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Introduction

The United Kingdom does not have a unified vision of the Information Society or of the way its national information highways should be organised. The absence of a vision is roundly criticised by some, while others point to the fact that there is no shortage of partial, competing and challenging visions. They point to numerous reports, studies, public debates and private initiatives by a wide range of actors all of whom lay claim to rhetoric and action aimed at promoting innovative developments for the UK's Information Society.

This paper considers the recent history of initiatives on the part of private and public sector players which have stimulated debate on how technological changes in the telecommunication, computing, software and the audio-visual sectors can interact positively with social, economic and political changes to produce a flourishing Information Society. It reviews the way the Information Society 'vision' is articulated in the UK and highlights the main policies and actions that are influencing the short and medium term outcomes in the market. The final section argues that greater co-ordination on the part of public and private actors will be needed if the UK Information Society is to be responsive to the aspirations of all British information producers and users.

Towards a 'Tradable Information Economy' for Britain

The UK experienced a wave of enthusiasm for the Information Economy in the mid-1980s. A rather more coherent vision than that which exists in Britain in the 1990s emerged from the work of the Cabinet Office's Information Technology Advisory Panel. The early vision was characterised by faith in a simple causal linkage between large scale investment in coaxial cable networks and a range of associated technologies, and the emergence of a flourishing tradable information sector.

The British Government tackled the market conditions for the supply of advanced information and communication technologies and services in the early 1980s. British Telecom was created in 1981 with the division of this business from postal operations, and in 1982 Mercury was licensed to compete with British Telecom. The government sought to stimulate investment in cable networks. The 'vision' was one of coaxial cable and copper wire telephony connections reaching into every home (Cabinet Office 1982). One Information Technology Advisory Panel report, *Making a Business of Information*, suggested that: 'the technological changes that underlie IT are bringing together hitherto disparate activities - for example, publishing, film and video production, and the creation of computer software - to create a powerful new economic sector, the tradable information sector' (Cabinet Office 1983: 39). Investment in advanced information and communication technologies was expected to stimulate employment and yield substantial export earnings.

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Little of the hoped for investment occurred and in 1984 a new Telecommunications Act forbade public telecommunication operators from conveying broadcast entertainment services. As Garnham (1994) has argued, the early vision crumbled as significant increases in consumers' willingness to pay for more information failed to materialise. The relatively coherent vision of the early 1980s had little connection with an understanding of the 'process by which individuals and groups make use of the information resources at their disposal to make sense of and act upon the world' (Garnham 1994: 49).

In 1988 a Department of Trade and Industry review of telecommunication infrastructure development argued that the Government's policies should be 'technology neutral'. The key to the development of infrastructure and services should be competition and the further liberalisation of the market (Department of Trade and Industry 1988). If competition was not flourishing, then the market power of British Telecom should be curtailed by restricting the privatised company from participating in entertainment markets unless it was willing to do so through fully separate subsidiaries. Under the Broadcasting Act of 1990, the Government prohibited the public telecommunication operators from providing entertainment services. In 1991, the government ended the telecommunication 'duopoly' which had restricted telecommunication competition to British Telecom and Mercury, but maintained restrictions on both the conveyance and provision of entertainment services by public telecommunication operators until at least 2001. Cable companies were permitted to offer telephony services (Department of Trade and Industry 1991). Inward investment by United States and Canadian-owned companies active in both the telecommunication and cable television businesses began to flourish. By 1995, 135 cable franchises had been awarded covering nearly 70 per cent of the UK population.

Regional and Global Visions

Early enthusiasm for the Information Economy had been driven largely by producer interests in innovative technologies and services and by applications for larger companies. When Vice-President Albert Gore resuscitated the vision of an infrastructure for the United States in 1992 with his call for the promotion of a National Information Infrastructure (NII), emphasis was put on the uses and applications of the infrastructure for a much wider range of users (NTIA 1993; Pipe 1994: 7). In Europe, the White Paper on *Growth, Competitiveness and Employment* called for actions to stimulate the creation of new markets for all producers and users - 'The Commission proposes to identify strategic trans-European projects... The strategic projects would be carried out at each of three interdependent 'levels' that make up the telecommunication networks: the carrier networks for transmission of information, generic services and telematics applications' (European Commission 1993).

A High Level Group on the Information Society reported on the prospects for a European Information Society in 1994 observing that, while the implementation of appropriate infrastructure for the Information Society in Europe would rest primarily with the private sector and be driven by demand, demand would need to be built up and priority would need to be given to creating enthusiasm for new applications (Bangemann 1994).[1] The report called for actions that would foster 'an entrepreneurial mentality' to encourage the emergence of commercially viable advanced information and communication technology applications using a widely diffused integrated broadband network infrastructure. It sought a commitment to a 'common regulatory' approach to stimulate a competitive, Europe-wide market for information services, and an end to protected markets. Private sector investment and

1 Priority applications included teleworkng, distance learning, universities and research centre's network, telematic services for small and medium sized enterprises, road traffic management, air traffic control, health care networks, electronic tendering, trans-European Public Administration Networks, and City Information Highways.

initiative was fundamental to this vision for Europe. The result was expected 'to improve the quality of life of Europe's citizens, the efficiency of our social and economic organisation and to reinforce cohesion' (Bangemann 1994: 6).

This European vision was embedded in the G7 Ministerial Conference on the Global Information Society in February 1995. As the President of the European Commission put it:

> 'Dawn of a new age; the new industrial or socio-economic revolution whatever description we choose - the information society is now upon us. This is not intergalactic pipedreams, nor futurologists running wild! The truth is that the technology is now available and available at economic prices. It is therefore both the present we are considering and our future. The demand for the services of the information society appears unlimited....I believe that the development of the information society also offers the European Union a unique opportunity to advance our own competitivity and the well-being of our peoples across all of our continent' (Santer 1995: 81)

Although this vision was constructed to appeal to a wide range of producers and users, it was developed in the main by the larger producers of the European Information Society's products and services rather than by its users. The High Level Group 'Bangemann' report was concerned to strengthen the competitive prospects of the producer community against the incursions of globally operating producers domiciled in other regions of the world. While not neglecting users or the potentially divisive character of a Europe of information 'haves' and 'have nots', there was little in this vision to indicate how such divisions might be prevented other than by reliance upon market forces.

This is not the only vision of the Information Society which has emerged in Europe. The 'First Reflections' of another High Level Group of Experts on the Social and Societal Aspects of the Information Society shows considerable awareness that the European Information Society must be constructed 'for us all'. In this report the focus is less technology driven and more concerned with the 'ways in which information can be converted into useful knowledge, so that the 'information economy' may become a 'knowledge-based economy' and the technology can be put at the disposal of all' (High Level Group 1996: i). A learning society in which people can control their information environment and in which the uneven distribution of the benefits of new information and communication services are addressed through policy measures is the centrepiece of this vision.

The Commission's *White Paper on Teaching and Learning* looks to advanced information and communication technologies to contribute to the 'disappearance of routine and repetitive work...work content will increasingly be made up of intelligent tasks requiring initiative and the ability to adapt' (European Commission 1996: 23). But it also raises concerns as to whether the educational content of the new networks 'will enhance or, on the contrary, diminish the knowledge of the individual ... The fear is the risk that the quality of multimedia products, particularly educational software, could lead to knowledge of the 'lowest common denominator' in which people lose their historical, geographical and cultural bearings' (European Commission 1996: 23).

There are signs in Europe that consideration is being given to the social, economic and political conditions that must be in place if individuals and corporate groupings are to control the gateways to the European Information Society. Nevertheless, much is presumed about the characteristics of the producers and users. Producers are expected to favour and promote highly competitive markets. Private individuals, public sector institutions and companies of all sizes are assumed to be willing to devote a growing share of their expenditure to accessing and using electronic information.

The rhetoric which is used to articulate the various visions of the European Information Society displays a deeply rooted de-coupling of the production-consumption relationship. The producers struggle to comprehend and predict the aspirations of users of electronically coded information. They acknowledge the serious challenges they face in doing so, but reducing uncertainty about user preferences is proving to be an elusive goal. User communities, apart from the larger business community, including small and medium sized enterprises, individual citizens, educationists, public service providers, and others, struggle to overcome the heterogeneity which characterises their needs and to have an influential voice in the design and deployment of innovative networks and applications.

This decoupling phenomenon is not intentional or unobserved. It is, however, proving extraordinarily difficult to address. If the social, economic and political goals espoused for the European Information Society are to be encouraged and implemented, the production-consumption interface will need to be re-coupled. There are signs in the UK that attention is being paid to this interface, but there are other disquieting signs. The initiatives that are being taken do not adequately account for the market power of certain players on the producer side of the interface. Nor do they give sufficient attention to the impact of these developments on the distribution of benefits on the consumption side of the interface. That is, the capacity of private individuals to shape and control their electronic environments is not the primary focus of policy.

British 'Cyberspaces': Towards an Information Society

With global attention being accorded to the Information Society, in Britain attention is focusing on the country's capacity to lead in the innovative production of advanced information and communication technologies and services, the diffusion and use of these services and applications, and on the economic incentives for competition created by the structure of the market.

Innovative Capabilities

The UK Technology Foresight Programme has involved widespread consultation with producer and consumer communities using Delphi surveys. The sectoral analyses were completed in 1994 and topic areas included the Communication, Information Technology and Electronics, Financial Services, and Leisure and Learning sectors. The respondents were typically male, working in industry and in the 40-59 age group (77% of respondents were male, 4% female, 18% not indicated) (Loveridge et al. 1995) and it is therefore this group's perspective which informs visions of the way technical innovations will affect the Information Society in Britain.

The exercise pointed to emergent themes which have important implications for infrastructure networks and service delivery. For example, telecommunication was expected to become a virtually 'free' good, providing a backbone for multimedia systems that would facilitate business transactions of all kinds, including virtual marketplaces. Extensive teleworking is expected together with the development of interactive route finding information using satellite communication and the availability of pocket terminals able to access all communication networks. The home was perceived as a node (virtual information palace) where high capacity information superhighways would facilitate the use of entertainment services; multi-way interactive audio/visual services, electronic mail, multi-media services and intelligent terminals, to assist purchasing based on analysis of electronic purchasing patterns. Smart surveillance systems are also expected to diffuse widely. Pervasive monitoring using a variety of sensors, neural networks or other learning systems of individual activities was

another emergent theme (Loveridge et al. 1995). [2]

In the Communication sector, the 'top ten' topics emerging from the Delphi survey as having a beneficial impact on wealth creation and the quality of life during the years 2000 to 2009 provide an indication of an emergent, albeit non-consensual, vision of the Information Society.

- Complete merger and integration of mobile, personal and fixed communication networks to provide a universal telephony service to all users [2005 to 2009; high 'Never' response]
- Widespread use in the developing countries of radio call boxes for wireless public access [2000 to 2004]
- More than 50% of the UK population have personal telephone numbers that are portable and independent of network or geographical location [2005 to 2009]
- Practical use of mobile personal communications terminals capable of providing multimedia services over radio networks [2000 to 2004]
- Widespread use of interactive multimedia services and telesoftware for training/education at home [2005 to 2009]
- Widespread use in UK of multimedia teleworking enables people to work from home for much of the working week [2000 to 2004]
- Widespread use of on-line information and software services for leisure activities, such as video-on-demand, news-on-demand and hobbies [2000 to 2004]
- Widespread demand from UK users for high bandwidth real-time communications requires massive expansion in capacity of the public network [2000 to 2004]
- More than 50% of domestic telephone users in UK are also connected to mobile radio networks [2000 to 2004]
- Widespread use of interactive multimedia services and telesoftware to aid learning and make better use of specialist tutors in 'virtual universities' [2000 to 2004]

Complementary topics emerged from other sector studies. In the financial services sector the following topics emerged in the 'top ten':

- The UK is better than its major competitors at adapting laws and regulations to take account of new technological developments [2000 to 2004; high 'never' response]
- The cost of telecommunications falls by 75% of its current level [2000 to 2004]

The information technology and electronics topics in the 'top ten' included:

- UK is one of the top three world-wide sources of applications content in multimedia products and services [1995 to 2004; high 'never' response]
- IT systems for home or general use at work routinely require negligible training for 90% of users [2000 to 2004, high 'never' response]

Finally, the 'top ten' topics for the learning and leisure sector included:

- 25% of homes are connected to a high-capacity, interactive 'superhighway' for information, communications and entertainment [2000 to 2004]
- Expert 'navigation' systems enable simple access to data 'warehouses' for all domestic users at all levels of computer literacy [2000 to 2004]

Nearly all of these topics involve changes in the behaviour of private citizens and the

2 Refer to Loveridge et al. (1995) for a detailed explanation of the method and results and their interpretation.

corporate community. In many cases barriers to the achievement of these and other aspects of the Information Society vision were perceived to be institutional. They included the need for greater competitiveness on the part of the producer community, the removal of restrictive regulations, and the need to allocate greater financial resources to innovative research and development. There were few signs of recognition of the need to find effective of ways of re-coupling the production-consumption interface.

Diffusing and Using 'Convergent' Information and Communication Technologies

The UK leads Europe in information technology, multimedia and communication technologies and services. Perceived strengths rest upon the increasingly international use of the English language, and strong publishing, broadcasting, music, entertainment, and educational sectors, and widespread awareness of information technologies among the younger generation. In 1994, the market for information and communication technologies in the UK was valued at £334 million compared with £2,020 million in the US and £1,140 million in Europe to which the UK contributed more than 30 per cent. Large corporations have the greatest take up of applications. Fax usage is widespread and there is growing penetration of E-mail (mainly for internal purposes), telephone conferencing, voice mail and videoconferencing. There is a comparatively low level of CD-ROM usage which has been attributed to the lack of specific business applications relative to consumer markets (Department of Trade and Industry 1996).

In Britain enterprises with 100 or more employees have invested in PCs but among enterprises with less than 100 employees, almost half have no PCs at all. The greatest penetration of PCs is in the education, public, communication and financial services sectors and the average penetration of PCs in small and medium sized enterprises has been estimated to be about 0.3 per employee (Department of Trade and Industry 1996). Table 1 shows the distribution of use among companies of various sizes.

Insert table 1 about here

Few data are available on use of the Internet by small and medium sized enterprises. One study found that only three per cent of smaller companies were connected to the Internet. A further 47 per cent of companies did not believe an Internet connection was of any immediate use for their business (Department of Trade and Industry 1996).

In the telecommunication services market, BT has retained a substantial market share after a decade of liberalisation and entry by new players. Tables 2, 3, and 4 show BT's position relative to Mercury, Kingston - a local telecommunication company, and the other operators providing public telecommunication services including cable operators.

Insert Tables 2, 3, and 4 about here

As far as prices are concerned, Table 5 shows that the UK is ranked third in most cases (Mason 1996).

Insert Table 5 about here

There continue to be substantial differences between the profiles of corporate users of telecommunication in the US and Britain. US companies are much greater users of Centrex and Virtual Private Networks and of specially tariffed freephone services. They are lower users of ISDN and mobile services. US corporate users pay lower prices for all telecommunication services except mobile telephony if the prices actually paid are compared. Where published tariffs are similar or even higher for some services such as leased lines than in the UK, significant negotiated discounts are available to most business users in the US (Nucleus 1996).

By the end of 1995 the number of cable television subscribers in Britain increased to 1.32 million and the number of installed telephone lines by the cable industry increased to a total of 1.419 million as compared to BT's 26.6 million lines (Snoddy 1996). The average number of cable television subscribers able to receive services is only 21 per cent in the UK as compared to early forecasts of 40-45 per cent (Price 1996). The cable companies are co-operating in a major advertising campaign in an attempt to increase penetration rates (Oftel 1995a).

Cable companies compete with broadcast television which, unlike the United States, does not suffer from frequent advertising interruptions, bad reception or poor programming outside large cities. In addition, cable services are frequently more expensive than BSkyB satellite television by £2 to £3 per month for the basic package of channels. By October 1995, BSkyB had an estimated 3.5 million subscribers compared with the cable companies' 1.3 million (*Financial Times* 1996).

The cable companies in the British market are experiencing losses and a period of consolidation is expected. For example, Videotron, a Canadian-owned cable company, experienced a loss of £7.76 million on its British operations on a turnover of £41.6 million for the nine months ending May 1995. It has decided to sell its operations in order to concentrate on the North American market (Gibbens and Snoddy 1996).

To stimulate the diffusion and use of advanced information and communication technologies, the Department of Trade and Industry launched an Information Society Initiative in February 1996. The aim is to encourage development and use among British enterprises.

> 'In the development of this Information Society, we have to recognise that the private sector has a very important part to play. It has the resources to build the Superhighways, the inventive spirit to develop new and exciting applications, and the entrepreneurial flair to market services to consumers. ...But Government still has a number of crucial roles to play: in providing leadership; in encouraging the best conditions for the development of markets; and in acting as an intelligent user of the new technology' (Speech by President of the Board of Trade, June 1995 in Department of Trade and Industry 1996).

The main barriers to the further diffusion and use of applications that are being emphasised in the new initiative include legal issues, lack of understanding of multimedia and appreciation of the benefits of applications for businesses, organisational issues including the use of applications to gain external business advantage as compared to internal operational efficiencies, the need for training and problems arising from the exposure of skills gaps; and technical barriers including bottlenecks created at the LAN-WAN interface, and the management of large amounts of data. The new programme is to focus on education and awareness building; provision of skills/training for service providers; the creation of a favourable regulatory and legislative environment; the promotion of standards; and support for British exporters (Department of Trade and Industry 1996).

The Government also has encouraged debate and analysis on Information Society issues. For example, the Government's Communications Technology Agency (CCTA) issued a consultation document in 1994 calling for innovative measures to stimulate the use of electronic government information services, introduction of Internet-based services, encouragement for Local Authority applications and participation in European projects (CCTA 1994).

The failure to espouse a *coherent* national plan for a UK Information Society has been lamented by the Parliamentary Office of Science and Technology (POST). Its report following a detailed review of global, regional and UK developments observed that 'without a national vision, National Information Infrastructure development may be slow and fragmented and the UK's influence at the EU/G7 reduced' (POST 1995: 2)

In 1995, the Department for Education set out its views on the way the telecommunication, cable, broadcasting, information technology and multimedia industries should work with the education community to pilot new projects which would produce a commonly accessible national, and ultimately international, education superhighway (Department of Education 1995).

Investment Incentives, Competition and Market Structure

As the largest telecommunication company in the UK, BT's contribution to the Information Society debate is hardly surprising. BT has argued strenuously that global market conditions are radically changing and that it must be a key global player in all parts of the global market. It has argued that its prospects are jeopardised by the Government's continuing prohibition on its entry into entertainment markets. It has also suggested that interactive services can be, and will be, supplied throughout the nation if BT is permitted to compete directly in all services with cable franchisees. The cable companies, again unsurprisingly, have pointed to BT's continued dominance in the national marketplace. They maintain that competition will not flourish if the Government's commitment to a 'a stable, effective and evolutionary environment' (Department of Trade and Industry 1994) were to change suddenly.

The House of Commons Trade and Industry Committee responded to this debate in 1994. Their report, *Optical Fibre Networks*, chastised the Government for failing to recognise the need for innovative measures to ensure Britain's leadership in the face of the convergence of the telecommunication, broadcasting, publishing, information technology and consumer electronics industries (House of Commons 1994). The all-party committee found that Government policies could be hindering the development of advanced information infrastructure and services. The report suggested that foreign-owned cable companies, in fact, have not been building 'superhighways' (broadband switched networks) and that BT could upgrade its network to offer broadband services reaching 80 to 90 per cent of customers (not exclusively by optical fibre) at a cost of £15 billion in addition to planned expenditure.

The Committee asked the Government to reduce uncertainty in the market by requiring the relevant regulators, the Directors General of the Office of Telecommunication (Oftel) and of the Independent Television Commission (ITC) to review the licences for current cable franchise areas, taking account of build obligations contained in the licences, with a view to allowing competition in franchise areas. They recommended that the restrictions on public telecommunication operators, including BT, be lifted on a franchise by franchise basis at specified dates, subject to the principle that all cable franchises should be exclusive for seven years from the granting of the original licences. In addition, the Government should make clear that all restrictions on conveying or providing entertainment would be lifted by the end of 2002, provided that public telecommunication operators were prepared to permit fair and open access to their networks (House of Commons 1994: 48).

The Government's response held steadfast in its position that the UK's Information Society must evolve out of a partnership between the public and the private sectors. The Conservative Government's 'vision' continues to look to effective competition policy and the market to stimulate the innovation and experimentation needed to encourage commercially successful services which will benefit all British users.

> 'Looking ahead, the key conclusion which emerges from this review of possible new communication and media services is that there is great scope for more innovation and imagination. Communication networks (in the UK at least) are being built faster than applications are being developed to fill them. In the short term that will put further downward pressure on prices. In the longer term, if the UK is to establish itself at the leading edge of this second information revolution, UK businesses and the communications industry will need to experiment, and take commercial risks to do so. The public (in both the business and domestic markets) must be encouraged to embrace change and welcome experimentation. All that will only work with a regulatory framework liberal enough to allow it to happen, and resilient enough to cope with consolidation and even occasional failure.' (Department of Trade and Industry 1994: 9)

Prohibitions on public telecommunication operator conveyance and provision of entertainment services were retained. The Government offered the opportunity to BT and other telecommunication providers to use their infrastructures to provide entertainment and telephony services to *test* new services. The Government found that the regulatory framework is appropriate to build strengths in broadband communication markets. The Government also indicated its willingness to give greater emphasis to co-ordinating and encouraging its use of applications. Following the publication of the Government's response to the House of Commons Trade and Industry Committee, BT told the press that it was abandoning plans to spend £15 billion to bring broadband interactive services to the majority of the population (Tieman 1994).

The Government's actions have failed to mollify BT. BT's Chairman, Sir Iain Vallance, observed in June 1995 that 'Governments must decide, and decide now, on the global framework which will allow the Information Revolution to happen. They must decide what the <u>few</u> rules should be. They must put in place the mechanisms to <u>enforce</u> them. And then they must get out of the way of those who can make it happen' (Vallance 1995).

BT's argument in favour of minimum regulatory restrictions on its activities is persuasive if one overlooks the company's continuing dominance of the UK market.

> 'The implications of marking time in the UK while the world moves on are serious in an industry as dynamic as telecommunications. If regulation prevents BT's world-leading research and development programme keeping up with market demand, companies will tend to use non-UK technology, effectively migrating talent, expertise and jobs. UK media groups could be disadvantaged by comparison with US entertainment conglomerates, tied to US telecommunication operators, who would control a key part of the nation's infrastructure. BT does not want a monopoly. BT wants to build a high quality, interactive national network able to compete with other networks delivering different services' (British Telecom 1995).

In contrast to the Conservative Government, the Labour Party has tended to focus greater attention on the need for policies to redress inequalities in the diffusion and use of the information infrastructure and service applications. Because the Labour Party is a strong advocate of investment in a high capacity switched infrastructure to enable a variety of

economic, political and social goals to be met it has not encouraged discussion of the implications of BT's continuing ability to exercise its market power. For example, the Labour Party has suggested that 'the Information Superhighway is about improving the quality of our medical care and providing better educational opportunities and developing new business links and enhancing our democracy. Above all, it's about ensuring that the benefits of this profound revolution are available to all of our people, in all parts of the country, not just to a few' (Smith 1995: 2)

The Labour Party's policy is to establish a firm date for the removal of prohibitions on BT's entry into the entertainment services market. The Labour Party entered a concordat with BT such that the company would provide 'free' connections to link schools, libraries and colleges to the information highway. The Conservative Government responded by announcing a £10 million project involving 200 educational institutions and 38 private companies and number of new pilot schemes have been introduced. The telecommunication regulator also announced a 'universal service fund' which could help to defray some of the costs of education links. Costs would be shared across the public network operators avoiding direct public subsidies for connections to support the use of electronic services in education (Bright 1995).

The Information Society Production-Consumption Interface

The idea of an Information Society 'vision' as an enabler is central to the views of the Director of DEMOS, an influential London-based think-tank. Geoff Mulgan has argued that the vision should be flexible; it might simply set out how the majority of UK citizens are likely to benefit from new Information Society applications in the future (Mulgan 1994).

Scott (1995) and Armstrong et al. (1994) provide comprehensive reviews of the past decade of regulatory change in the UK. By early 1996, the Office of Telecommunication (Oftel) had initiated a great many debates and made proposals for strengthening competition in the British telecommunication market.[3] The overall goal of the regulatory regime is 'to seek the best value for the customer in terms of quality, choice and value for money' and to: i) secure fair and sustainable competition in the independent service provider market by ensuring that abuse of dominance is contained and that anti-competitive practices are deterred; ii) to withdraw from detailed regulation of the market and seek, where possible, to regulate, where required, through broad, simple, non-intrusive controls; and iii) to clarify how regulation will operate in particular circumstances so that all service providers know where they stand' (Oftel 1996).

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3 Oftel documents include: 'Effective Competition: Framework for Action - A Statement on the Future of Interconnection, Competition and Related Issues', Statement, July 1995; 'The Customer Interface to Public Networks', Consultative Document, July 1995; 'The Future Regulation of Premium Rate and Similar Services', Consultative Document, July 1995; 'Beyond the Telephone, the Television and the PC', A Consultative Document on the regulation of broadband switched mass-market services (and their substitutes) delivered by telecommunication systems, August 1995; 'The Use of Directory Information', Consultative Document, October 1995; 'Pricing of Telecommunications Services from 1977', Consultative Document, December 1995; 'Fair Trading in Telecommunications', Statement, December 1995; 'Universal Telecommunication Services', Consultative Document on Universal Service in the UK from 1997, December 1995; 'International Direct Dialled Calls', Consultative Document on how to secure the benefits of competition for the users of international telephony services, December 1995; 'International Accounting Rates', Statement, December 1995; 'Telecoms: Price Control and Universal Services - A Consumer Guide', December 1995; . Number Portability has also been addressed and the results of an inquiry by the Monopolies and Mergers Commission into Telephone Number Portability are being incorporated into regulations affecting BT by Oftel in 1996.

Telecommunication regulation is primarily concerned with the structure of the market and the sustainability of competition under present conditions. The regulator faces a number of major issues. Among these are whether BT is benefiting disproportionately in the enhanced services market from its position as the dominant network operator; whether BT is unfairly cross subsidising enhanced services from other BT activities; whether BT should be required to 'unbundle' the services it offers; whether technical interfaces should be open and/or BT should agree to attach non-approved apparatus; whether independent service providers should have the same access to numbers as network operators; the benefits to BT from integrated marketing, billing and branding over the whole range of its services; and whether the regulatory regime should distinguish between fixed and mobile networks or between voice and data services.

The analysis of the advantages to BT under present market conditions differs depending upon the definition of 'the market'. There are several submarkets that need to be considered (Oftel 1996). In the *Network Services* submarket BT has 94 per cent of all residential exchange lines in the UK. Mercury, Energis, Scottish Telecom and the cable companies are constructing competing networks, but the network services market is not yet competitive. In the *Basic Retail Services* submarket BT is the dominant supplier and its market share in the UK (by revenue) for simple voice telephony ranges from 94 per cent for local calls to 70 per cent for outgoing international calls. The regulator has concluded that BT has significant market power in services which are difficult to separate from the underlying network services, e.g. call diversion, call waiting, caller display, call return and 'ring back when free'. Finally, in the *Enhanced Services* submarket, BT's overall market share comprises approximately 50 per cent of a market worth about £1 billion with competition from Mercury, AT&T and data service providers such as IBM. These services include voice related services (number translation, premium rate, calling card) and personal numbering services; data services such as on-line information, electronic mail, electronic data interchange, data transaction, Internet access); and video services including video telephony and conferencing, business TV, etc.

To tackle the issue of market power, the regulator has proposed a new condition which would apply to BT's licence and which would prevent BT from engaging in any activities that could be interpreted as preventing, restricting or distorting competition in the telecommunication market (Oftel 1995c). The Director General of Telecommunications has suggested that regulation should impose fewer detailed *a priori* prescriptive rules; but that the onus must be on dominant operators to ensure that they do not engage in anti-competitive behaviour.

The regulation of BT has become increasingly controversial. In a public statement in March 1996, the Director General of the Office of Telecommunications observed that:

> 'If Oftel regulates BT in such a way that share holders cannot earn a sufficient return on their capital they will not invest and customers will suffer. It is, therefore, not in the customer's interests nor is it part of Oftel's objectives to penalise BT's shareholders. ... However, this does not mean that BT should be able to earn monopoly profits for its shareholders by exploiting customers or seeking to exclude competitors through its very powerful market position' (Cane 1996 quoting D. Cruickshank).

BT has been freed from some elements of the price regulation. For example, in February 1996, the company was given permission to raise charges for exchange line rentals by more than 2 per cent above inflation rate. This was accompanied by the removal of access deficit charges. The cable operators and others serving local and trunk markets have expressed concern over BT's pricing schemes. As 'price takers', they are concerned that margins will be cut if BT continues to lower its prices in submarkets where it faces more effective

competition.

In March 1996, merger discussions between Cable & Wireless and British Telecom were reported and, at the time of writing, there was speculation that Deutsche Telekom would purchase the C&W subsidiary, Mercury. AT&T is increasingly active in the UK. AT&T has designed a network by linking leased circuits of other operators and negotiating interconnection agreements with BT and Mercury. These developments could have a significant impact on the economic incentives for investing in the UK's communication infrastructure and associated services.

BT has not neglected the Internet and the services which it may support. A service enabling access to the Internet for consumers has been introduced with an initial cost of £20 and monthly £15 charges thereafter. The service includes unlimited access at local call rates. BT expects to participate as a major player in the market for Internet services which it projects will reach £2 billion in the UK by the year 2000 (Cane 1996). BT is competing in this market with companies such as America On Line who (through a joint venture with Bertelsmann) have offered all British secondary schools free Internet connections. The cable companies are also offering Internet access (Snoddy 1996).

In the UK the need for an *OfCom* (Office of Communication), an integrated regulatory institution for broadcasting and telecommunication has been raised. Several observers, including Mulgan (1994), Cave (1994) and the present author (Mansell 1993, Mansell et al. 1995, Mansell and Steinmueller 1995a, 1996), have called for a rethinking of the regulatory framework as a means of enabling the vision of an equitable Information Society to become reality. There is an urgent need to focus on the social, as well as the economic, dimensions of the way the Information Society evolves.

Co-ordinating Information Society Futures

Today the Information Society rhetoric is pervasive, far more so than the advanced information and communication services which it is intended to signal. This is as it should be; a visionary metaphor serves an important purpose. It guides and shapes public debate and business strategy. But if it is to shape investment in ways that are responsive to broad social, cultural, political and economic goals, far greater co-ordination of policies and regulations affecting producer and consumer behaviour will be needed. Far-reaching questions will need to be answered about how people will interact with electronic media of all kinds in the future. What kinds of impacts will current trends in the diffusion and use of infrastructure and services have on individual rights to privacy, democratic processes, industrial development, and national and regional competitiveness?

For the UK, and for the European Union as a whole, a transition to an Information Society that is responsive to all the aspirations of citizens will not be easy. Placing faith in technological solutions has never been a satisfactory way of addressing societal problems; and the case of advanced information and communication technologies will not be different. The recoupling of the production-consumption interface will require the construction of visions which emphasise knowledge and learning within a social milieu that links electronic and other modes of human interaction. Innovations in advanced information and communication technologies could support many different trajectories toward the Information Society. Different communities of producers and consumers do not share the same interests. At present the most likely trends on the producer side favour companies representing the largest players in the telecommunication, broadcasting and computing sectors (Mansell and Steinmueller 1996).

To preserve and enable other players on the producer and consumer sides of the market,

policy actions will be needed. For example, there will be a need to develop user skills for the use of Internet and World Wide Web services through the provision of access in schools and libraries throughout the UK. There also will be a need to examine the outcomes of emerging standards in the Internet including the definition of the Internet communication protocols, information transfer standards, and pricing practices, in relation to the need for the wider use of service applications.

The political parties in the UK have located the Information Society at the centre of their respective technical, economic and social visions. They are differentiated by the attention given to economic growth, competitiveness, quality of life, democratic processes and distributional goals. However, common to all these visions is a pervasive, if undocumented, belief that individuals in their homes and workplaces will produce and consume electronic information in ways that differ very little from those of the past. There may be greater quantities of information, products may be more heterogeneous, but there are few signs that the production-consumption interface is expected to differ radically from the past.

Information packaged by suppliers (individual, public administrative, or corporate) will be available for a price in the market. The user will be expected to pay in order to access and use the information. Alternatively, the owner (advertiser) will be expected to pay in order to capture the attention of users who, in turn, will pay for and consume other goods and services as a result. In short, the commodity mode of exchange is being transferred to cyberspace. The primary organising constructs in the predominant visions of the Information Society rest on the private appropriation of information protected by intellectual property rights. Exceptions occur in instances where consensus emerges on evidence of 'market failure'. In areas such as public health, some aspects of education, or environmental safety, special policy measures are being considered to call attention to the need for some information to be exchanged in the public domain and at no cost to the end-user.

It will be necessary for all the stakeholders in the Information Society to consider the funding of the investment requirements of a common infrastructure for advanced communication services on the basis of revenue generating consumer services. This may lead to reduced interconnection possibilities to Internet or Internet-like services as providers seek to enforce intellectual property protection. In fact, preserving educational uses and broad public access to Internet services may require a more cautious approach to extending intellectual property rights than is favoured by the larger companies in the telecommunication, cable, broadcasting, publishing and computing/software industries (Mansell and Steinmueller 1995b).

The major producers are attempting to gain control over the gateways to the Information Society. Their perspectives on strategic and policy issues reflect their current positions in the market. The resolution of debates on social and economic policy issues will affect business and consumer freedom of access to, and use of, information. Competition among the companies will bring commercial and social benefits to some users in the Information Society and not to others. As Samarajiva has observed, what is really new about the Information Society is the increasing emphasis it gives to relationships between producers and producers and between producers and consumers (Samarajiva, forthcoming 1996). It is not just the existence of a more complex set of these relationships which is a central feature, but the quality of them and the variability of the capacity of citizens to control them. Those who succeed in controlling the gateways to the Information Society via their knowledge of the multiple transactions of individuals and corporate entities will gain economically. However, citizens, company employees and managers are not passive recipients in the new environment. Their power to decide whether to use advanced services, and where necessary, to pay for them, will influence the design of infrastructure and services for Information Society. This interface between consumption and production remains perhaps the least understood aspect in the Information Society debate (Mansell and Silverstone 1996).

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Table 1

Usage of Information and Communication Technologies by Company Size, 1995

ICT Application	Small Companies 10-99 employees %	Medium Companies 100-199 employees %	Times Top 500 500+ employees %
E-Mail (internal & external)	26	40	65
Internet	3	6	n/a
Videoconferencing	-	12	30
CD-ROM	8	14	19

Source: Department of Trade and Industry 1996 compiling various sources.

Table 2

PSTN retail call revenues, by type of call and customer (£ millions)

1993/94	**All Operators**	**BT**	**Mercury**	**Kingston**	**Others**
Local Calls	2232	2126	80	7	19
National Calls	2371	2039	296	17	19
International Calls	1287	945	308	4	29
All Calls	5891	5111	684	29	67

Source: Oftel 1995b.

Table 3
Number of Exchange Lines, 1994 (millions)

	All Operators	**BT**	**Mercury**	**Kingston**	**Others**
Business Customers	6.43	6.17	0.19	0.03	0.04
Residential Customers	20.94	20.47	0.00	0.14	0.34
All Customers	27.38	26.64	0.19	0.17	0.38

Source: Oftel 1995b.

Table 4
Number of Leased Lines, 31 March 1994

	All Operators	BT	Mercury	Kingston	Others
Analogue	352459	334732	0	3692	14035
Digital	n/a	92057	n/a	1070	850

Source: Oftel 1995b. n/a (not available)

Note: in 1993/94, BT's revenues from connections of leased lines were £ 52.1 million - analogue and £36.4 million - digital. All others accounted for £0 for analogue and £5.0 million for digital. Revenues from rentals of leased lines in the same year: BT £464.7 million - analogue and £465.7 million - digital; Mercury £0 - analogue and £116.5 million - digital; Others £1.6 million - analogue and £2.1 million - digital.

Table 5

Business Telecommunication Prices
Purchasing Power Parity Price Ranking, 1996

Service	UK	US	Sweden	France	Australia	Germany
Business Telephony	3	2	1	5	4	
ISDN	2	3	1	5	5	4
Analogue Mobile	4	5	1	6	2	3
Digital Mobile	3	5	1	4	2	6
Private Circuits	3	2	1	5	4	
Calling Cards	2	4	1	3	5	
Freephone Services	3	1	2	5	4	

Source: Mason 1996 for Oftel.