information Age” (Cm 4022)
17. Romtec EITO/DG3 Study – 1998
18. Consumers’ Association/IPSOS-RSL. May 1999
19. Durlacher Quarterly Internet Report, Quarter 3, 1998
20. Institute of Directors/Oracle Blueprint for Business, 1998
21. PFA, 1999, sample size = 183
22. McKinsey Productivity Report, 1998
23. PEECCS 98 e-commerce survey
24. Spectrum ICT Survey of Businesses 1997/1998/1999 by NOP Research Group
25. The Skills Audit, DfEE and Cabinet Office, 1996
26. OFTEL: “Access to Bandwidth: Proposals for Action”, July 1999
27. European Internet Strategies, November 1998
28. Gallop Survey for De La Rue 1999
29. Forrester report “Braving EU Net Regulation”
30. Survey by Louis Harris & Associates for NCL. April-May 1999
31. Internet Watch Foundation, statistics for 1998. <http://www.iwf.org.uk>
32. Project Trawler: Crime on the Information Highways. A major report from the UK National Criminal Intelligence Unit. Published June 1999
33. Forrester report “Braving EU Net Regulation”
34. AT&T Labs-Research Technical Report TR 99.4.3 14 April 1999
35. Roper Starch Worldwide Survey. May 1999
36. E-Commerce Trust Study. Cheskin Research and Studio Archetype/Sapient. January 1999
37. Financial Times. 23/06/1999
38. Second Roundtable on E-Commerce in Asia
39. DB Everett: Smart Card Technology: Introduction to Smart Cards. Smart Card News Ltd. 1999
40. Modernising Government Action Plan (27 July 1999)
41. Modernising Government White Paper. Cm 4310, March 1999
42. PIU Report ‘Encryption & Law Enforcement’ May 1999
43. Juries in Serious Fraud Trials. A Consultation Document. Home Office February 1998
44. Memorandum from John Battle. DTI 18 March 1998
45. Our Information Age – the Government’s Vision. Central Office of Information URN 98/677; 4/98
46. Review of Civil Procurement in Central Government. London: July 1999
47. <http://www.citu.gov.uk/25percent/spring99.htm>
48. PriceWaterhouseCoopers, “Better Regulation Unit: Cabinet Office Electronic Delivery of Regulation,” London: 5 March 1999
49. Cheskin Research and Studio Archetype/Sapient. January 1999
50. The Future Management of Crown Copyright. Cm4300
51. OECD workshop, 21 April 1999: “Defining and Measuring E-commerce”, organised by the ICCP Division of the Directorate of Science, Technology and Industry
52. OECD: The Economic and Social Impacts of E-commerce. 1999

## APPENDICES

- A1. Role of the PIU
- A2. Project Team and Project Management
- A3. Roundtables and Workshops
- A4. Detailed Discussion of E-commerce Market Failures
- A5. 'Electronic Delivery of Government Services'
- A6. Key Contacts and Interviewees

*Note:* Appendices are not attached to the printed version of this report. Copies may be obtained on-line at [www.cabinet-office.gov.uk/innovations](http://www.cabinet-office.gov.uk/innovations). Appendices are included with the CD-ROM version of this report.