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eBusiness Trends



A weekly newsletter from IDC

August 24, 2000 - No. 21

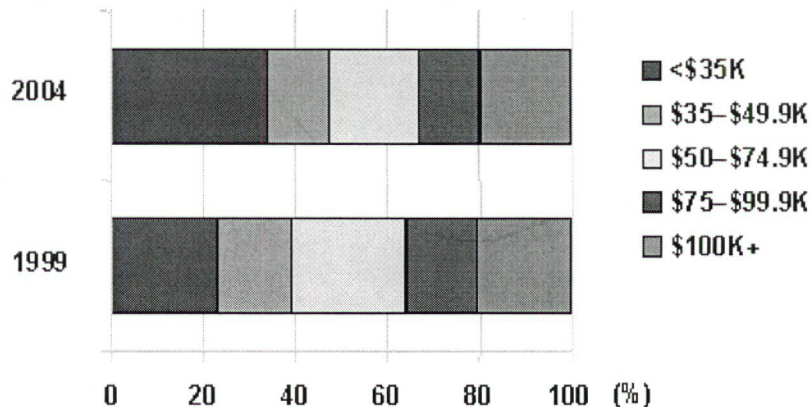
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Digital Divide Dissipating?

Perhaps the digital divide in the United States won't be as dire as some have predicted. By 2004, the U.S. population with online access to the Internet will more closely resemble the overall U.S. population (see Figure 1).

Figure 1 - Percentage of U.S. Online Households by Annual Income, 1999 and 2004

Percentage of U.S. Online Households by Annual Income, 1999 and 2004



Source: IDC #22653, July 2000

By 2004, 68.6% of U.S. households will be online, up from 35.5% in 1999 (see Figure 2). These numbers indicate that the online penetration rate is higher than that of cable TV in 1999. And, come to think of it, a PC and Internet access cost about the same as a new TV and cable service. Hmmm...

In every household income category, more than 58% of U.S. households will be online in 2004. An online household subscribes to one or more forms of Internet access, including proprietary online services such as AOL.

The democratization of the Internet in the United States means marketers should

seriously plan on the Internet as a channel to reach customers, according to *The Next Wave of U.S. Online Users: Forecast and Analysis, 2000–2004* (IDC #22653, July 2000).

In particular, segments such as health, beauty, and housewares may supersede books and high-tech articles as popular items sold via the Web.

Big Growth Areas

When one slices and dices the data by different demographic factors, the sectors showing the fastest growth rates are the sub-\$35,000 annual income sector and the 55+ age group, which are not mutually exclusive.

In fact, some households with annual incomes of less than \$35,000 consist of retirees who may have savings but not income in excess of that amount; this income group also includes many newly formed households.

The category of households with less than \$35,000 annual income will increase at a compound annual growth rate (CAGR) of 24.4% between 1999 and 2004 and contribute 45%, or 16.7 million, of the 37.1 million new households going online between 1999 and 2004.

The number of online households in the sub-\$35,000 category will more than triple from 8.4 million in 1999 to 25.1 million in 2004.

The online adult population over 55 years of age will include the first wave of baby boomers by 2004 and increase at a CAGR of 25.2% between 1999 and 2004. For the same time period, the overall population of those over 55 years of age will increase at a mere 2.2% CAGR.

Some factors contributing to the growth in online households include low-cost PCs (\$300), provision of low-cost PCs and Internet access by employers such as Ford and Delta, and growing availability of free online service.

IDC's forecast of online users in the United States ties to U.S. Census Bureau estimates, and projections for households and the workforce are based on government estimates. The forecast of households by income is based on projections by Claritas.

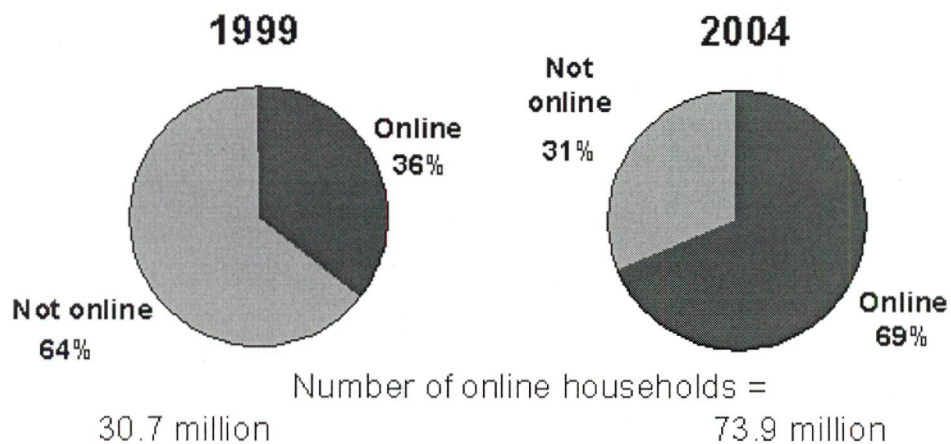
Opportunity Knocks

Companies that want to reach the mass market should consider the following tips when planning their marketing efforts:

- Assign resources to capture those coming online for the first time
- Incorporate the Internet in marketing campaign, but remember it's a network, not a broadcast medium
- Assume your current customers are already online when you market to them or give them a reason to go online
- Court the aging population as well as those with more limited incomes

Figure 2 - U.S. Online Households, 1999 and 2004

U.S. Online Households, 1999 and 2004



Source: IDC #22653, July 2000

— Molly Upton

Related Research

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IDC's Internet Executive Forum

September 28-29, 2000
San Francisco, California

Fm: Menzie Chinn

Date: 4 August 2000

Re: The Rationale for Development Assistance for IT Investment (Draft)

Outline

1. Overview
2. The Economic Rationale
3. Some Critiques and Responses

1. Overview

The Okinawa Charter on the Global Information Society has prompted some critical reviews. In particular, some observers have raised issue with the priority given to closing the international digital divide, as opposed to other initiatives. The specific question is why one should favor this form of resource transfer over others. Below, the economic rationale for development assistance devoted to information and communication technology (IT) related areas is discussed. Some criticisms of the reasoning underpinning the Charter are also addressed.

2. The Economic Rationale

2.1. Why Focus on IT in Particular?

The reason for focusing on IT is that the rate of return on IT related activities is perceived to be extremely high. In order to rationalize why development assistance (or government intervention at all) is needed, one must appeal to the observation of market failures (externalities) and imperfections (monopoly, asymmetric information) in less developed countries. Externalities may explain why labor, and human and physical capital do not move to the activity where they will receive the highest *social* rate of return. Even in the absence of market failures, market imperfections – perhaps most significantly in credit and capital markets – may lead to under-investment in certain activities.

While such imperfections can cause under-investment in all types of activities economic theory suggests that these imperfections may be very pronounced in activities involving IT. Much of the capital associated with IT-related businesses is intangible in nature – that is only a portion of the worth of a firm is embodied in the physical plant, while a large amount may be embodied in the organization and operating procedures of the firm. In this case, it is more difficult to “monitor” the management of the firm, and hence lenders will require an even higher rate of return than would occur if no asymmetric information existed.

In assessing the case for the G-8 initiative, one is hampered by the lack of quantitative evidence on the benefits and costs of IT-related activities. This comes as no surprise given the relative novelty of the internet and other IT in the developing world. However, there is a substantial body of work addressing a sector that is widely perceived to be analogous to IT – namely telecommunications.

There are externalities associated with having a network through which information can be widely transmitted -- the benefits to society of having an individual firm connected to the phone system exceeds the benefits accruing to that single firm; however, that single firm only invests in phone service up to the point where the cost of the last unit of phone service equals its *private* (not social) benefit of the last unit of phone service. Thus, in this situation, there is under-investment in telecommunications.

The standard policy prescription is for government intervention to internalize the externalities, preferably by a subsidy. Failing that, a properly managed state-owned enterprise can in principle accomplish the task, although not necessarily with the same degree of efficiency.

Unfortunately, most state-owned enterprises in less developed countries are part of the problem, rather than part of the solution (particularly in Africa; see Oshikoya and Hussain, 1998). These entities seldom internalize externalities, but instead provide services inefficiently (technically and economically). Presumably, leaving the development of IT to the market or state would lead to a similar state of affairs. Hence, the argument for intervention.

2.2 The Link from Telecoms to IT

In the least developed countries, establishment of an efficient and extensive telecom infrastructure is a prerequisite for rapid diffusion of internet connectivity. Hence, the most concrete action the G-8 countries can take that will foster IT in developing economies is included in the Charter: "...mobilising resources to improve information and communications infrastructure" (G-8, para. 19). Development assistance of either a technical, managerial, or financial form can be used to assist governments in either reforming their state-owned telecoms, or preferably, privatizing them while simultaneously establishing effective regulatory agencies.¹

The importance of the communications infrastructure to the development of internet use is illustrated by the following study. Using a cross-country data set on 153 countries in 1995, Canning estimated a series of regressions using various measures of internet activity: (i) number of packets; (ii) number of internet hosts; and (iii) the number of internet users.

For countries with internet activity, he found that:

- After controlling for population and income per capita, and the monthly cost of a line, the elasticity of packets with respect to number of main telephone lines per capita is 0.785, and statistically significant at the 1% MSL (Canning, 1999a, Table 1). A fuller specification yields a higher point estimate (1.036) that is only marginally significant.

¹ Goldstein and O'Conner (2000) note that more than 90 developing economies opened their telecom sector between 1990 and 1998. Thus the Charter's emphasis on pro-competitive policies can be viewed as an extension of the current trend toward deregulation.

² Mann (2000: 9) makes explicit the point that other aspects of infrastructure cannot be ignored. Taking advantage of the opportunities afforded by e-commerce, for instance, will require both an efficient telecommunications network and the transportation infrastructure necessary to deliver the goods.

- The number of internet hosts does not depend upon the number of main lines per capita, but does depend negatively upon the number of faults per main line (that is, the interruptions to service), and positively upon the number of digital phone lines (Canning, 1999a, Table 4).

For the *full* sample, including countries that didn't have internet activity:

- After controlling for population and income per capita, the number of main lines per capita is a statistically significant determinant of whether there is any internet activity, regardless of whether the measure is the number of packets or the number of hosts.
- A ten percent increase in the number of main lines per capita increases the likelihood of internet activity by between 2.6% and 3.0% (Canning, 1999a, Table 5).

Hence, a substantive component of the Charter would be a renewed emphasis on reforming and improving the telecommunications sector in developing countries.

3. Some Critiques and Responses

- *Critique: Debt relief would be a superior form of assistance, as compared to additional resource commitments for IT investment.*

Response: This criticism requires careful analysis in order to respond correctly. First, it is important to remember that no country has indicated that it would decrease funds for debt reduction in exchange for additional funding for the DOT force initiative.

Second, to the extent that the *additional* resources represented by DOT-force funds could be devoted instead to debt relief, one needs to ask to what end those funds freed up by debt relief will go to. If the funds go to subsidize consumption for urban groups, for instance, then recipient countries will again accumulate debt without appreciable acceleration in growth. If the funds instead go to finance health and education expenditures, then substantial gains to economic growth will occur over time. A similar argument can be applied to investment in basic infrastructure.

However, a dollar's worth of investment in IT (interpreted as internet connectivity) is likely to yield a greater rate of return than a dollar's worth of investment in other infrastructure. No plausible estimates for the social rate of return on internet investments exist; however Canning (1999b) extrapolates from the experience with the expansion of telephony. Citing the 1994 *World Development Report*, he notes that the average financial rate of return of telecommunications projects was approximately 20%, a relatively high number even when compared to private rates of return.

To some extent, one is more concerned with economic growth, rather than financial rates of return. Using data on a panel of 57 countries over at least 20 years, he obtains a point estimate of 0.139 for the elasticity of output-per-worker with respect to main phone lines per worker, holding the capital stock constant. However, the telecommunications related capital stock is

included in the aggregate capital stock number, implying that a unit of telecommunications capital has a higher marginal product than a generic unit of capital.³

● *Critique: The DOT force initiative is the most recent in a line of inappropriate technology fads. Without the infrastructure to supply a consistent power supply or relatively fault-free telephone system, efforts to raise interconnectivity will result in wasted equipment.*

Response: Substantial gains can be achieved even without networking the entire country. Introduction of IT into certain key government agencies might enhance LDC welfare too. For instance, a \$1 million investment in Mauritania reducing the customs processing time from 48 hours to 30 minutes, and the time to declare goods, 5 to 20 days down to one or two. A pilot program in Colombia reduced customs related transactions costs by 40% days (cited in Talero and Gaudette, 1996).

● *Critique: E-Commerce is an infeasible proposition for least developed countries; even when the infrastructure might be able to sustain e-commerce, the lack of computer literacy, the absence of effective protection for property rights and accompanying legal sanctions, will constitute insurmountable barriers.*

Response: There is some anecdotal evidence indicating the e-commerce can take place even without many of these pre-requisites existing in full force.

“○ A women’s weaving cooperative in an isolated village in Guyana is selling its principal product, hammocks, over the internet for \$1000 each.

○ In Peru, indigenous Ashaninkas use public Internet booths to sell their crafts over the Web.

○ A man in New York has created an Internet company thorough which immigrants from Ghana can buy goats for their families and villages back home.

○ Firms in Africa can now access and bid on procurement contracts tendered by General Electric.” (examples cited in Mann, Eckert, Knight, 2000, p. 178-79).

Additional examples are cited in UN (2000, Box 1).

As indicated by the examples cited above, the fostering of widespread e-commerce is not amenable to large, top-down investment projects. Even if access is provided, individuals and firms will not incur the access costs if the benefits of internet use are not made clear to them. While it is not clear that we know how demonstrate these benefits, Mann, Eckert and Knight (2000) cite a number of encouraging examples. In Thailand, e-commerce firms have been incubated through the use of industrial parks; in Morocco and Thailand, internet systems have been upon previously existing networks of franchises.⁴ These small-scale interventions indicate

³ Additional surveys of the impact of telecommunications investment on output, consumer welfare, wages and income distribution are described in Bedi (1999).

⁴ Conversation with Catherine Mann (August 4, 2000).

that development assistance from a variety of sources can accelerate the adoption of information and communication technologies in less developed countries.

- *Critique: Even if e-commerce thrives, attempts to bridge the information gap will founder upon the lack of technical support for the equipment.*

Response. This is a substantive critique. On the hardware and software side, the threat is not pronounced because the various providers of IT related goods (Cisco, Microsoft) have found it in their own interest to invest in substantial training programs, so that their equipment and network systems are properly maintained.⁵ However, on the education side, the externalities from transferring knowledge are so great that the private sector does not have an incentive to invest in training for the use of IT in educational purposes.

The Japanese initiative addresses this concern by committing part of the \$15 billion expenditures to “[t]he education and training of technical experts to introduce and make use of IT...in developing developing countries.” (GoJ, 2000).

⁵ Conversation with Catherine Mann (August 4, 2000).

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(8/22/00)

Why Information Technology is Important for the Developing World

The IT Gap between Developed and Developing Countries is Large and Growing

- In March 2000, an estimated 276 million people worldwide were users of the Internet, with a growth rate of roughly 150,000 persons per day, 220 million devices were accessing the world wide web and 200,000 devices added each day. Web pages totaled 1.5 billion with almost 2 million pages added each day. Global electronic commerce is projected to reach \$7 trillion by 2004.
- But these dramatic numbers reflect the activity of less than 5 percent of the world's population. Fewer than 5 percent of the computers connected to the Internet are in developing countries. Compared with the developed world which has 56.7 phone lines per 100 people, low-income countries have just 3.7 phones per hundred people. Half the people on the planet have never made a telephone call.
- The disparity between digital haves and digital have nots is a source of concern because Information Technology can play a critical role in a country's overall economic development, public health, education and civil society. In order to enhance the economic development of low-income countries, it is therefore important and necessary to take steps to address this digital divide

Why Should Development Assistance Focus on Telecoms and IT?

- Recent econometric studies have found evidence of a strong link between telecommunications development and economic development. Each one percent increase in the number of phone lines per worker combined with a one percent increase in capital per worker leads to a half percent increase in labor productivity in developing countries (Canning, 1999b)¹.
- This finding also applies to least developed countries. The low rate of telecommunications development is found to be a significant factor in helping explain Africa's overall slow growth rates. A McKinsey study argues that adding one new telephone to the network in countries with a GNP per capita of \$100 adds \$12,000 to the GNP.²
- Similarly, the rate of return on IT related activities is extremely high. It is too early to quantify the returns to the spread of the internet in developed countries. Indeed, only now are

¹ Another way of putting this is that a one percent increase in telephone lines per worker, holding capital constant, yields a 0.14% increase in labor productivity.

² See Bedi (1999) for discussion of other effects of telecommunications on output, wages, prices and income distribution. The development of an efficient telecommunications sector is also important because telephone line density and cost are key determinants of internet activity (after controlling for income per capita). See Canning (1999a), and Mann (2000).

the benefits from investing in computing technology and staff becoming apparent, but they are very substantial. The rate of return on a dollar's worth of computer capital is 48%, compared to 6-7% on non-computer capital (Brynjolfsson and Hitt, 1996).

- Extensive studies of returns to IT have not yet been carried out in developing countries. However, there are strong reasons to believe that returns should be as high or even higher than those of basic telecommunications services. These include the greater ability of the Internet to provide tailored information, to provide this information to thousands at the same time and to reduce cost of search on the network.
- In Uganda --which is one of the initial Internet for Economic Development Initiative (IED) countries -- USAID, the FCC and the Uganda Communication Commission (UCC) are cooperating to allow competition for telecommunication services. Since the break-up of the telecommunications monopoly in 1997 and the subsequent sale of telecom shares to the public, cellular telephone prices have decreased and usage has increased dramatically. Before liberalization, users paid \$2,000 to obtain a mobile phone line but now pay only \$100. The number of cellular telephone owners has increased from 20,000 to 70,000 and the number of fixed line subscribers has gone from 40,000 to 60,000 in the same period.
- In India, the development of the software and services industry has been a major source of economic growth. Over 200,000 professional jobs have been created in IT-related activities. Exports from software and services sector earn \$40 million a week. (UN Report)
- Substantial gains can be achieved even without networking the entire country. Introduction of IT into certain key government agencies might enhance LDC welfare too. For instance, a \$1 million investment in Mauritania reducing the customs processing time from 48 hours to 30 minutes, and the time to declare goods, 5 to 20 days down to one or two. A pilot program in Colombia reduced customs related transactions costs by 40% (cited in Talero and Gaudette, 1996).
- The Internet can allow businesses to save substantial costs. If a Mozambican business were to telephone the U.K. for an hour each business day, it would cost \$38,250 over the course of a year. Faxing that same information would cost \$7,650. All the yearly costs of a regional Internet connection -- a computer, modem and Internet access -- used for international email alone as a substitute for fax traffic would amount to \$1,328. The yearly savings over fax use would be \$6,322. (World Bank, undated).
- A small import-export company in Tanzania now uses 10-cent mail messages and \$1 e-mail-to-fax gateways instead of \$20 faxes to place orders for products in North America and Europe. As a result, the company has seen its telecoms bill go from over \$500 each month to \$45 each month
- An ISP was established in 1996 in a remote village near Chineros, Peru, with the help of local NGOs, the Agriculture Ministry and UNDP. By using the Internet connection, the council of village leaders established a business relationship with an international company

in New York and arranged for their products to be shipped and sold in New York. The villagers' income has jumped from just \$300 a month to \$1500.

- IT investments can also have dramatic effects on the efficiency and effectiveness of governments in developing countries. Computerizing the tax system in the Philippines increased revenue collection and decreased administrative costs. The project is estimated to have an internal rate of return of 250%. (world bank case study).
- IT investments can also yield significant benefits in areas such as agriculture, education, environmental protection, tourism and health care.
 - Agriculture: Through access to timely information, IT can help determine harvesting times, improve food supply, locate sources of surplus, coordinate distribution channels and storage facilities.
 - Education: IT can help provide more equitable access for remote regions to resources and provide distance education to improve local educational capacity.
 - Environmental protection: IT networks can help coordinate environmental monitoring of areas threatened by environmental degradation and natural disasters.
 - Tourism: High quality connectivity can help attract more tourists to a destination and can also be used in marketing and promoting a country's tourist destinations.
 - IT can promote access to skilled health care professionals for expert diagnosis; it can help coordinate medical transportation and supplies to enhance patient access to quality care.

Why Shouldn't This Be Left to the Market?

- Despite this high potential return on investment, market imperfections – particularly in the credit and capital markets – can lead to a significant underinvestment in IT in less-developed countries. For instance, consider the choices facing an entrepreneur in a least developed country, trying to establish a telephone network. In many such economies, a well functioning stock market is non-existent, as is a corporate bond market. Then one recourse is to borrow funds from a bank. However, especially in ventures where the performance and abilities of the firm's management are very difficult to monitor, the bank will be extremely wary of providing the funds necessary to undertake the investment. Indeed, even if any funds are provided, they may be at terms so exorbitant that the entrepreneur or small firm is unable to justify the investment.
- Even when labor and capital *do* respond to wages and returns, they might be reacting to private, not social, benefits and costs. When the benefit/cost ratio facing an individual, or a firm, is different than that facing society at large, then the market might either cause too much of an activity to be undertaken (pollution), or too little (education). IT-related activities are widely believed to fall into the latter category (in the jargon, they possess "network externalities"). For instance, when an individual firm establishes a connection to a phone system, it benefits; however, society at large also benefits additionally because of the ease with which information can now travel between the rest of society and that firm.

- A concrete manifestation of these two effects is illustrated by the Grameen Bank's initiative in Bangladesh. Bangladesh has one of the lowest telephone densities in the world – 0.26 lines per 100 people (compare to India at 1.00). The Grameen Bank cooperated in a joint venture that leased cellular phones to successful members who then sold telecommunication services to other villagers. While it is difficult to make a rate of return comparison (given the lack of data on the cost of capital, and the alternative uses of the lessee's time), the average net profit was between 20 to 25 percent of total household income. In the absence of the Grameen Bank initiative, none of this investment would have occurred (Bayes, et al., 1999).

Wouldn't Debt Relief for Poor Countries Be a Superior Form of Assistance to IT Investments?

- First, resources for the DOT *force* would be in addition to those committed to debt.
- Second, to the extent that the *additional* resources represented by DOT-*force* funds could be devoted instead to debt relief, one needs to ask to what end those funds freed up by debt relief will go to. The resources that would be dedicated for these initiatives would be targeted at specific activities with a known high rate of payoff. If the resources freed up by debt relief were instead to be devoted to subsidizing consumption (gasoline is a common example), then recipient countries will again accumulate debt without appreciable acceleration in growth. If the funds instead go to finance health and education expenditures, or other investment in basic infrastructure, then substantial gains to economic growth will occur over time. At the moment, no country has actually been fully approved [check] for debt relief through the enhanced HIPC process, so assessment of relative costs and benefits cannot be made. It therefore seems prudent to tackle LDC problems through a variety of means.
- **Thirdly, a dollar's worth of investment in IT (interpreted as Internet connectivity) is likely to yield a greater rate of return than a dollar's worth of investment in other infrastructure.** No plausible estimates for the social rate of return on Internet investments exist; however one can extrapolate from the experience with the expansion of telephony. Citing the 1994 *World Development Report*, one economist estimated that the average financial rate of return of telecommunications projects was approximately 20%, a relatively high number even when compared to private rates of return. (Canning, 1999b)
- A unit of IT related investment is likely to yield a higher return than a unit of ordinary investment. One recent study indicates that telephone related investment is more productive than generic physical investment in plant and equipment (Canning, 1999b).

Isn't E-Commerce an infeasible proposition for least developed countries? Even when the infrastructure might be able to sustain e-commerce, the lack of computer literacy, the absence of effective protection for property rights and accompanying legal sanctions, will constitute insurmountable barriers.

- There is some anecdotal evidence indicating the e-commerce can take place even without many of these pre-requisites existing in full force.

- A women's weaving cooperative in an isolated village in Guyana is selling its principal product, hammocks, over the internet for \$1000 each.
- In Peru, indigenous Ashaninkas use public Internet booths to sell their crafts over the Web.
- A man in New York has created an Internet company thorough which immigrants from Ghana can buy goats for their families and villages back home.
- Firms in Africa can now access and bid on procurement contracts tendered by General Electric." (examples cited in Mann, Eckert, Knight, 2000, p. 178-79).
- As indicated by the examples cited above, the fostering of widespread e-commerce is not amenable to large, top-down investment projects. Even if access is provided, individuals and firms will not incur the access costs if the benefits of internet use are not made clear to them. While it is not clear that we know how demonstrate these benefits, Mann, Eckert and Knight (2000) cite a number of encouraging examples. In Thailand, e-commerce firms have been incubated through the use of industrial parks; in Morocco and Thailand, internet systems have been upon previously existing networks of franchises.³ These small-scale interventions indicate that development assistance from a variety of sources can accelerate the adoption of information and communication technologies in less developed countries.

Won't the information gap persist because of the lack of technical support for the equipment?

- This is a substantive critique. On the hardware and software side, the threat is not pronounced because the various providers of IT related goods (Cisco, Microsoft) have found it in their own interest to invest in substantial training programs, so that their equipment and network systems are properly maintained.⁴ However, on the education side, the externalities from transferring knowledge are so great that the private sector does not have an incentive to invest in training for the use of IT in educational purposes.
- That is why training and capacity development is a key pillar of U.S. Government initiatives, including the Leland Project and the Internet for Economic Development Initiative which encourages the deployment of the Internet and E-Commerce in developing countries.
- Similarly, the G-8 DOT-force plans include a commitment to the development of local expertise. The Japanese initiative also partially addresses this concern by committing part of the \$15 billion expenditures to "[t]he education and training of technical experts to introduce and make use of IT...in developing developing countries." (GoJ, 2000).

³ Conversation with Catherine Mann (August 4, 2000).

⁴ Conversation with Catherine Mann (August 4, 2000).

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Okinawa Charter on Global Information Society

1. Information and Communications Technology (*IT*) is one of the most potent forces in shaping the twenty-first century. Its revolutionary impact affects the way people live, learn and work and the way government interacts with civil society. *IT* is fast becoming a vital engine of growth for the world economy. It is also enabling many enterprising individuals, firms and communities, in all parts of the globe, to address economic and social challenges with greater efficiency and imagination. Enormous opportunities are there to be seized and shared by us all.
2. The essence of the *IT*-driven economic and social transformation is its power to help individuals and societies to use knowledge and ideas. Our vision of an information society is one that better enables people to fulfil their potential and realise their aspirations. To this end we must ensure that *IT* serves the mutually supportive goals of creating sustainable economic growth, enhancing the public welfare, and fostering social cohesion, and work to fully realise its potential to strengthen democracy, increase transparency and accountability in governance, promote human rights, enhance cultural diversity, and to foster international peace and stability. Meeting these goals and addressing emerging challenges will require effective national and international strategies.
3. In pursuing these objectives, we renew our commitment to the principle of inclusion: everyone, everywhere should be enabled to participate in and no one should be excluded from the benefits of the global information society. The resilience of this society depends on democratic values that foster human development such as the free flow of information and knowledge, mutual tolerance, and respect for diversity.
4. We will exercise our leadership in advancing government efforts to foster an appropriate policy and regulatory environment to stimulate competition and innovation, ensure economic and financial stability, advance stakeholder collaboration to optimise global networks, fight abuses that undermine the integrity of the network, bridge the digital divide, invest in people, and promote global access and participation.
5. Above all, this Charter represents a call to all, in both the public and private sectors to bridge the international information and knowledge divide. A solid framework of *IT*-related policies and action can change the way in which we interact, while promoting social and economic opportunities worldwide. An effective partnership among stakeholders, including through joint policy co-operation, is also key to the sound development of a truly global information society.

Seizing Digital Opportunities

6. The potential benefits of *IT* in spurring competition, promoting enhanced productivity, and creating and sustaining economic growth and jobs hold significant promise. Our task is not only to stimulate and facilitate the transition to an information society, but also to reap its full economic, social and cultural benefits. To achieve this, it is important to build on the following key foundations:
 - Economic and structural reforms to foster an environment of openness, efficiency, competition and innovation, supported by policies focusing on adaptable labour markets, human resource development, and social cohesion;
 - Sound macroeconomic management to help businesses and consumers plan confidently for the future and exploit the advantages of new information technologies;
 - Development of information networks offering fast, reliable, secure and affordable access through competitive market conditions and through related innovation in network technology, services and applications;
 - Development of human resources capable of responding to the demands of the information age through education and lifelong learning and addressing the rising demand for *IT* professionals in many sectors of our economy;
 - Active utilisation of *IT* by the public sector and the promotion of online delivery of services, which are essential to ensure improved accessibility to government by all citizens.
7. The private sector plays a leading role in the development of information and communications networks in the information society. But it is up to governments to create a predictable, transparent and non-discriminatory policy and regulatory environment necessary for the information society. It is important to avoid undue regulatory interventions that would hinder productive private-sector initiatives in creating an *IT*-friendly environment. We should ensure that *IT*-related rules and practices are responsive to revolutionary changes in economic transactions, while taking into account the principles of effective public-private sector partnership, transparency and technological neutrality. The rules must be predictable and inspire business and consumer confidence. In order to maximise the social and economic benefits of the Information Society, we agree on the following key principles and approaches and commend them to others:

- Continue to promote competition in and open markets for the provision of information technology and telecommunications products and services, including non-discriminatory and cost-oriented interconnection for basic telecommunications;
- Protection of intellectual property rights for *IT*-related technology is vital to promoting *IT*-related innovations, competition and diffusion of new technology; we welcome the joint work already underway among intellectual property authorities and further encourage our experts to discuss future direction in this area;
- Governments' renewed commitment to using software in full compliance with intellectual property rights protection is also important;
- A number of services, including telecommunications, transportation, and package delivery are critical to the information society and economy and improving their efficiency will maximise benefits; customs and other trade-related procedures are also important to foster an *IT*-friendly environment;
- Facilitate cross-border e-commerce by promoting further liberalisation and improvement in networks and related services and procedures in the context of a strong World Trade Organisation (WTO) framework, continued work on e-commerce in the WTO and other international fora, and application of existing WTO trade disciplines to e-commerce;
- Consistent approaches to taxation of e-commerce based on the conventional principles, including neutrality, equity and simplicity, and other key elements agreed in the work of the Organisation for Economic Co-operation and Development (OECD);
- Continuing the practice of not imposing customs duties on electronic transmissions, pending the review at the next WTO Ministerial Conference;
- Promotion of market-driven standards including, for example, interoperable technical standards;
- Promote consumer trust in the electronic marketplace consistent with OECD guidelines and provide equivalent consumer protection in the online world as in the offline world, including through effective self-regulatory initiatives such as online codes of conduct, trustmarks and other reliability programmes, and explore options to alleviate the difficulties faced by consumers in cross-border disputes, including use of alternative dispute resolution mechanisms;
- Development of effective and meaningful privacy protection for consumers, as well as protection of privacy in processing personal data, while safeguarding the free flow of information, and;
- Further development and effective functioning of electronic authentication, electronic signature, cryptography, and other means to ensure security and certainty of transactions.

8. International efforts to develop a global information society must be accompanied by co-ordinated action to foster a crime-free and secure cyberspace. We must ensure that effective measures, as set out in the OECD Guidelines for Security of Information Systems, are put in place to fight cyber-crime. G8 co-operation within the framework of the Lyon Group on Transnational Organised Crime will be enhanced. We will further promote dialogue with industry, building on the success of the recent G8 Paris Conference "A Government/Industry Dialogue on Safety and Confidence in Cyberspace". Urgent security issues such as hacking and viruses also require effective policy responses. We will continue to engage industry and other stakeholders to protect critical information infrastructures.

Bridging the Digital Divide

9. Bridging the digital divide in and among countries has assumed a critical importance on our respective national agendas. Everyone should be able to enjoy access to information and communications networks. We reaffirm our commitment to the efforts underway to formulate and implement a coherent strategy to address this issue. We also welcome the increasing recognition on the part of industry and civil society of the need to bridge the divide. Mobilising their expertise and resources is an indispensable element of our response to this challenge. We will continue to pursue an effective partnership between government and civil societies responsive to the rapid pace of technological and market developments.
10. A key component of our strategy must be the continued drive toward universal and affordable access. We will continue to:
 - Foster market conditions conducive to the provision of affordable communications services;
 - Explore other complementary means, including access through publicly available facilities;
 - Give priority to improving network access, especially in underserved urban, rural and remote areas;
 - Pay particular attention to the needs and constraints of the socially under-privileged, people with disabilities, and older persons and actively pursue measures to facilitate their access and use;

- Encourage further development of “user-friendly”, “barrier-free” technologies, including mobile access to the Internet, as well as greater utilisation of free and publicly available contents in a way which respects intellectual property rights.
11. The policies for the advancement of the Information Society must be underpinned by the development of human resources capable of responding to the demands of the information age. We are committed to provide all our citizens with an opportunity to nurture *IT* literacy and skills through education, lifelong learning and training. We will continue to work toward this ambitious goal by getting schools, classrooms and libraries online and teachers skilled in *IT* and multimedia resources. Measures aiming to offer support and incentives for small-to-medium-sized enterprises and the self-employed to get online and use the Internet effectively will also be pursued. We will also encourage the use of *IT* to offer innovative lifelong learning opportunities, particularly to those who otherwise could not access education and training.

Promoting Global Participation

12. *IT* represents a tremendous opportunity for emerging and developing economies. Countries that succeed in harnessing its potential can look forward to leapfrogging conventional obstacles of infrastructural development, to meeting more effectively their vital development goals, such as poverty reduction, health, sanitation, and education, and to benefiting from the rapid growth of global e-commerce. Some developing countries have already made significant progress in these areas.
13. The challenge of bridging the international information and knowledge divide cannot, however, be underestimated. We recognise the priority being given to this by many developing countries. Indeed, those developing countries which fail to keep up with the accelerating pace of *IT* innovation may not have the opportunity to participate fully in the information society and economy. This is particularly so where the existing gaps in terms of basic economic and social infrastructures, such as electricity, telecommunications and education, deter the diffusion of *IT*.

14. In responding to this challenge, we recognise that the diverse conditions and needs of the developing countries should be taken into account. There is no “one-size-fits-all” solution. It is critically important for developing countries to take ownership through the adoption of coherent national strategies to: build an *IT*-friendly, pro-competitive policy and regulatory environment; exploit *IT* in pursuit of development goals and social cohesion; develop human resources endowed with *IT* skills; and encourage community initiatives and indigenous entrepreneurship.

The Way Forward

15. Efforts to bridge the international divide, as in our societies, crucially depend on effective collaboration among all stakeholders. Bilateral and multilateral assistance will continue to play a significant role in building the framework conditions for *IT* development. International Financial Institutions (IFIs), including Multilateral Development Banks (MDBs), particularly the World Bank, are well placed to contribute in this regard by formulating and implementing programmes that foster growth, benefit the poor, as well as expand connectivity, access and training. The International Telecommunications Union (ITU), the United Nations Conference on Trade and Development (UNCTAD) and the United Nations Development Programme (UNDP) and other relevant international fora, also have an important role to play. The private sector remains a central actor driving *IT* forward in developing countries and can contribute significantly to the international efforts to bridge the digital divide. NGOs, with their unique ability to reach grassroots areas, can usefully contribute to human resource and community development. *IT*, in short, is global in dimension, and thus requires a global response.
16. We welcome efforts already underway to bridge the international digital divide through bilateral development aid and by international organisations and private groups. We also welcome contributions from the private sector, such as those of the Global Digital Divide Initiative of the World Economic Forum (WEF), the Global Business Dialogue on E-Commerce (GBDe), and the Global Forum.
17. As highlighted by the UN Economic and Social Council (ECOSOC) Ministerial Declaration on the role of *IT* in the context of a knowledge-based global economy, there is a need for greater international dialogue and collaboration to improve the effectiveness of *IT*-related programmes and projects with developing countries, and to bring together the “best practices” and mobilise the resources available from all stakeholders to help close the digital divide. The G8 will seek to promote the creation of a stronger

partnership among developed and developing countries, civil society including private firms and NGOs, foundations and academic institutions, and international organisations. We will also work to see that developing countries can, in partnership with other stakeholders, be provided with financial, technical and policy input in order to create a better environment for, and use of, *IT*.

18. We agree to establish a Digital Opportunity Taskforce (*dot force*) with a view to integrating our efforts into a broader international approach. To this end, the *dot force* will convene as soon as possible to explore how best to secure participation of stakeholders. This high-level Taskforce, in close consultation with other partners and in a manner responsive to the needs of developing countries, will:

- Actively facilitate discussions with developing countries, international organisations and other stakeholders to promote international co-operation with a view to fostering policy, regulatory and network readiness; improving connectivity, increasing access and lowering cost; building human capacity; and encouraging participation in global e-commerce networks;
- Encourage the G8's own efforts to co-operate on *IT*-related pilot programmes and projects;
- Promote closer policy dialogue among partners and work to raise global public awareness of the challenges and opportunities;
- Examine inputs from the private sector and other interested groups such as the Global Digital Divide Initiative's contributions;
- Report its findings and activities to our personal representatives before our next meeting in Genoa.

19. In pursuit of these objectives, the *dot force* will look for ways to take concrete steps on the priorities identified below:

Fostering policy, regulatory and network readiness

- supporting policy advice and local capacity building, to promote a pro-competitive, flexible and socially inclusive policy and regulatory environment;
- facilitating the sharing of experience between developing countries and other partners;

- encouraging more effective and greater utilisation of *IT* in development efforts encompassing such broad areas as poverty reduction, education, public health, and culture;
- promoting good governance, including exploration of new methods of inclusive policy development;
- supporting efforts of MDBs and other international organisations to pool intellectual and financial resources in the context of co-operation programmes such as *InfoDev*;

Improving connectivity, increasing access and lowering cost:

- mobilising resources to improve information and communications infrastructure, with a particular emphasis on a “partnership” approach involving governments, international organisations, the private sector, and NGOs;
- working on ways to reduce the cost of connectivity for developing countries;
- supporting community access programmes;
- encouraging research and development on technology and applications adapted to specific requirements in developing countries;
- improving interoperability of networks, services, and applications;
- encouraging the production of locally relevant and informative content including in the development of the content in various mother tongues.

Building human capacity:

- focusing on basic education as well as increased opportunities for life-long learning, with a particular emphasis on development of *IT* skills;
- assisting the development of a pool of trained professionals in *IT* and other relevant policy areas and regulatory matters;
- developing innovative approaches to extend the traditional reach of technical assistance, including distance learning and community-based training;
- networking of public institutions and communities, including schools, research centres and universities.

Encouraging participation in global e-commerce networks:

- assessing and increasing e-commerce readiness and use, through provision of advice to start-up businesses in developing countries, and through mobilisation of resources to help businesses to use *IT* to improve their efficiency and access to new markets.
- ensuring that the “rules of the game” as they are emerging are consistent with development efforts, and building developing country capacity to play a constructive role in determining these rules.