The nature of the information society:
An industrialized world perspective

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1   Introduction

The weaving together of digital networks and information with the social networks of the twenty-first century has very significant implications for all of us. No matter how we choose to define the 'information society', there are many unanswered questions about how, and the extent to which, we should promote developments that give an increasingly central place to the use of information and communication technologies in our lives. Regardless of whether we believe that today's information societies are fundamentally new, or that they are simply an extension of certain features of existing societies, the global spread of networks means that there are major implications for those who can participate easily and effectively and for those who cannot.

This paper looks first at what the 'information society' is coming to mean for many of the stakeholders who develop policies and strategies in the industrialized countries. For many of them, the significance of emerging information societies lies principally in the way they may foster 'knowledge-driven' economic growth. This feature is influencing the development of policies and business strategies. It is shaping the rate and structure of investment in networks and the main ways in which learning and information exchange are taking place.

In the industrialized countries, distinctive diffusion pathways are emerging for the way businesses, governments and citizens are using digital technologies. Section three examines some of the principal forces influencing these diffusion pathways and at recent evidence on the nature of these pathways among business, government and citizen users of information and communication technologies (ICT). The consequences for economic growth and social development are also considered.

In section four, policy and regulatory priorities are examined. This section emphasizes the need for policies to promote learning and capability building alongside the development of policies and regulations to address the changing characteristics of electronic networks and services.

Although the prices of digital technologies are declining, the construction of information societies still comes at a high cost. There is persistent exclusion of people in some geographical areas and as a result of under-investment in an appropriate skills base, especially for those who are already marginalized. Mobilizing investment to address the 'digital divide' increasingly involves fostering partnerships. Section five considers whether various kinds of partnerships show signs of being able to bridge the full magnitude of persistent divides of many kinds, particularly in developing countries.

Section six briefly highlights issues of stakeholder participation in designing information societies and the tendency of the predominant 'information society' vision to perpetuate certain asymmetries in the distribution of economic and social resources, even as the benefits of digital technologies and services become increasingly widely available. The conclusion emphasizes the need to ensure that development priorities are placed at the top of all efforts to mobilize investment in ICTs.

2   Fostering 'knowledge-driven' growth

An emphasis on the need to foster 'knowledge-driven economies' in order to achieve the growth necessary to underpin inclusive information societies began to gain currency in policy circles in the late 1990s. The European Union set targets for becoming the most competitive and dynamic 'knowledge-driven' region in the world. In the United Kingdom, the Department of Trade and Industry (DTI) gave priority to building the knowledge-driven economy in a White Paper published towards the end of the decade. In the United States, there were strong hopes that investment in 'new economy' services would continue to boom and that there would be substantial economic benefits from investment in digital technologies. The World Bank's 1998/99 Development Report made a strong case for greater investment in knowledge as a means of tackling poverty and a range of persistent development problems.[1]

The rush to develop 'information society' visions and 'knowledge-driven economy' strategies was not limited to the industrialized countries. For instance, the United Nations Economic Commission for Africa developed the Africa Information Society Initiative (AISI); Singapore developed its Intelligent Island vision and others such as South Africa also developed their own visions and strategies. In the 'hope department',

many experts argued that ICTs would provide the opportunity for the developing world to 'leapfrog' and catch-up with, and occasionally even surpass, the wealthy countries in the industrialized world.

Discussions about the growing importance of knowledge accumulation and absorption were often accompanied by assertions about the impact of rapid innovations in ICTs and of increasing investment in digital networks and their applications. Many acknowledged that the new technological 'tools' could have both positive and negative social and economic consequences. It was also recognised that there might not be a straightforward relationship between investment in digital technologies and services and positive gains for economies or social welfare. Nevertheless, the mobilization of concerned stakeholders around the problems posed by the 'knowledge-driven' growth agenda continues to emphasise the technical and economic features of these developments over the social and cultural features.

The significance of these developments – whatever their social and economic implications – by the early years of the twenty-first century, was being recognized. The creation of the G8 Digital Opportunities Task (DOT) Force and the decision to hold a World Summit on the Information Society (WSIS) in 2003 and 2005[2] are signifiers of this at the highest levels. Most participants in these and many related forums admit today that social considerations are as important as the economic dynamics of emerging information societies.

At the practical level of policy formulation, however, with respect to the development and use of the new technologies including the Internet, there is still a tendency to put the analysis of technology diffusion and the dynamics of ICT-related markets first. This tendency is exemplified by the following quotations that come from the Executive Summary of a report prepared by Prime Minister's Strategy Unit in the United Kingdom in 2002 on the challenges presented by the spread of digital networks:[3]

> "Electronic networks - including narrowband and broadband internet, and mobile networks—are important to the United Kingdom because they allow businesses to interact quickly and effectively, give consumers access to a wide range of information and services, and allow Government to communicate with citizens and deliver services effectively."

> "There is reasonable evidence from the United States that ICT investment has had a positive impact on productivity and growth. However, evidence of the specific impact of electronic networks is less clear, as is evidence of the impact of ICT investment in other countries, including the UK. Despite this, business level case studies show how important it is for Government and regulators to remove any barriers to the effective deployment of electronic networks."

> "Innovation in electronic networks over the next decade is expected to result from the evolution of existing networks rather than the creation of new networks, and wired technologies are expected to remain key for data transmission."

> "[…] it is likely that current incumbent operators of electronic networks will retain elements of market power over the next decade; if this is so, many of the challenges faced by Government and the regulator will be similar in principle to those faced today […] Government will need to distinguish clearly between competition objectives and wider policy goals […]."

> "Given this view of market development, a number of challenges have been identified for the regulator: how to deal with market structure issues, including SMP [significant market power]; how to balance infrastructure competition against service competition; how to encourage innovation and market growth, while ensuring network resilience; and how to manage the evolution of regulation, and ensure its proportionality" (Strategy Unit 2002).

These observations are quoted at length here because – with some differences in emphasis on the role of the market and on the implications of electronic networks for consumers and citizens—they are consistent with prevailing views about the role of government policy with respect to ICTs in the information societies of the industrialized countries. The main driver of these societies over the next decade is expected to be investment in electronic networks and services that contribute to economic growth and competitiveness.

The emphasis of national policy in many industrialized countries focuses strongly on how digital networks can contribute to productivity gains, on the structure of national and global ICT-related markets, and on the kinds of regulation that will stimulate innovation. Although, these quotations are specific to the United Kingdom, they are echoed in most of the wealthy countries around the world. Although, policies with respect to social considerations are not absent from government initiatives, they tend to become detached from the

consideration of measures to address economic issues. This in turn fosters an inordinate focus on the technological landscape and a strong technology 'push' vision of unfolding information societies.

2.1 The technological landscape

The technological landscape that underpins today's vision of information societies is depicted in Figure 1. The emphasis on the components of this landscape varies from country to country, but the components are mostly all in place. The emphasis of policy is on promoting their widest possible diffusion.

Figure 1: ICT Landscape
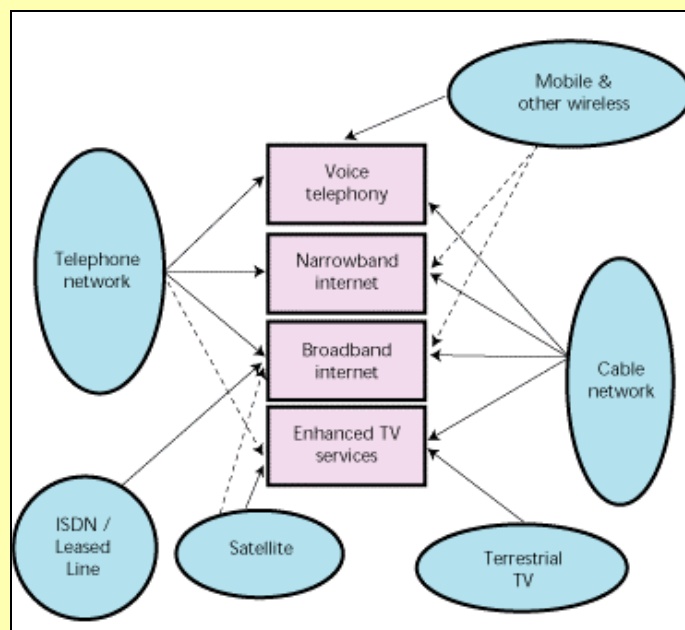
Source: Adapted from Strategy Unit (2002).

This landscape comprises wired and wireless networks and a variety of digital platforms. Technological innovation in most of these areas is continuing at a rapid pace, but the network infrastructure is expected to develop further based on technologies that are available today. The greatest sources of innovation to support the 'knowledge-driven' economy and information societies, more generally, are expected to come from changes in network applications, services and access devices. Diffusion pathways for all these innovations might be disrupted by power-line technology or by the spread of ultra wide band networks, but the commercial viability of these has yet to be demonstrated.

Wired and wireless networks are likely to develop as complements to each other and there are many different views about which combinations of content and services will be accessed via personal computers and the telephone set—and a large number of other access devices. In addition, for the research community, Grid Computing is developing to enable the sharing of computer processing power and to link up distributed knowledge bases in areas such as particle physics, biomedicine and environmental forecasting.[4]

2.2 The increasing intensity of technological mediation

Given this technological landscape and the increasing emphasis on an economic and social order that is intensely mediated by ICTs, what can we say about the implications for knowledge-driven growth and for information societies in the industrialized world? When we try to examine the implications of the deployment of the new networks and services, we find that most assessments are partial at best. Not only is it difficult to examine the relationships between investment in the technologies and social and economic outcomes, but it is virtually impossible to separate out the consequences of investment in the network infrastructure from investment in the services that these networks support. Simply defining the category 'ICT' also presents problems.[5] Macro-level studies of the productivity impacts associated with ICT

investment tend to conclude that differences in the definitions of ICTs, in theoretical and methodological approaches, and data deficiencies, make it very difficult to decide whether the industrialized country economies are reaping benefits from their ICT investments.[6]

Micro-level evidence on the social or economic 'impact' of investment in these technologies is generally qualitative and based on case studies.[7] In Europe, few studies have directly focused on the question of whether investment in ICTs is generating productivity gains at the company level. In contrast, in the United States, there have been attempts to measure corporate productivity gains on a systematic basis.[8] Nevertheless, despite the lack of systematic analysis of the economic—and to some extent social—issues, it is reasonably clear that the demand for ICTs is influenced by changing patterns of information consumption across different technology platforms, and one of the most significant of these is the Internet.

There are also differences in the rates of ICT spending and investment between the European Union member states and the United States. Throughout the 1990s, spending on hardware, software, communication equipment and other ICT services was less than six per cent of European Union gross domestic product (GDP) as compared to eight per cent in the United States. Similarly, investment in ICTs accounted for two per cent of European Union GDP and nearly 3.5 per cent in the United States.[9] The spread in both spending and investment between the European Union and the United States has increased over time.[10] These gaps in ICT spending and investment rates are however not present in all European Union countries. For instance, the patterns in Sweden, the United Kingdom, and the Netherlands, do not differ markedly from the United States.[11]

It is often suggested that problems in areas such as economic growth, equality and employment can be addressed by taking advantage of the ICT revolution. But experience has shown that simply increasing the rate of investment in the technological infrastructure does not lead 'naturally' to social and economic improvement. Three important features of the knowledge-driven economy mean that there will always be an uncertain and complex relationship between technological investment and social or economic outcomes.

2.2.1   The 'systems' features of ICTs

An important feature of today's networks and services are the 'systems' characteristics. This feature gives rise to considerable unpredictability in the ICT diffusion process. The pathways along which ICT demand may develop are numerous, and time is always required for users to become accustomed to ICT applications and to develop a willingness to use them (and, in some cases, to resist the new applications completely).

The journey along the diffusion pathways can be accelerated or slowed down by the systems feature of ICTs. For instance, the way the market for asynchronous digital subscriber line (ADSL) services develops depends on other parts of the ICT system and on the social system in which these services are embedded. Users' capacities to smooth the diffusion process are affected by their experiences, skills, and the adaptability of their customs and practices. The social system and its features are as important as the technological systems in influencing how information societies develop. If key components of the ICT and the social system are relatively immature in a given country or region, the social and economic developments so often associated with digital technologies are not likely to be as extensive as many enthusiasts predict.

2.2.2   Digital information exchange models

A second feature of the knowledge-driven economy is the models that are available for the exchange or sharing of digital information. During the Internet's initial growth, many assumed that 'peer-to-peer' networking would favour content and information production tailored to the interests of small groups and individuals. Everyone would become a content producer and this would drive demand for ever-higher bandwidth networks.

The business models that are predominating in the industrialized countries for the circulation of digital content and information suggest that a point-to-multipoint distribution model is likely to prevail for some time. As the Institute for Prospective Studies in Seville puts it, 'customization of content may still be possible but it will be offered only if users are willing to pay extra for it'.[12] The 'peer-to-peer' model of digital information exchange is not becoming the major driver of the diffusion of ICTs. Although there is considerable 'peer-to-peer' sharing of music, films and other entertainment files via the Internet, this is not a viable business model for the major content producers, i.e. the members of the 'copyright' industry.

Nevertheless, the 'peer-to-peer' model does offer many opportunities to extend the reach of user participation in the information societies of the industrialized countries.

Legislation with respect to intellectual property protection is having a major impact on the evolution of information societies. A key factor that may slow the development of the 'peer-to-peer' model is the attempt, largely by the major content producers, to extend and deepen copyright protection of digital information. Securing information stored and transmitted over networks is important for the development of digital content markets. But it also raises the costs of creating and exchanging digital information and content. This creates obstacles for the creative development of some kinds of digital information. It also reduces the opportunities for building ICT skills and competencies. The balance that is struck between the protection of digital information and opportunities to access digital information is crucially important for the information societies that the industrialized countries are seeking to foster. Encouraging greater scope for using digital information resources is likely to lead to improved user learning, the third key feature of the knowledge-driven economy.

2.2.3   Learning is the weakest link

The nature of the learning process is a key feature that influences the diffusion pathways of ICTs. These pathways depend on 'the interplay of technological potential, commercial exploitation and socio-economic acceptance'.[13] Deficiencies in the skill and competency base for applying ICTs can slow the diffusion process and reduce the social and economic gains that might otherwise be associated with investment in the new technologies. In most of the industrialized countries, the development of an adequate skills and competency profile with respect to ICTs is uneven at best. Employers are concerned about skill shortages and about the quality of the graduates who are available to meet demand.[14]

Learning is also essential for encouraging practices that safeguard the protection of personal privacy and enhance the security of digital information. Technical methods to manage the boundaries between the private and public lives of ICT users cannot substitute for social and legal choices. Advances in ICT use for storing and processing messages are creating the potential for using aggregated data to protect national security and to secure commercial competitive advantage. But these advances have major consequences for the extent to which people can learn to live their lives in an intensely technologically mediated environment.

Building trust in digital networks and services depends on a variety of complicated learning processes, but trust is essential if we want our information societies to be inclusive. Trust in the commercial exchange of digital information and content delivery is very important, just as it is in 'peer to peer' models of information exchange. Both require a variety of learning experiences that occur as a result of using the new technologies and services.

Much of the empirical evidence on ICT diffusion simply measures access to digital technologies. It provides little insight into the forms of learning that are occurring and which help to build the kinds of skills and capabilities that are consistent with effective participation in information societies. At present, the understanding of these issues is fragmentary at best in the industrialized countries.

3   ICT diffusion pathways for business, government and citizens

The above discussion of the systems, information exchange and learning features of ICTs and related services helps to understand some of the ways in which businesses, governments and citizens are developing their ICT-mediated environments. In this section, recent evidence is examined on key developments among user groups to provide insight into the variety of ICT diffusion pathways that exists.

3.1   Business users of ICTs

There are numerous studies of the way value chains are being affected by investment in ICTs and, specifically, by the implementation of Internet-enabled services in the industrialized countries.[15] In many member countries of the Organisation for Economic Cooperation and Development (OECD), most Internet sales involve business-to-business transactions, with financial services in the lead. Although electronic commerce transactions are increasing in value, they are still a small proportion of total transactions.

While the majority of companies in the industrialized countries are adopting basic uses of ICTs, relatively few companies in these countries have reached the most sophisticated levels of usage. Very often, ambitious

visions of the potential of ICTs to support inter- and intra-corporate integrated databases prove to be very costly to implement in practice, not least because of the costs of the requisite organizational changes. The impact of ICTs on industrial sectors and individual companies is strongly influenced by industry (and country) specific dynamics. These include inter-company operating practices and product characteristics. Overall then, it can be said that although technology is the driving force of changing communications, applications and services, it is not the determining factor in successfully promoting ICT use.

ICTs are tools that businesses can apply to achieve their aims, but investment is often governed by whether managers believe that their expectations for business benefits will be achieved. Among the benefits expected as a result of increased ICT use are:

- Cost reductions accruing to companies;

- Increased transaction speed and reliability;

- Improved management capabilities;

- Improved collaboration capabilities;

- Stronger interdependencies within upstream and downstream markets; and

- Better customer relations management (CRM).

However, representatives of companies often indicate that they have yet to experience most of the benefits. Managers who can point to benefits generally have invested heavily in learning and organizational change strategies. Effective and efficient use of ICTs is unlikely in the face of negative senior management attitudes and a lack of appropriate in-house workforce skills.[16] Providing customized training is vital for improving ICT adoption rates, especially among smaller businesses.[17]

In the case of business-to-consumer electronic commerce services, the relatively slow diffusion of secure servers is one factor that may be slowing the growth of these services. In addition, this area may only be viable for goods and services with high search costs and experience qualities. Generating trust through brand recognition and providing adequate consumer protection remain key issues in this area.[18]

There is some evidence that, for companies that are not tightly linked into value chains, the implementation of electronic commerce is unlikely to have a positive impact. The deployment of electronic commerce by small companies in the industrialized countries operating in markets for tangible goods also seems to lead to 'lock-in' and to being forced to participate in supply chains dominated by traditional large buyers.[19]

In general, investment in ICTs is likely to yield gains for businesses only if there is parallel investment in learning, organizational change, and measures to enhance the perceived safety of networks and online transactions.

3.2 Government users of ICTs

There is a growing body of literature on the contribution of digital networks and services to democratic processes. Much interest focuses on the way governments interact across departments, as well as with businesses and citizens. In this area, as in the case of business applications of ICTs, the main factors that affect the diffusion pathways and their outcomes are the characteristics of the environments in which the new networks and services are introduced. There is no direct relationship between ICT investment in this area and the potential for greater transparency of the State or of governance processes more generally.

Electronic or e-government participation rates vary less among the European Union countries than between these countries and the United States. All European Union countries except for Greece were classified in the United Nations (UN) 2001 global benchmarking report as having 'high e-government capacity'.[20] The United States was rated as the most e-enabled country of the 190 UN members. This index incorporates an assessment of a country's official online presence, its telecommunication infrastructure, and its human development capacity.

Studies of ICT-enabled public services in Belgium, Finland, Germany, and Italy suggest that they are more successful if they begin from small-scale process innovations driven by the efforts of local administrations.[21] Projects that are evaluated as being the most successful tend to be implemented in parallel with regulatory and policy changes. The learning curve to implement e-government services is very long and it is proving to be difficult to transfer lessons about service development from one locale to another.[22]

E-government services generally seem to follow a particular pathway, involving the following:
- establishing a basic official website;
- extending the non-interactive website presence;
- providing limited interactivity;
- providing transaction capability, and
- providing 'one stop' interactive services.

However, the patterns of e-government provision vary considerably. For example, in Western Europe, government-to-business transaction services are less widely available than government-to-government and government-to-citizen services. According to one survey, as of 2002, Denmark, France, Germany and Portugal had the most developed government-to-business electronic service markets.[23]

The factors that encourage the take-up of e-government services are varied but the deployment of these services is expected to lower costs and increase transaction speeds. Developments in the government-to-citizen and government-to-government e-services areas are expected to help to modernize government, reshape democratic processes and enable direct public service delivery to citizens.[24] Barriers to the spread of these services are thought to include the slow take-up of digital signatures, security concerns, the costs of replacing existing information systems, a lack of adequate infrastructure and the high costs of organizational change.[25]

The potential for e-government services to foster a re-engagement of citizens with the political process and to reduce government inefficiency is the subject of considerable debate. Some observers argue that e-government services are being driven mainly by technology rather than by the needs of companies and citizens. The design of some of these services may be inconsistent with the aim of achieving increased transparency.[26] Some local government initiatives are developing e-services by involving users and technology designers in a process of learning,[27] but implementing ICTs in ways that involve users means changes in policy and practice that are slow and incremental.[28]

Citizens may be encouraged to use government web sites when the services are up-to-date, easy to access, accurate, and reliable. But low expectations of government, a lack of trust in government information, and the absence of clear evidence of benefits for users given their existing routines are all factors that make the ICT diffusion pathways in this area difficult to predict.

Overall, in the case of e-government services there has been substantial change in recent years, but there also is resistance. Organizational barriers of many kinds exist and there is a real need for local initiatives that are citizen-centred. Improving confidence and trust in government and building a sense among citizens that e-government services are relevant to their lives are both essential to support information societies.

In addition to citizen resistance, the lack of 'access' by a still high percentage of the population even in the industrialized world is a crucial hindrance to the further development of these services. This may provide a justification for governments to facilitate the wider diffusion and use of ICTs, since government services are to be provided to all. Alternatively, it may be that many services for citizens also need to be provided by physically present people. There is a need for much deeper critical reflection about when the use of ICTs is appropriate and when it is not.

3.3   Citizen users of ICTs

The features of ICT use that are likely to be most attractive from the citizen's or consumer's perspective are very uncertain. The growth of demand for Internet access, particularly, is strongly influenced by the regulatory treatment of wholesale and retail pricing.[29] In the industrialized countries, various kinds of incentives are needed to stimulate the development of higher capacity networks and their use for the delivery of a variety of bandwidth-hungry services. There also is continuing uncertainty about how the advertising, pay, and public service fee paying revenue models will fare in the future.[30] Greater interactivity, the use of personalization tools, the growth of online banking and ordering, and interactive games, are all expected to stimulate the ICT-related consumer market. But, the diffusion pathways are subject to dramatic change as citizens and consumers respond to a growing variety of products and services.

The patterns and motivations for citizen's use of digital technologies differ considerably across the industrialized countries. For example, mobile telephony users in the United Kingdom seem to associate the mobile phone with morality, greater efficiency, productivity, and independence, and a desire to aspire to the

upper-middle class.[31] In Finland, in contrast, the rapid adoption of the mobile phone seems to be challenging Finnish linguistic culture, self-images, and some characteristics of the social environment.[32]

Research on young people's assimilation of ICTs suggests that the use of multi-channel television, the personal computer, and the Internet rarely radically changes their lifestyles.[33] However, use of the new media does seem to affect the social environment by redefining private and public consumption patterns.[34] Research also suggests that more intensive use of ICTs by citizens may be limited by the absence of any perceived need or interest. People's preferences for shopping in person, their concerns about the security of payments, their privacy concerns, and their lack of trust in electronic networks, all influence the diffusion pathways. The evidence suggests that there are some large hurdles to overcome if technological mediation is to play a larger role in our everyday lives. For non-users of ICTs, the biggest barrier to greater use is often the perceived 'irrelevance' of the Internet in their lives.

In the industrialized countries, although ICTs and the Internet are becoming more widely available, some citizens and consumers need to be convinced that changing the way they access services—especially government services—will benefit them. If the perceived lack of relevance of ICTs that persists among some people is to change, learning opportunities will need to be tailored to the levels of skill of different user groups. It may also be that citizens value their off-line lives more than policy-makers and the architects of policy are willing to acknowledge.

3.4   The overall message about ICT diffusion pathways

The main message from many studies of ICT diffusion in the industrialized countries is that use depends on social, economic, political, cultural, organizational factors.[35] This message may seem very simple, but it rarely filters into the practices of those who develop and deploy the new digital networks and services. Some commentators have argued that:

> "The relationship between technological change and social transformation is now acknowledged to be a complex one, and the simple notion of technological changes having social [and economic] effects, which in turn can be simply controlled by appropriate policies, has now been shown to be false."[36]

But although policy-makers are becoming far more receptive to this message than they have been in the past, it is still not sufficiently taken on board during policy implementation. The policies that are put in place to encourage knowledge-driven growth and inclusive information societies are being developed today by a wider range of stakeholders than in the past—including business, government, and civil society actors. But precariously few resources are devoted to ensuring that a 'technology push' approach is not the outcome by default at the implementation stage. Involving all stakeholders throughout the process of constructing information societies is, and will continue to be, very costly. However, this is a cost that must be borne if we are serious about building twenty-first century information societies that are socially and economically beneficial for everyone.

4   What are the priorities for policy and regulation?

The previous sections highlight some of the multiple factors that may account for differences in the ICT diffusion pathways within and between the industrialized countries. One of the most significant factors is the length of the learning curve needed to benefit from the use of digital networks and services.

To promote the take-up of ICTs, regulation is needed to encourage competitive entry in some market segments. Encouraging universal access to public networks and limiting discriminatory and unfair restrictions on network access and usage continue to be important issues for regulators. For instance, demand for high bandwidth services is sensitive to the effects of interconnection models on retail prices.[37] In addition, because interconnectivity between the Internet and television is a feature of commercial digital television the further development of interactive television will pose issues for regulation, especially with respect to public service broadcasting. Reliance on self-regulation by Internet service providers may not be sufficient in the future since 'the Internet, by its nature, does not automatically lead to more openness and competition'.[38] In summary then, regulation with respect to Internet interconnection and peering arrangements is likely to be necessary.

The industrialized countries—with the possible exception of the United States—seem to be failing to capture the full range of social and economic benefits of investment in ICTs. The learning process is a key factor in

determining the speed and direction of ICT diffusion and whether it will yield positive social and economic gains. A key issue for all countries is whether there is sufficient investment in the ICT skill and competency base across all user groups, and especially smaller companies and citizens. This should be the highest priority for policies aimed at promoting information societies.

Even though the links between ICT investment, learning, and social and economic outcomes are indirect, it is clear that skills and competency development through learning is central in shaping the diffusion pathways. Policies aimed at promoting a broader distribution of the skills base through effective learning are likely to strengthen ICT demand.[39]

The fact that organizational change is costly and that potential ICT users may resist the new services is often overlooked or underestimated. It needs to be recognized that resistance from users may be because of perceived threats to their established routines and customs or because of their preferences for organizing their work and leisure time. Variations in ICT use within and across countries are associated with local learning opportunities[40] in the household, in companies, and in public sector and civil society organizations. In all countries, "… the distribution of ICT competencies is of crucial importance to understand actual and future innovative capability"[41] There are also major differences in the 'learning regimes' associated with different technologies and applications.[42]

Some people will continue to be marginalized within information societies either because of their geographic location or their socio-demographic position. Expanding access to digital networks offers a means of expanding ICT-related learning opportunities and this may help to alleviate forces that exclude people from participation in our information societies.

Generally, policy action in the industrialized countries may be justified on the grounds of evidence of market failure – a justification that relies heavily on an analysis of the dynamics of 'knowledge-driven' growth. However, technological and social systems failures in the ICT area may be addressed by policy actions that rely on a justification based on the importance of providing 'global public goods'[43] When ICTs are seen as tools for knowledge-driven growth and inclusive information societies, there is a justification for public intervention to redress the effects of exclusion. These effects may be due to lack of infrastructure access or they may be due to a host of social considerations ranging from the lack of local content to an inadequate skills base.

The need to promote the spread of the digital infrastructure and services in areas where markets are failing to deliver can be based on a policy framework that acknowledges that digital information networks and services are 'public goods' (or at least quasi-public goods) and that some public funding is justified. In information societies of the twenty-first century, digital infrastructure, networks and services should in some instances be treated in this way. In this context, partnerships are increasingly being favoured as a means of augmenting access to ICTs in some geographical areas and for those people who would otherwise be excluded. These partnerships take a wide variety of forms and encompass many types of organization. The next section examines recent experience with partnerships for investment, especially in the context of measures to address exclusion in the developing countries.

5   ICT investment through partnerships

There is little agreement about what a partnership entails. Some commentators argue that partnerships cover "...a multitude of arrangements between public, private and voluntary agencies and between agencies and service users".[44] Much attention in recent years has focused on public-private partnerships (PPP). The OECD defines these as "any innovation-based relationship whereby public and private actors jointly contribute financial, research, human and infrastructure resources, either directly or in kind".[45] For others, they "are contractual arrangements whereby private companies are involved in the financing, ownership, and sometimes, operation of public facilities".[46]

Economic and social pressures on poorer regions and countries are prompting an examination of how "new social partnerships" might contribute to development[47] These new partnerships seek to combine public, private and civil society organizations in mutually beneficial relationships. According to one analysis, the business case for the new social partnerships can include:

- enhancing corporate reputation—by being seen to contribute to social and economic development;

- managing, motivating and retaining quality employees—by working in partnership with employees to provide better labour standards;

- strategic market positioning—by engaging in partnerships to gain access to new markets, promote and enhance brand image, and gain access to market intelligence;

- improved operational efficiency and quality—by reducing input and transaction costs, increase process efficiency, and improve quality of products and services;

- promoting better risk management and access to financing—by increasing awareness of external pressures and developing systems for monitoring governance issues and anticipated problems; and,

- investing in a stable society and a healthy economy—by creating future markets though investing in social and economic development.[48]

Partnerships have been used to encourage a private sector role in operating public utilities, often to reduce the financial burden on the public sector or in an attempt to increase the efficiency of service delivery. Contract-based forms of public-private partnerships proliferated in the 1980s, but a greater focus on collaboration emerged in the late 1990s in the industrialized countries. Often these have been used in the healthcare, education, transport and public utility sectors as well as to encourage innovation and development in new technologies.[49] They are relatively recent in the ICT sector. But partnerships of many kinds are now being championed as a means of addressing the 'digital divide'.

The G8 Digital Opportunities Task Force report of 2001 suggests that the 'digital divide' will be alleviated only through the use of "innovative multi-stakeholder [public sector, private sector, civil society] partnerships". The Task Force recommended that:

> "Private-public partnerships involving companies, local entrepreneurs, governments, non-profit organizations and labor organizations should be encouraged, in order to foster local enterprise, innovation and lifelong learning; these should include an emphasis on basic education (including mathematics and sciences), as well as on vocational training and the development of core ICT skills … development finance institutions should also be encouraged to increase their participation in relevant concerted private-public initiatives."[50]

The Global Knowledge Partnership, a consortium of public, private and civil society participants, has called for activities to promote knowledge-based development through the increased use of ICTs in developing countries. It supports "partnership, concrete action, and collective learning among the public, private, and non-governmental sectors".[51] The UN Economic and Social Committee High Level Consultative Meeting initiated an ICT Task Force in 2000. It is expected to build "partnerships, networks and consortia for actions among relevant stakeholders, including the private sector, at global, regional and national levels".[52]

In 2002 the United Nations General Assembly, with the support of the UN's ICT Task Force, hosted a panel discussion on the 'Digital Opportunity: The Role of Public-Private Partnerships'. There have been numerous other initiatives involving public and private sector partners especially aimed at bridging the 'digital divide' in Africa.

The promotion of partnerships has been accompanied by an increase in the number of PPPs in the ICT sector with a focus on developing countries. One study[53] identified 12 PPP programmes spanning more than 28 ICT sector initiatives in more than 20 developing countries. The same study indicated that for the 58 organizations examined:

- Company partners are typically multinationals in networks and communication equipment, the electronic and telecommunication industries;

- Financial, consultancy, and aerospace multinationals are also involved;

- Multinational companies represent 18 per cent of the organizations involved in the surveyed PPPs, while local companies represent just 7 per cent;

- Five donor agencies are involved in surveyed PPPs, representing six per cent of the total number of partners;

- National public sector organizations, ranging from ministry departments of education to universities, science and technology agencies, and national public telecommunications operators (PTO) constitute 21 per cent of the organizations surveyed;

- Civil society organizations, ranging from religious groups to associations of vegetable growers, national and international non-governmental organizations (NGO) dedicated to ICT and development issues, represent the major sector of organizations involved, representing 48 per cent of the total.

The corporate partners in this sample included Intel, Cisco, Ericsson, Hewlett Packard, CapGemini, Vodacom, Nortel Networks, Sun Microsystems and Microsoft, all of whom are major producers in the ICT sector. The public partners were numerous and included departments of government, universities, the World Bank, the International Development Research Centre (IDRC), Unicefs and others. In most instances, civil society organizations were involved directly or indirectly.

5.1   Mobilizing partners in partnerships

Key to the new forms of collaboration is the very notion of 'partnership', as opposed to foreign donor aid. Partnerships in the ICT sector in developing countries are seeking both to create incentives for collaboration and to build capabilities. In some cases, ICT companies are providing financing and core business competencies through partnerships with national governments, public sector organizations, donor agencies and local civil society organizations. It is notable that the aims of these initiatives are generally very ambitious. Boxes 1 through 4 highlight several current initiatives.

The Global Digital Opportunity Initiative (GDOI) (see Box 1) is intended to support a comprehensive and robust strategy to harness ICTs for development. But can we expect the GDOI to make a significant impact? The initiative is relatively new and not many countries have signed up. The long-term impact is likely to depend on whether there is a genuine commitment and buy-in, not only by internal stakeholders, but also by the donor community, to support ICT strategies. It will also depend on whether the ICT strategies address the fundamental issues of capacity and capability building and whether they are actually implemented. Given the 'strategy fatigue' in the developing world as a result of demand for numerous policy papers and plans by potential partners there is a high risk of increasing cynicism.

Box 1: Global Digital Opportunity Initiative

Concerns that many poorer countries and underprivileged people will be left behind without a robust national ICT strategy and policy for development led to the Global Digital Opportunity Initiative (GDOI). The Initiative is a public-private partnership between the UNDP, the Markle Foundation and Accenture. GDOI was set up to seek a better understanding of, and approaches to leveraging, the unique benefits of ICTs to realize sustainable human development. The Initiative plans to facilitate the strategic adoption and utilization of ICTs by developing countries. It offers a strategic framework for national 'ICT for development' strategies and for mobilizing resources and expertise to implement national priorities. The GDOI also aims to build public support for increased attention to the opportunities presented by ICT applications.

The GDOI seeks to identify priority areas for the mobilization of additional resources following multi-sectoral stakeholder dialogues on national development strategies. Implementation will engage local teams and GDOI partners to promote specific programmes for wider support and create the ability to monitor results. The initiative is expected to: 1) make the case for the importance of ICTs in sustainable human development; 2) formulate high-level approaches to harness ICTs for development; 3) develop, launch and analyse pilot initiatives; and 4) launch a stakeholder dialogue to build a constituency and coalition in support of ICT investment and development efforts.

The first target countries, South Africa and Mozambique, are actively involved. Mozambique has issued a formal Presidential invitation, while South Africa has passed legislation mandating a new e-Strategy within two years. The GDOI is expected to support a diverse set of developing countries in the first three years with selection emphasis placed on the prospects for impact, sustainability and demonstration value.

Source: Digital Opportunity Initiative website (http://www.opt-init.org/), and presentations by S. McCue, UNDP and C. Fritteli and F. Tipson, Markle Foundation.

In the case of the Cisco Networking Academy programme (see Box 2), capacity building offers the potential to reduce the 'digital divide' and to expand the opportunities of the poor through acquisition of marketable skills. The challenge is whether the specific skills fostered by the Networking Academy are the most relevant ones for developing countries. Is the capacity that is being built up in networking what is needed? Is there a risk that the programme is helping to educate people, only for them to migrate to the industrialized countries, exacerbating the problem of 'brain drain'? The Cisco Networking Academy programme is often justly cited as a successful example of a public-private partnership. Nevertheless, like other programmes, its overall impact needs to be assessed in terms of whether it is making significant contributions towards the long-term transformation of national economies and societies.

Box 2: The Cisco Networking Academy Programme

The Cisco Networking Academy was launched in the United States in October 1997 with 64 education institutions in seven states—Arizona, California, Florida, Minnesota, Missouri, New York, and North Carolina. The Networking Academy has spread to over 145 countries and 50 US states. Over 260,000 students have enrolled at more than 9,800 academies located in high schools, technical schools, colleges, universities, and community-based organizations.

The Cisco Networking Academy is a comprehensive e-learning programme focused on providing students with Internet technology and computer networking skills. The programme delivers web-based content, online assessment, student performance tracking, hands-on labs, and preparation for industry-standard certifications. Cisco Systems trains the Cisco Academy Training Centres (CATCs); the CATCs train Regional Academies; the Regional Academies train the local Academy instructors who then educate students.

The Cisco Networking Academy is a global project with partnerships and alliances with industry leaders such as Adobe, Computing Technology Industry Association (CompTIA), Digital Island, Hewlett-Packard, Fluke, Microsoft, Oracle, Sun, and partners such as Communications Workers of America (CWA), the US Department of Labour, the International Youth Foundation, the Institute for International Education, Native American Communities, the United Nations Development Programme (UNDP), United States Agency for International Development (USAID), Organization of American States, United Nations Economic Commission for Africa (UNECA), United Nations Development Fund for Women (UNIFEM), US Department of Housing and Urban Development, United Nations Volunteers (UNV), and the World Bank/InfoDev.

Along with UNDP and the World Bank Group, Cisco has made its programme available to students in developing countries through the least developed countries (LDC) Initiative established at the G8 meeting in 2000. As a result of the LDC Initiative, Cisco Networking Academies have now been established in nineteen African countries—namely: Angola, Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Cote d'Ivoire, Democratic Republic of Congo, Djibouti, Eritrea, Ethiopia, Gambia, Ghana, Guinea, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mozambique, Niger, Nigeria, Rwanda, Swaziland, Tanzania, Togo, Uganda, and Zambia. Academies have been established in 28 of the world's 48 least developed countries. Furthermore, in an effort to address the gender divide in ICTs, and in collaboration with other partners, emphasis is placed on female enrolment in the Networking Academy programme.

Source: Cisco at: http://cisco.netacad.net/public/index.html, and UNDP at: http://www.undp.org/rba/ict4dev.html.

For the E-Learning Asia initiative (see Box 3), as noted by Coca Cola, the initiative is a "direct response to national needs and national visions". Supporting countries to realize their nationally developed information society visions provides an opportunity for solving the 'digital divide' problem. But the challenge remains to achieve the long-term sustainability of these national initiatives. Can this and other initiatives be leveraged to reach the millions who are left out of such initiatives?

> **Box 3: E-Learning Asia**
>
> E-Learning Asia is a partnership between Coca Cola, governments, NGOs, multilateral development organizations such as the United Nations Development Programme (UNDP) and educators. The programme is a pan-Asia initiative set up to help benefit and empower a new generation of teachers and students through the innovative and relevant use of ICTs.
>
> The aim is to assist communities throughout Asia to bridge the growing 'digital divide'. As a result of several national initiatives under the programme, thousands of young people across the region are being given the opportunity to learn about computers and the Internet, develop their ICT skills and further their studies through e-learning.
>
> In Vietnam, 40 Coca Cola Learning Centres have been set-up in collaboration with National Youth Union and the Ministry of Education-Training in secondary schools and youth centres across the country. The plan is to establish centres in all the 61 provinces in Vietnam. In the Philippines, the initiative—codenamed 'Coca-Cola ed.venture'— was established in April 2001. Fifteen Internet-connected computer centres in remote schools have been established. The initiative is run in collaboration with the Manila-based Foundation for Information Technology, Education and Development.
>
> The programme has trained over 630 public high school teachers and administrators and has benefited over 15,000 Filipino school children. The initiative has also been established in China in collaboration with the China Youth Development Foundation and has benefited over 10,000 Chinese students and their communities. In Australia, the initiative has created 10 Beanbag Net Centres targeting disadvantaged youths in urban areas. The aim is to cover every state in Australia. The initiative in Australia is in collaboration with Inspire Foundation and Microsoft Australia. In Malaysia the initiative—E-Learning for Life—is a joint project with the UNDP. Launched in March 2002, the initiative has established six ICT hubs in secondary schools in urban and rural areas. The programme is benefiting over 10,000 students as well as their teachers and local communities.
>
> *Source*: The Coca Cola Company, at: http://www2.coca-cola.com/citizenship/education_asia_digital_divid.html.

As a final example in this category, the Internet Initiative for Africa (IIA) (see Box 4), is a partnership with a clear objective of facilitating investment in the Internet infrastructure by African countries. If it meets the objective and successfully links African countries to the Internet, the initiative will be deemed a success in helping to reduce the 'digital divide'. However, its impact is limited by the low level of national bandwidth in these countries, where the cost of Internet connections remains very high. The majority of the population is neither connected, nor effectively participating in the new kinds of information societies that are emerging.

These and other partnerships seem to offer a means for determining the appropriate public/private balance for delivering certain goods and services.[54] The market's apparent failure to deliver a good that is deemed 'essential' by public policy offers an incentive for public participation in a partnership, while the private sector partners clearly have an interest in the long-term development of new markets.

> **Box 4: The Internet Initiative for Africa (IIA)**
>
> The Internet Initiative for Africa (IIA) was launched in 1996. It is a United Nations Development Programme (UNDP) project in partnership with African governments and the United Nations Economic Commission for Africa (UNECA). It provides Internet connectivity infrastructure, policy advice, and capacity building support to participating African countries that include Angola, Burkina Faso, Cape Verde, Chad, Ethiopia, Gambia, Mauritania, Namibia, Nigeria, and Swaziland.
>
> The programme is implemented through a cost-sharing partnership with the governments of these countries. The IIA programme, in many instances, established the first national Internet gateway, national backbone infrastructure, increased national bandwidths, and established Internet points of presence (POPs) in major cities. The IIA also provides policy and technical advisory services in addition to capacity building through the training of national experts to manage and administer the infrastructure. This is expected to facilitate long-term sustainability and growth.
>
> The IIA initiative was established due to the lack of adequate telecommunications infrastructure, the weak policy environment, and access to technologies and innovative business models in Sub-Saharan African countries. Rigid government regulations, artificially high telecommunications tariffs and the lack of appreciation of the potential of the role of the Internet in the development of the economy are regarded as major hindrances to social and economic development.
>
> So far the initiative has provided 10 countries with a stable Internet backbone or new Internet gateway, and enhanced connectivity through provision of POPs and tele- and training centres in major cities. It has assisted countries in developing a regulatory framework and establishing tariffs to facilitate the sustainable development. It has also provided an almost-free Internet access for education, research and health institutions in some countries and has trained a pool of professionals.
>
> *Source:* UNDP Presentation on IIA evaluation, at: http://www.undp.org/rba/ict4dev.html.

5.2   Mobilizing public-private partnerships

The perceived 'public good' aspects of increasing access to information and communication services has meant that civil society organizations and publicly-funded institutions are seeking to extend Internet access for underserved groups.[55] While these initiatives have been successful at achieving initial levels of connectivity and training, they have been criticized for being unsustainable, primarily because funding that is dependent on donor agencies is either inadequate or ends after a number of months or years. Despite, for example, a proliferation of e-learning partnerships, "it is a struggle to get beyond the pilot or ad hoc project stage and into sustainable services, with affordable and effective supply of content, services and equipment. One common response to this challenge is the quest for partnerships and collaborations, which can make this leap".[56]

One of the big challenges for the donor and technical assistance agencies is to alter their practices so that they can effectively mobilize and enter into the newer kinds of collaborative partnerships. This is difficult to achieve for many reasons. A recent in-depth study of two PPPs involving the International Development Research Centre (IDRC) provides a glimpse of one significant barrier to substantial change. This is the problem of the distribution of risk for the public and private partners in any partnership agreement, especially in cases where investment is expected to generate a commercial return.

In 1995, a new programme was launched in the IDRC office in Singapore to support ICT networking activities for developing countries in the Asia Pacific region The Pan Asia Networking programme was to provide donor financing for research on ICTs, while at the same time providing IDRC with an opportunity to experiment with partnership models involving the private sector. Boxes 5 and 6 highlight the features of two of these partnerships.[57]

The cases highlighted in Boxes 5 and 6 point up some key features that need to be considered when formulating partnerships. If an initiative is aimed at providing a commercial service, the public sector partner may place constraints on the relationship because of its public policy objectives. This may result in difficulties in implementation. Developing governance structures that do not place restrictive financial or legal risks on the public sector partner is likely to reduce the risk of failure.

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Box 5: Pan Lanka Networking

In 1995 Worldview International Foundation (WIF), an NGO based in Colombo, Sri Lanka, began discussions with the International Development Research Centre (IDRC) concerning the establishment of an ISP that would serve the development and research communities in Sri Lanka. The aim was to provide Internet access targeted to organizations working on development issues (primarily from the non-profit and public sectors) and to create the technical infrastructure that would host Sri Lankan research on issues of sustainable development. To ensure financial sustainability, customers would be attracted from the private sector, creating a financial base on which to support the development-related activities. Discussions began as to whether experimenting with a joint venture partnership, with a consortium of public and private partners, would be appropriate. An initial grant was provided to WIF by IDRC to develop a business plan.

The issue of IDRC holding equity in a private company raised a number of questions. As a Canadian Crown Corporation, IDRC was not restricted from holding equity in a private company, but legal liability posed difficulties. In 1996 it was determined that IDRC could not accept the legal risks involved. A compromise was reached such that IDRC would provide a grant to WIF and IDRC's shares in the joint venture company would be held in trust by WIF, until a final decision on equity ownership could be reached by IDRC.

Pan Lanka Pvt. Ltd. was launched in April 1997. The length of time it took to agree the partnership structure and registration of the company resulted in delays in the start-up of the ISP. Because of the changing market environment, prices for Internet access fell and more advanced Internet services were being offered by the competing ISPs. By the end of 1997, the customer base was growing, but not as fast as the initial business plan had anticipated. The competitive market meant that there was little time to focus on the development-related objectives.

In 1998 IDRC began to discuss strategies for withdrawing from the partnership. IDRC decided that it could not hold equity due to legal risk. The shares held in trust would be gifted to WIF, thereby converting the funds to a regular grant to a non-profit organization. The partnership concluded at the end of 1999. By 2002 Pan Lanka Networking had become a successful ISP offering a number of advanced services and according to its company profile, it retains its focus on supporting development-related ICT activities in Sri Lanka.

Source: Murray, 2002.

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Furthermore, joint ventures with equity ownership seem to be the most problematic for donor organizations. IDRC was one of the earliest publicly-funded donor agencies to develop and test several public-private partnership models for the delivery of Internet-based services in developing countries. It employed a mix of governance structures, which have led to the development of new services.

These examples suggest the need for a continuing public involvement to encourage growth in ICT services sector in some developing countries. In these cases, and others that are being developed today, the outcomes of partnerships ultimately depend on the incentives and motivations of each of the partners. Organizations wishing to engage in partnerships should undertake a full analysis of the possible incentives and constraints to implementation of the partnership during the negotiation process. This is more likely to lead to the development of a governance structure that best suits the needs of the public, private and other types of partners.

6   Designing information societies

The predominant 'information society' vision privileges the knowledge-driven economy and market-led developments. This is influencing investment in ICTs in the industrialized countries. In spite of the relatively high rates of investment in technologies and in their application, there are persistent problems in ensuring that ICT investment does contribute as expected to economic growth. There are also problems in ensuring that evidence of exclusion from participation in the information societies of these countries is addressed through appropriate policy measures. From the studies that are accumulating in these countries, it is clear that digital technologies cannot—by themselves—address or alter existing asymmetries in the distribution of economic and social resources.

The development and use of ICT systems and their applications must be accompanied by other measures, not least of which is investment in people's skills and capabilities and in organizational changes that people are willing to accept or absorb. This remains the case even where there is movement reasonably far along the ICT diffusion pathways. In the industrialized countries, the participation of a broad range of stakeholders in shaping their information societies continues to be a real problem.

There are many efforts to include 'users' in the early design phases of the new technologies and to include stakeholders in policy forums of many kinds. But there is still a tendency to assume that many of the issues are too technical for non-specialists to understand. Sometimes it is argued that so great a level of knowledge about the economy or the legal institutions is required, that many stakeholders cannot offer informed commentary. Nevertheless, efforts continue to be made to ensure that e-services supporting information societies are responsive to people's needs and preferences.

There is a general desire to work towards a distribution of capabilities for living in a technologically mediated society that is reasonably equitable. But the problem remains one of achieving this. Much of the effort in this area is being made through the coordination of public and private sector initiatives and through the efforts of civil society organizations of all kinds.

All these initiatives to construct socially and economically inclusive information societies are building on a substantial base of economic resources and capabilities in the industrialized countries as compared to those available in many developing countries. As one commentator argues[58], despite efforts to link investment in ICTs with development priorities, "developing countries have very little presence or influence in the many

voluntary, private, and not-for-profit decision-making forums that have been set up in recent years to standardize and manage the Internet and other new ICTs".

This analysis points to the need to create ICT policy awareness, to build both technical and policy capacity, to strengthen national policy institutions and processes, and to provide access to information about the international ICT policy agenda. There is also a need to improve the structure, functioning and working methods of international ICT policy forums and to make more effective use of financial resources available for participation by representatives of developing countries.

But even beyond these kinds of measures, in the case of initiatives for building distinctive information societies in the developing countries, there is a danger that the enthusiasm for investment in ICTs will overtake a clear vision of the social and economic purposes that such investments are intended to address. In the case of African Initiatives, as one commentator suggests,

> "A major part of this is the seemingly intractable challenge of creating an African-defined (even if not African-led) agenda … A further by-product of this challenge is the emerging possibility, albeit incipient, that there might be a genuine imbalance in the perception of critical (if not strategic) priorities in the urgent effort to build lasting and self-enhancing (read 'sustainable') ICT capacity in Africa".[59]

In a 1998 report on the nature of emerging 'knowledge societies' prepared for the United Nations Commission on Science and Technology for Development, it was observed that 'new coalitions of resources and partnerships among stakeholders, including the business sector, need to be encouraged *in line with each country's development priorities*".[60] This statement might now need to be extended to encompass the regional initiatives that have since been developed to address the persistent and growing evidence of 'digital divides' in all their manifestations. It is clear that overall development priorities must lead to investment in ICTs.

7 Conclusion

The key message that comes from a review of the experience of building information societies in industrialized countries is that, even with considerable resources, the 'digital divide' persists in some places and for certain categories of citizens. As experience across the world accrues, it is becoming evident that this divide cannot be reduced purely by relying on market-led forces. Various public, private, and civil society organization coalitions, whether under the label of partnerships or otherwise, have played and continue to play, a crucial role that influences the direction and rate of the ICT diffusion pathways. Similar coalitions of organizations operating within developing countries and in the poorest regions of the world are essential if there is to be a real chance of using ICTs and their applications to help address problems of poverty or to enable real participation in a globalizing world.

Current initiatives suggest that the message is being heard that financing ICT initiatives can indeed come from partnerships between private and other actors. However, the message that development priorities must come first is only partly being heard. Any vision and outcome of the World Summit on the Information Society (WSIS) must change this even if it cannot unlock sufficient resources to fully tackle all the features of the 'digital divide'.

One review of 'ICT-for-Development in Africa' initiatives, prepared for the UN ICT Task Force, argues that "an unintended and probably unanticipated challenge to the effective pursuit of ICT development in Africa is the plethora of initiatives, which threaten to overwhelm Africa's absorptive capacity".[61] This is a warning signal that needs to be listened to by those who focus too exclusively on technology and finance for ICTs.

It should also be remembered that the 'digital divide—in all of its many forms—is a manifestation of much deeper social and economic inequalities between the rich and poor peoples. For example, the global trading system is unfavourable to the developing world in many ways. It is difficult or impossible in many instances for citizens and companies to participate on equal terms in 'knowledge-driven' growth or in emerging ICT-based 'information societies'. We must expect these manifestations to remain as long as the focus is principally on ICTs without .[62] This is because a focus on ICTs will never be enough to address the deeper problems. The fundamental issues that hinder national social and economic development in the developing world and the poorer parts of industrialized societies must be addressed as a first priority. Perhaps the underlying motto is that ICTs can be a valuable enabler, but they are not the solution to deeper problems.

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1. See Department of Trade and Industry (1998), World Bank (1998) and Stiglitz (1999 a,b).

2. The World Summit on the Information Society (WSIS) website is at: http://www.itu.int/wsis.

3. Robin Mansell was a participant in an Expert Panel that contributed to the Strategy Unit report on electronic networks. She bears no direct responsibility for the views expressed in the report, but she supported many of the main arguments that are presented.

4. Strategy Unit (United Kingdom), 2002.

5. The definition of ICTs varies considerably. The OECD definition encompasses markets for hardware, packaged software and services as well as semiconductors. The ICT industry includes manufacturing (office, computing and accounting equipment); radio, television and communication equipment, and ICT services including communications services rendered to the public by post, wire or radio and services for the exchange or recording of messages, see OECD (2002c).

6. See Affuso and Waverman, 2002.

7. See Mansell and Nikolychuk, 2002.

8. See for example: Brynjolfsson and Hitt, 1996; Brynjolfsson and Yang, 1996; and Brynjolfsson and Kahin, 2002.

9. ICT spending refers to revenues paid to primary vendors and distribution channels for office machines, data processing systems, software and services by the final customer. Final customers include corporations, households, schools and government agencies. ICT investment refers to business sector investment in hardware, software, and communications equipment. It is calculated by subtracting household and government spending from total spending (See Daveri, 2001).

10. See Daveri, 2001.

11. Differences in ICT performance between the United States and Europe may be attributable to the differences in the use of price index methodologies, see Affuso and Waverman (2002) and Wyckoff (1995).

12. See Punie et al., 2002.

13. OECD, 2002a.

14. See Gareis, 2001; Millar, 2002a, b.

15. See Boden and Miles, 2000; Hawkins, 2001 a, b; Hawkins and Verhoest, 2002, and Mansell and Nioras, 2001.

16. See Nikolychuk, 1995.

17. See De Berranger et al., 2001.

18. See Asch, 2001.

19. See Hawkins and Verhoest, 2002.

20. United Nations, 2001.

21. See Siegried, 2001.

22. See Feindt et al., 2001.

23. European Information Technology Observatory (EITO), 2002.

24. See Coleman and Gøtze, 2000.

25. National Audit Office (NAO), 2002.

26. See Pratchett, 1999.

27. See Kinder, 2002.

28. See Hudson, 1999.

29. See Bourreau 2001.

30. See World Association of Newspapers (WAN), 2001; Punie et al., 2002.

31. See Nafus and Tracey, 2002.

32. See Katz and Aakhus, 2002.

33. See Livingstone and Bovill, 1999.

34. See Livingstone, 2002.

[35]   See Slevin, 2000; Tuomi, 2001.

[36]   Ducatel et al., 2000.

[37]   See Samarajiva et al., 2001.

[38]   Organisation for Economic Cooperation and Development (OECD), 2001b.

[39]   See EITO, 2002; OECD, 2002b.

[40]   See Johnson et al., 2002.

[41]   See Smith, 2001.

[42]   See Fransman, 2001.

[43]   See Kaul et al., 1999; Stiglitz, 1999.

[44]   See Kemshall and Ross, 2000.

[45]   See OECD, 1999.

[46]   See Crosslin, 1991.

[47]   See Nelson and Zadek, 2000.

[48]   See Nelson, 1996.

[49]   See Board on Science, Technology and Economic Policy (STEP), 2002.

[50]   DOT Force, 2001.

[51]   See Global Knowledge Partnership (GKP), 2000.

[52]   United Nations, 2000.

[53]   Murray et al., 2002.

[54]   See Bates, 1998; Hjerppe, 1997; Kaul et al., 1999.

[55]   See Bridges.org, 2001.

[56]   OECD, 2001a.

[57]   See Murray, 2002.

[58]   See MacLean et al., 2002.

[59]   Okpaku, 2002.

[60]   Note: emphasis added. Mansell and When, 1998.

[61]   Okpaku, 2002.

[62]   See Humphrey, Mansell et al., 2003 (forthcoming).